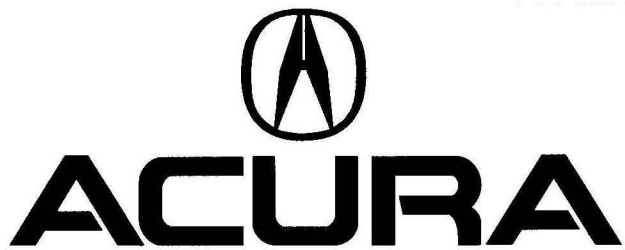
Protected by AR



Service Manual
1999-2003 3.2 TL

Protected by AR

General Information

Chassis and Paint Codes-
1999 Model 1-2

Chassis and Paint Codes-
2000 Model 1-3

Chassis and Paint Codes-
2001 Model 1-4

Chassis and Paint Codes-
2002 Model 1-5

Chassis and Paint Codes-
2003 Model 1-6

Identification Number Locations 1-7

Warning/Caution Label Locations 1-8

Under-hood Emission
Control Label 1-12

Lift and Support Points 1-14

Towing 1-15

Parts Marking 1-16

Revised Component Terms 1-17

Protected by AR

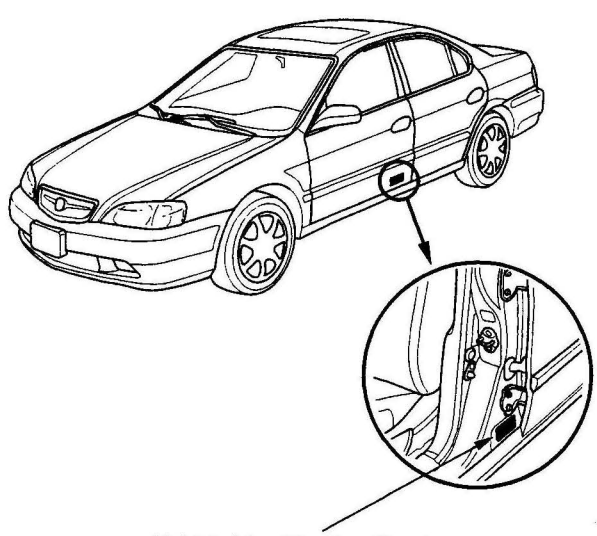
Chassis and Paint Codes - 1999 Model

Vehicle Identification Number

19U UA5 6 4 * X A 000001

a b c d e f g h

a. Manufacturer, Make and Type of Vehicle
19U: HONDA OF AMERICA MFG., INC., U.S.A.
ACURA Passenger vehicle
b. Line, Body and Engine Type
UA5: ACURA 3.2TL/J32A1
c. Body Type and Transmission Type
6: 4-door Sedan/4-speed Automatic
d. Vehicle Grade (Series)
US model
4: Base Package
5: With Navigation System
Canada model
4: Base Package
e. Check Digit
f. Model Year
X: 1999
g. Factory Code
A: Marysville, Ohio Factory in U.S.A.
h. Serial Number
US model: 000001–
Canada model: 800001–



Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.

Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.

Engine Number

J32A1 - 1000001

a b

a. Engine Type
J32A1: 3.2 ℓ SOHC VTEC Sequential Multiport Fuel-injected engine
b. Serial Number

Transmission Number

B7VA - 6500001

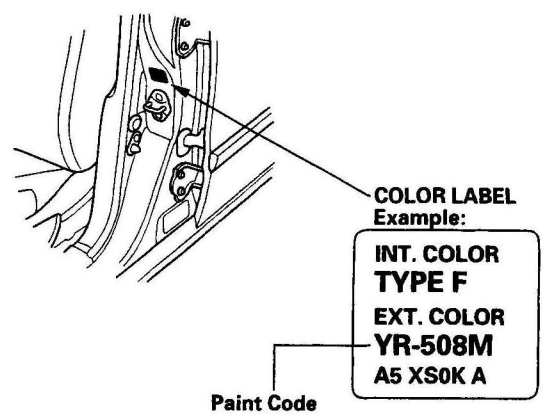
a b

a. Transmission Type
B7VA: 4-speed Automatic
b. Serial Number

Paint Code

Code	Color	US model	Canada model
B-93P	Monterey Blue Pearl	○	○
G-87P	Dark Emerald Pearl	○	○
G-91M	Laguna Metallic	○	○
NH-578	Taffeta White	○	○
NH-592	Flamenco Black Pearl	○	○
NH-603P	White Diamond Pearl	○	○
NH-623M	Satin Silver Metallic	○	○
R-507P	Firepepper Pearl	○	○
YR-508M	Heather Mist Metallic	○	○

○: indicates applicable



BACK

Protected by AR

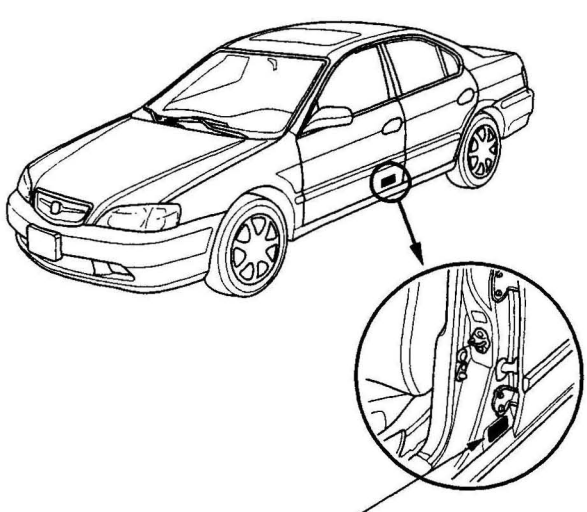
Chassis and Paint Codes - 2000 Model

Vehicle Identification Number

19U UA5 6 4 * Y A 000001

a b c d e f g h

a. Manufacturer, Make and Type of Vehicle
19U: HONDA OF AMERICA MFG., INC., U.S.A.
ACURA Passenger vehicle
b. Line, Body and Engine Type
UA5: ACURA 3.2TL/J32A1
c. Body Type and Transmission Type
6: 4-door Sedan/5-speed Automatic
d. Vehicle Grade (Series)
US model
4: Base Package
5: With Navigation System
Canada model
4: Base Package
e. Check Digit
f. Model Year
Y: 2000
g. Factory Code
A: Marysville, Ohio Factory in U.S.A.
h. Serial Number
US model: 000001–
Canada model: 800001–



Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.

Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.

Engine Number

J32A1 - 2000001

a b

a. Engine Type
J32A1: 3.2 ℓ SOHC VTEC Sequential Multiport Fuel-injected engine
b. Serial Number

Transmission Number

M7WA - 1000001

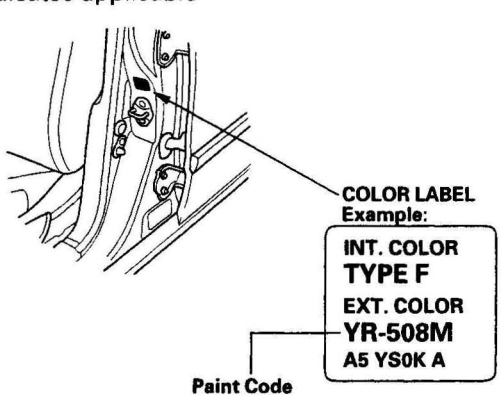
a b

a. Transmission Type
M7WA: 5-speed Automatic
b. Serial Number

Paint Code

Code	Color	US model	Canada model
B-92P	Nighthawk Black Pearl	○	○
B-93P	Monterey Blue Pearl	○	○
G-87P	Dark Emerald Pearl	○	
G-91M	Laguna Metallic	○	○
NH-578	Taffeta White	○	
NH-603P	White Diamond Pearl	○	○
NH-623M	Satin Silver Metallic	○	○
R-507P	Firepepper Pearl	○	○
YR-524M	Naples Gold Metallic	○	○

○: indicates applicable



BACK

Protected by AR

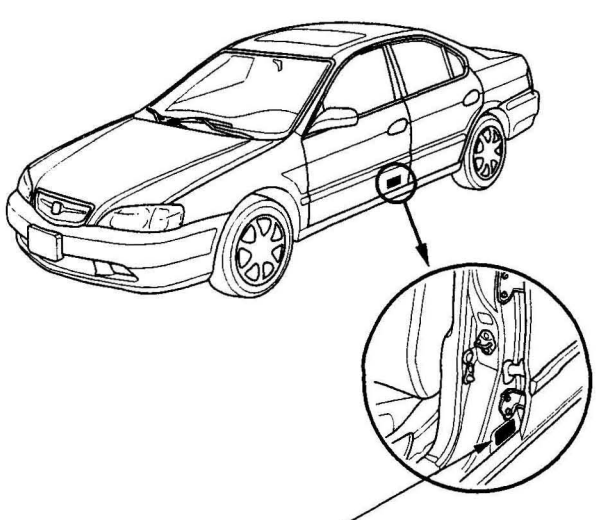
Chassis and Paint Codes - 2001 Model

Vehicle Identification Number

19U UA5 6 6 * 1 A 000001

a b c d e f g h

- **a. Manufacturer, Make and Type of Vehicle**
  19U: HONDA OF AMERICA MFG., INC., U.S.A.
  ACURA Passenger vehicle
- **b. Line, Body and Engine Type**
  UA5: ACURA 3.2TL/J32A1
- **c. Body Type and Transmission Type**
  6: 4-door Sedan/5-speed Automatic
- **d. Vehicle Grade (Series)**
  US model
  6: With Sunroof
  7: With Navigation System
  Canada model
  6: With Sunroof
- **e. Check Digit**
- **f. Model Year**
  1: 2001
- **g. Factory Code**
  A: Marysville, Ohio Factory in U.S.A.
- **h. Serial Number**
  US model: 000001–
  Canada model: 800001–



Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.

Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.

Engine Number

J32A1 - 3400001

a b

- **a. Engine Type**
  J32A1: 3.2 ℓ SOHC VTEC Sequential Multiport Fuel-injected engine
- **b. Serial Number**

Transmission Number

B7WA - 8000001

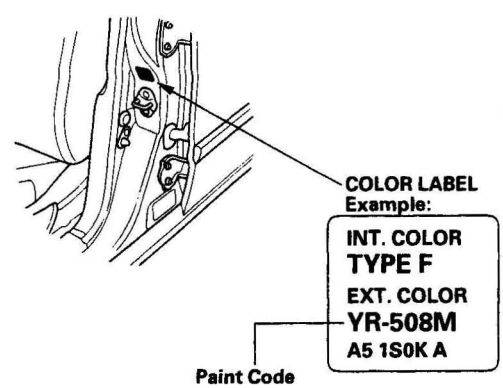
a b

- **a. Transmission Type**
  B7WA: 5-speed Automatic
- **b. Serial Number**

Paint Code

Code	Color	US model	Canada model
B-92P	Nighthawk Black Pearl	○	○
B-93P	Monterey Blue Pearl	○	○
G-87P	Dark Emerald Pearl	○	
G-91M	Laguna Metallic	○	○
NH-578	Taffeta White	○	
NH-603P	White Diamond Pearl	○	○
NH-623M	Satin Silver Metallic	○	○
R-507P	Firepepper Pearl	○	○
YR-524M	Naples Gold Metallic	○	○

○: indicates applicable



BACK

Protected by AR

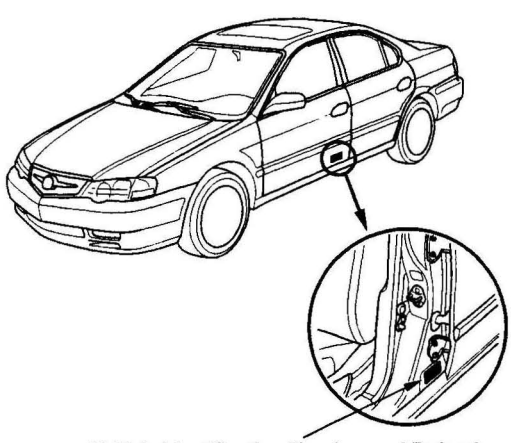
Chassis and Paint Codes - 2002 Model

Vehicle Identification Number

19U UA5 6 6 * 2 A 000001

a b c d e f g h

a. Manufacturer, Make and Type of Vehicle
19U: HONDA OF AMERICA MFG., INC., U.S.A.
ACURA Passenger vehicle
b. Line, Body and Engine Type
UA5: ACURA 3.2TL/J32A1, J32A2
c. Body Type and Transmission Type
6: 4-door Sedan/5-speed Automatic
d. Vehicle Grade (Series)
US model
6: Premium with sunroof
7: Premium with Navigation System
8: Type-S
9: Type-S with Navigation System
Canada model
6: Premium
8: Type-S
e. Check Digit
f. Model Year
2: 2002
g. Factory Code
A: Marysville, Ohio Factory in U.S.A.
h. Serial Number
US model: 000001–
Canada model: 800001–



Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.
Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.

Engine Number

J32A1 - 4400001

a b

a. Engine Type
J32A1: 3.2 ℓ SOHC VTEC Sequential Multiport Fuel-injected, 225HP engine
J32A2: 3.2 ℓ SOHC VTEC Sequential Multiport Fuel-injected, 260HP engine
b. Serial Number
J32A1: 4400001–
J32A2: 1300001–

Transmission Number

B7WA - 9000001

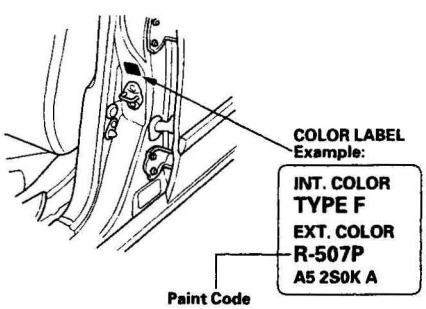
a b

a. Transmission Type
B7WA: 5-speed Automatic
b. Serial Number

Paint Code

Code	Color	US model		Canada model	
		Premium	Type-S	Premium	Type-S
B-92P	Nighthawk Black Pearl	○	○	○	○
B-96P	Eternal Blue Pearl				○
B-504P	Aegean Blue Pearl		○		
G-87P	Dark Emerald Pearl		○		
G-508P	Noble Green Pearl	○	○	○	○
NH-603P	White Diamond Pearl	○	○		○
NH-623M	Satin Silver Metallic	○	○	○	○
NH-643M	Anthracite Metallic	○		○	
R-507P	Firepepper Pearl	○		○	
YR-524M	Naples Gold Metallic	○		○	○

○: indicates applicable.



BACK

Protected by AR

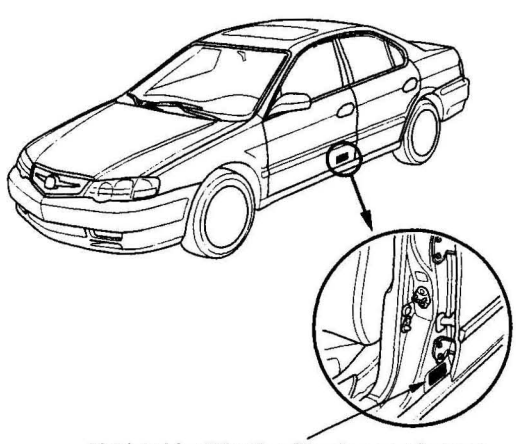
Chassis and Paint Codes - 2003 Model

Vehicle Identification Number

19U UA5 6 6 * 3 A 000001

a b c d e f g h

a. **Manufacturer, Make and Type of Vehicle**
19U: HONDA OF AMERICA MFG., INC., U.S.A.
ACURA Passenger vehicle
b. **Line, Body and Engine Type**
UA5: ACURA 3.2TL/J32A1, J32A2
c. **Body Type and Transmission Type**
6: 4-door Sedan/5-speed Automatic
d. **Vehicle Grade (Series)**
US model
6: Premium with sunroof
7: Premium with Navigation System
8: Type-S
9: Type-S with Navigation System
Canada model
6: Premium
8: Type-S
e. **Check Digit**
f. **Model Year**
3: 2003
g. **Factory Code**
A: Marysville, Ohio Factory in U.S.A.
h. **Serial Number**
US model: 000001–
Canada model: 800001–



Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.
Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.

Engine Number

J32A1 - 5400001

a b

a. **Engine Type**
J32A1: 3.2 ℓ SOHC VTEC Sequential Multiport Fuel-injected, 225HP engine
J32A2: 3.2 ℓ SOHC VTEC Sequential Multiport Fuel-injected, 260HP engine
b. **Serial Number**
J32A1: 5400001–
J32A2: 2300001–

Transmission Number

B7WA - 5000001

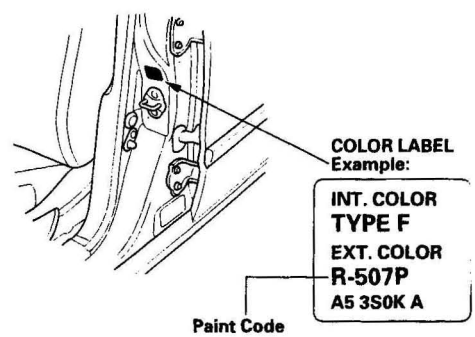
a b

a. **Transmission Type**
B7WA: 5-speed Automatic
b. **Serial Number**

Paint Code

Code	Color	US model		Canada model	
		Premium	Type-S	Premium	Type-S
B-92P	Nighthawk Black Pearl	○	○	○	○
B-96P	Eternal Blue Pearl	○			○
B-504P	Aegean Blue Pearl		○		
G-508P	Noble Green Pearl		○		
NH-603P	White Diamond Pearl	○	○		○
NH-623M	Satin Silver Metallic	○	○	○	○
NH-643M	Anthracite Metallic	○	○	○	○
R-507P	Firepepper Pearl	○		○	
YR-524M	Naples Gold Metallic	○		○	○

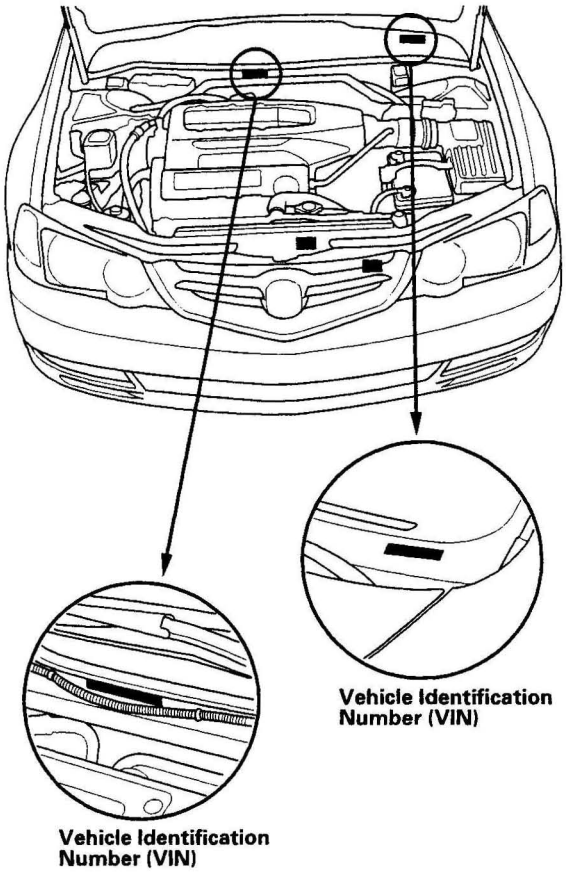
○: indicates applicable.

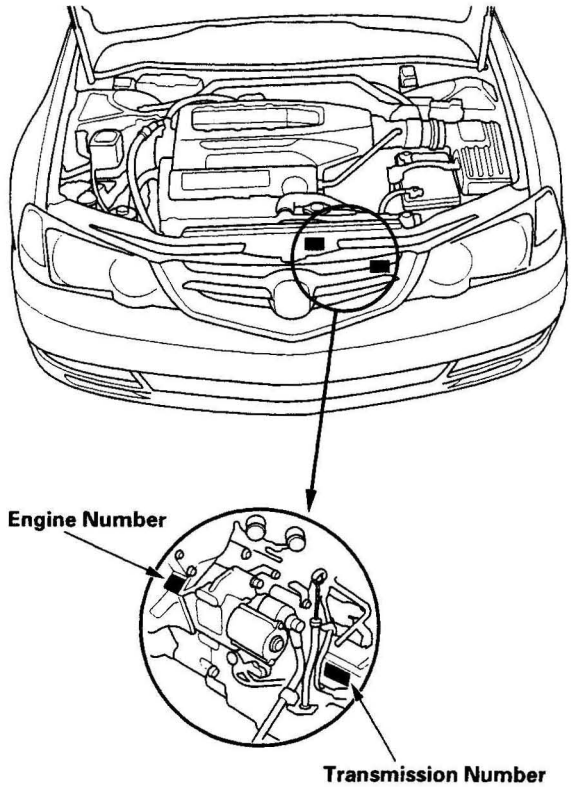


BACK

Protected by AR

Identification Number Locations

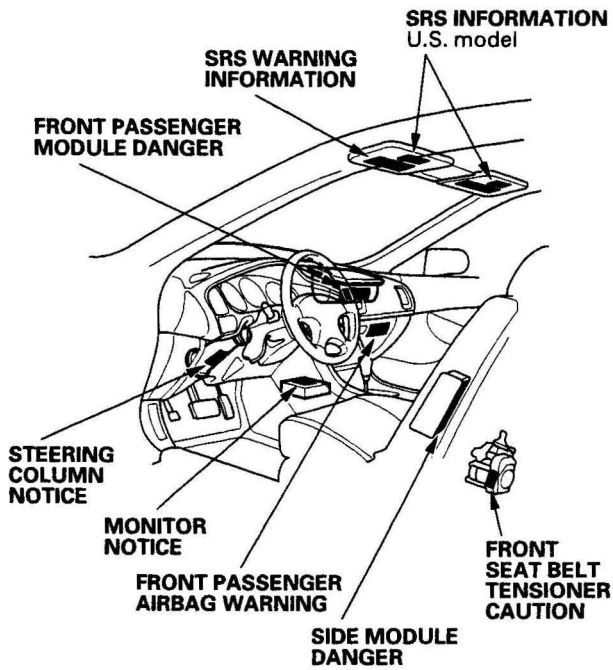


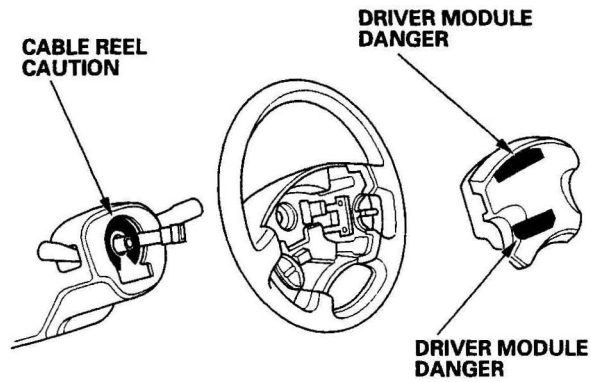


BACK

Protected by AR

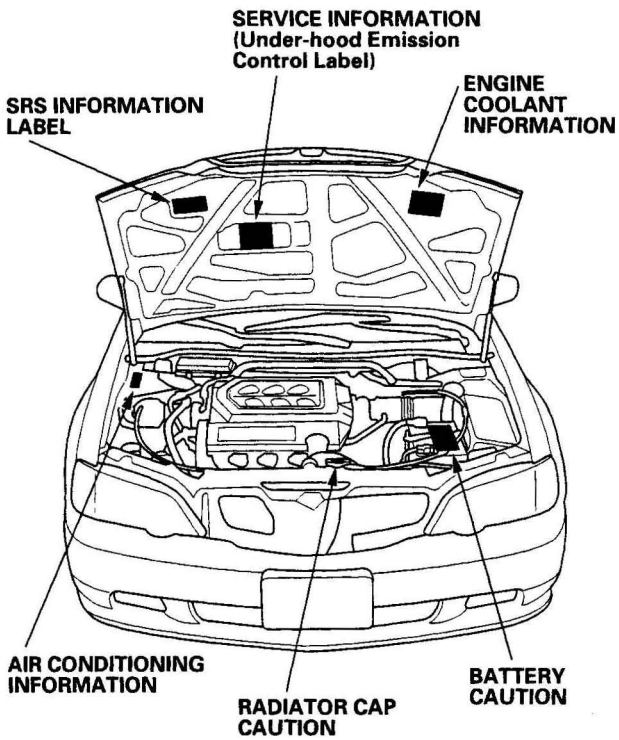
Warning/Caution Label Locations

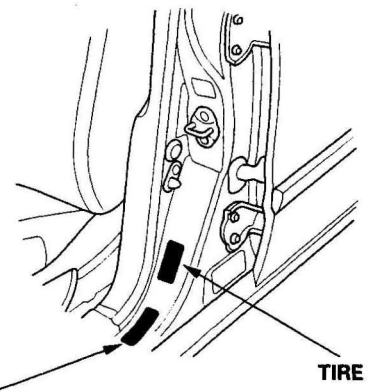




BACK

Protected by AR





SIDE AIRBAG INFORMATION
- **Located on driver's doorjamb and passenger's doorjamb (not shown)**

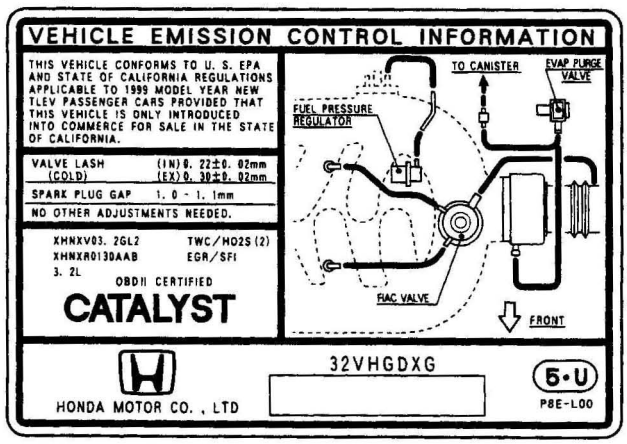
BACK

Protected by AR

Under-hood Emission Control Label (1999 Model)

Emission Group Identification

Example:



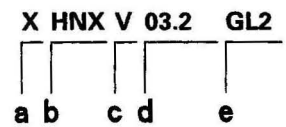
FEDERAL
THIS VEHICLE CONFORMS TO U.S. EPA REGULATIONS APPLICABLE TO 1999 MODEL YEAR NEW MOTOR VEHICLES.

CALIFORNIA TLEV
THIS VEHICLE CONFORMS TO CALIFORNIA REGULATIONS APPLICABLE TO 1999 MODEL YEAR NEW TLEV PASSENGER CARS AND TO U. S. EPA NLEV PROGRAM REGULATIONS APPLI CABLE TO 1999 MODEL YEAR NEW TLEV PASSENGER CARS. THIS VEHICLE MAY ONLY BE INTRODUCED INTO COMMERCE FOR SALE IN CALIFORNIA. A STATE THAT HAS THE CALIFORNIA STANDARDS IN EFFECT TO WHICH THIS VEHICLE HAS BEEN CERTIFIED. A STATE THAT HAS OPTED INTO THE NLEV PROGRAM, OR A STATE CONTIGUOUS THERETO.

TIER 1
THIS VEHICLE CONFORMS TO U.S. EPA REGULATIONS APPLICABLE TO 1999 MODEL YEAR NEW PASSENGER CARS.

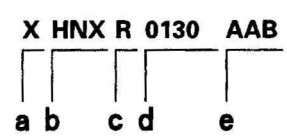
Engine and Evaporative Families:

Engine Family:



- **a. Model Year**
  X: 1999
- **b. Manufacturer Subcode**
  HNX: HONDA
- **c. Family Type**
  V: LDV
- **d. Displacement**
- **e. Sequence Characters**
  GF1: Federal and Tier 1
  GL2: California TLEV

Evaporative Family:



- **a. Model Year**
  X: 1999
- **b. Manufacturer Subcode**
  HNX: HONDA
- **c. Family Type**
  R: EVAP/ORVR
- **d. Canister Work Capacity**
- **e. Sequence Characters**

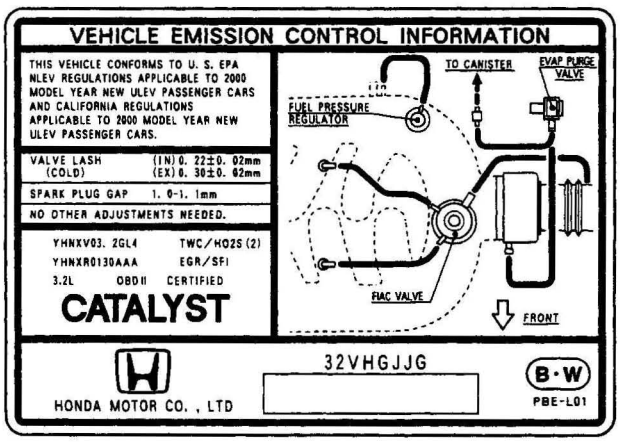
BACK

Protected by AR

Under-hood Emission Control Label (2000 and 2001 Models)

Emission Group Identification

Example:



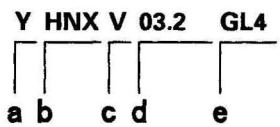
FEDERAL LEV
THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS APPLICABLE TO 2000, 2001 MODEL YEAR NEW LEV PASSENGER CARS.

CALIFORNIA ULEV
THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS APPLICABLE TO 2000, 2001 MODEL YEAR NEW ULEV PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2000, 2001 MODEL YEAR NEW ULEV PASSENGER CARS.

CANADIAN TIER 1
THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS AND CANADIAN TIER 1 STANDARDS FOR 2000, 2001 MODEL YEAR NEW PASSENGER CARS.

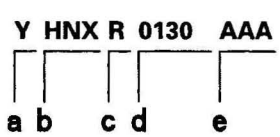
Engine and Evaporative Families:

Engine Family:



a. **Model Year**
   Y: 2000, 2001
b. **Manufacturer Subcode**
   HNX: HONDA
c. **Family Type**
   V: LDV
d. **Displacement**
e. **Sequence Characters**
   GF3: Federal LEV and Canadian Tier 1
   GL4: California ULEV

Evaporative Family:



a. **Model Year**
   Y: 2000, 2001
b. **Manufacturer Subcode**
   HNX: HONDA
c. **Family Type**
   R: EVAP/ORVR
d. **Canister Work Capacity**
e. **Sequence Characters**

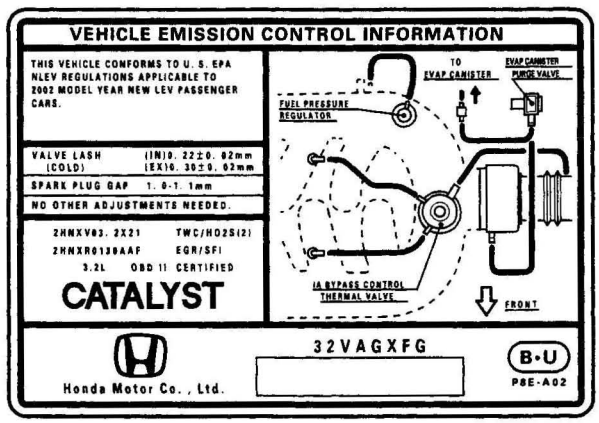
BACK

Protected by AR

Under-hood Emission Control Label (2002 Model)

Emission Group Identification

Example:



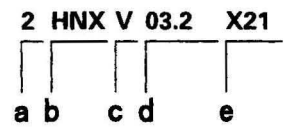
FEDERAL LEV and CANADIAN TIER 1
THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS APPLICABLE TO 2002 MODEL YEAR NEW LEV PASSENGER CARS.

CALIFORNIA LEV
THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS APPLICABLE TO 2002 MODEL YEAR NEW LEV PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2002 MODEL YEAR NEW LEV PASSENGER CARS.

CALIFORNIA ULEV
THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS APPLICABLE TO 2002 MODEL YEAR NEW ULEV PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2002 MODEL YEAR NEW ULEV PASSENGER CARS.

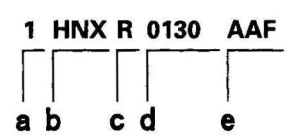
Engine and Evaporative Families:

Engine Family:



- **a. Model Year**
  2: 2002
- **b. Manufacturer Subcode**
  HNX: HONDA
- **c. Family Type**
  V: LDV
- **d. Displacement**
- **e. Sequence Characters**
  X21: Federal LEV, Canadian Tier 1 and California LEV
  HYT: California ULEV

Evaporative Family:



- **a. Model Year**
  2: 2002
- **b. Manufacturer Subcode**
  HNX: HONDA
- **c. Family Type**
  R: EVAP/ORVR
- **d. Canister Work Capacity**
- **e. Sequence Characters**

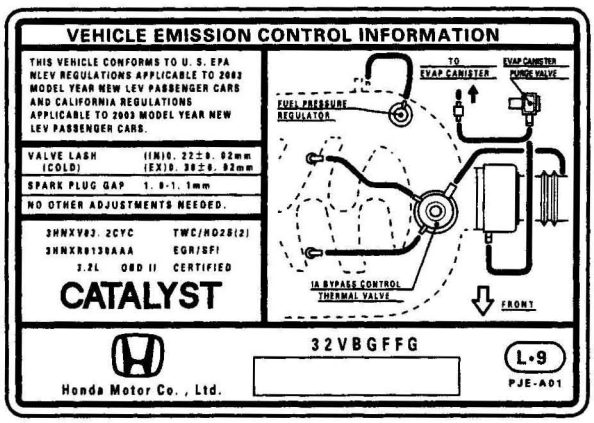
BACK

Protected by AR

Under-hood Emission Control Label (2003 Model)

Emission Group Identification

Example:



FEDERAL and CANADIAN TIER 1
THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS APPLICABLE TO 2003 MODEL YEAR NEW LEV PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2003 MODEL YEAR NEW LEV PASSENGER CARS.

CALIFORNIA ULEV
THIS VEHICLE CONFORMS TO U.S. EPA NLEV REGULATIONS APPLICABLE TO 2003 MODEL YEAR NEW ULEV PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2003 MODEL YEAR NEW ULEV PASSENGER CARS.

Engine and Evaporative Families:

Engine Family:

3 HNX V 03.2 CYC
a b c d e

a. **Model Year**
3: 2003
b. **Manufacturer Subcode**
HNX: HONDA
c. **Family Type**
V: LDV
d. **Displacement**
e. **Sequence Characters**
AYC: Federal and Canadian Tier 1 (J32A1)
CYC: Federal and Canadian Tier 1 (J32A2)
BYT: California ULEV

Evaporative Family:

3 HNX R 0130 AAA
a b c d e

a. **Model Year**
3: 2003
b. **Manufacturer Subcode**
HNX: HONDA
c. **Family Type**
R: EVAP/ORVR
d. **Canister Work Capacity**
e. **Sequence Characters**

BACK

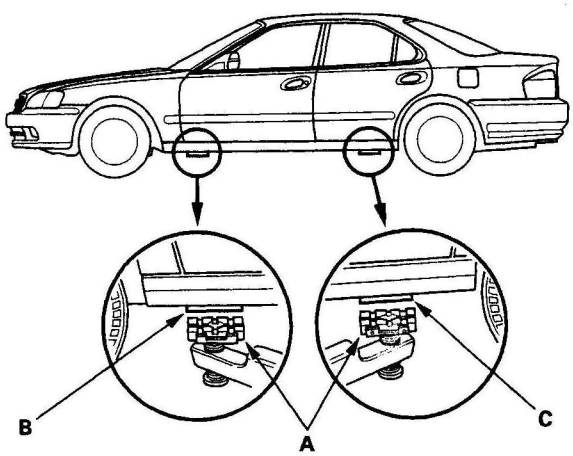
Protected by AR

Lift and Support Points

If you are going to remove heavy components such as suspension or the fuel tank from the rear of the vehicle, first support the front of the vehicle with a tall safety stand. When substantial weight is removed from the rear of the vehicle, the center of gravity can change and cause the vehicle to tip forward on the hoist.

Frame Hoist

1. Position the hoist lift blocks (A), or safety stands, under the vehicle's front support points (B) and rear support points (C).



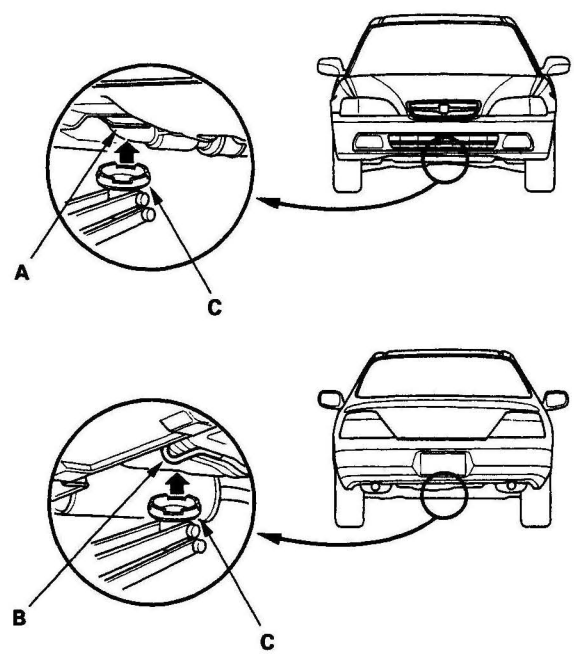
2. Raise the hoist a few inches, and rock the vehicle gently to be sure it is firmly supported.
3. Raise the hoist to full height, and inspect the lift points (B) for solid contact with the lift blocks.

Safety Stands

To support the vehicle on safety stands, use the same support points (B and C) as for a frame hoist. Always use safety stands when working on or under any vehicle that is supported only by a jack.

Floor Jack

1. Set the parking brake.
2. Block the wheels that are not being lifted.
3. When lifting the rear of the vehicle, put the gearshift lever in the Park position.
4. Position the floor jack under the front jacking bracket (A) or rear jacking bracket (B), center the jack lift platform (C) on the jacking bracket, and jack up the vehicle high enough to fit the safety stands under it.



5. Position the safety stands under the support points and adjust them so the vehicle will be level.
6. Lower the vehicle onto the stands.

BACK

Protected by AR

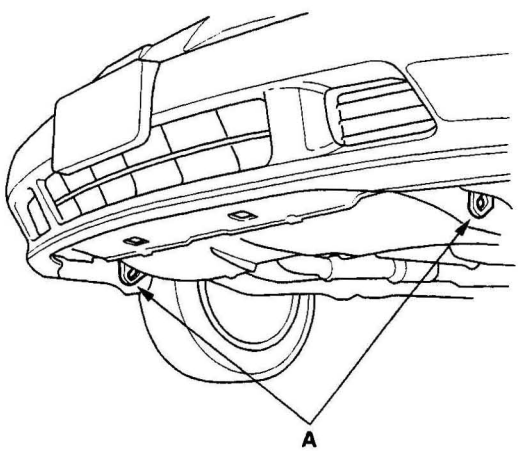
Towing

If the vehicle needs to be towed, call a professional towing service. Never tow the vehicle behind another vehicle with just a rope or chain. It is very dangerous.

There are three popular methods of towing a vehicle.

Flat-bed Equipment— The operator loads the vehicle on the back of a truck. This is the best way of transporting the vehicle.

To accommodate flat-bed equipment, the vehicle is equipped with tie down hooks (A).
The tie down hooks can be used to secure the vehicle to the truck.



Wheel Lift Equipment— The tow truck uses two pivoting arms that go under the tires (front or rear) and lift them off the ground. The other two wheels remain on the ground.

Sling-type Equipment— The tow truck uses metal cables with hooks on the ends. These hooks go around parts of the frame or suspension and the cables lift that end of the vehicle off the ground. The vehicle's suspension and body can be seriously damaged. This method of towing is unacceptable.

If the vehicle cannot be transported by flat-bed, it should be towed with the front wheels off the ground. If due to damage, the vehicle must be towed with the front wheels on the ground, do the following:

- Release the parking brake.
- Start the engine.
- Shift to D4 position for 1999 model, D5 position for 2000-2003 models, position, then N position.
- Turn off the engine.

It is best to tow the vehicle no farther than 50 miles (80 km), and keep the speed below 35 mph (55 km/h).

NOTICE

- Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you cannot shift the transmission or start the engine , the vehicle must be transported on a flat-bed.
- Trying to lift or tow the vehicle by the bumpers will cause serious damage. The bumpers are not designed to support the vehicle's weight.

BACK

Protected by AR

Parts Marking

To deter vehicle theft, certain major components are marked with the vehicle identification number (VIN). Original parts have self-adhesive labels attached with a break-off bolt. Replacement body parts will have self-adhesive labels, and replacement engine and transmission parts will be stamped with a code for spare parts.

NOTE: Be careful not to damage the parts marking labels during body repair. Mask the labels before repairing the part.

BACK

Protected by AR

Revised Component Terms

Beginning with '01 models, the following component terms have been changed to conform with the standards in SAE document J1930. If you find a terms or abbreviation in a '01 manual that is unfamiliar to you, check this list. If a term is not listed below, it did not change.

00 and Earlier Models		'01-03 Models	
Description	**HONDA Abbreviations**	**Description**	**New Abbreviations SAE recommendation**
Heated Oxygen Sensor (for some models)	HO2S	Air Fuel Ratio Sensor	A/F SENSOR
Brake Switch		Brake Pedal Position Switch	BPP Switch
Clutch Switch		Clutch Pedal Position Switch	
Distributor Ignition Rotor	DI Rotor	Distributor Rotor	
Function Sensor		Engine Speed Fluctuation Sensor	RPM Fluctuation Sensor
Evaporative Emission Control Canister	EVAP Control Canister	Evaporative Emission Canister	EVAP Canister
Evaporative Emission Control Canister Vent Shut Valve	EVAP Control Canister Vent Shut Valve	Evaporative Emission Canister Vent Shut Valve	EVAP Canister Vent Shut Valve
Evaporative Emission Purge Control Solenoid Valve	EVAP Purge Control Solenoid Valve	Evaporative Emission Canister Purge Valve	EVAP Canister Purge Valve
Exhaust Gas Recirculation Valve Lift Sensor	EGR Valve Lift Sensor	Exhaust Gas Recirculation Valve Position Sensor	EGR Valve Position Sensor
Exhaust Gas Recirculation Control Solenoid Valve	EGR Control Solenoid Valve	Exhaust Gas Recirculation Valve Vacuum Control Solenoid Valve	EGR Valve Vacuum Control Solenoid Valve
Exhaust Gas Recirculation Vacuum Control Valve	EGR Vacuum Control Valve	Exhaust Gas Recirculation Valve Vacuum Control Solenoid Valve	EGR Valve Vacuum Control Solenoid Valve
Radiator Fan Control Module		Fan Control Module	
Fuel Tank Evaporative Emission Valve		Fuel Tank Vapor/Liquid Separation Valve	
ORVR Vent Shut Valve		Fuel Tank Vapor Control Valve	
ORVR Vapor Recirculation Tube		Fuel Tank Vapor Recirculation Tube	
First Idle Themo Valve		Idle Air Control Thermal Valve	IAC Thermal Valve
Fuel Injector		Injector	
Fuel Injection Air Control Valve	FIA Control Valve	Intake Air Bypass Control Valve	
Fuel Injection Air Control Solenoid Valve	FIA Control Solenoid Valve	Intake Air Bypass Control Themal Valve	
Intake Air Bypass Check Valve	IAB Check Valve	Intake Manifold Runner Control Vacuum Check Valve	IMRC Vacuum Check Valve
		Intake Manifold Runner Control Actuator	IMRC Actuator
		Intake Manifold Runner Control Actuator Wire	IMRC Actuator Wire
Intake Air Bypass Control Diaphragm	IAB Control Diaphragm	Intake Manifold Runner Control Actuator Diaphragm	IMRC Diaphragm
		Intake Manifold Runner Control Module	IMRC Module

(cont'd)

BACK

Protected by AR

Revised Component Terms (cont'd)

00 and Earlier Models		'01-03 Models	
Description	HONDA Abbreviations	Description	New Abbreviations SAE recommendation
Intake Air Bypass Control Solenoid Valve	IAB Control Solenoid Valve	Intake Manifold Runner Control Solenoid Valve	IMRC Solenoid Valve
Intake Air Bypass Vacuum Tank	IAB Vacuum Tank	Intake Manifold Runner Control Vacuum	IMRC Vacuum Reservoir
Intake Air Bypass Valve Body Assembly	IAB Valve Body Assembly	Intake Manifold Runner Control Valve	IMRC Valve
Breather Chamber		Oil/Air Separator	
Fuel Pressure Regulator Control Solenoid Valve		Pressure Regulator Vacuum Control Solenoid Valve	
Air Control Valve Check Valve		Secondary Air Injection Control Vacuum Check Valve	Air Control Vacuum Check Valve
Air Control Valve Vacuum Tank		Secondary Air Injection Control Vacuum Reservoir	Air Control Vacuum Reservoir
Air Control Solenoid Valve		Secondary Air Injection Control Vacuum Control Solenoid Valve	Air Control Valve Vacuum Control Solenoid Valve
Air Pump		Secondary Air Injection Pump	Air Pump
Air Control Valve		Secondary Air Injection Pump Control Valve	Air Control Valve
Air Pump Electric Current Sensor		Secondary Air Injection Pump Electric Current Sensor	Air Pump Electric Current Sensor
Shift/Clutch Pressure Control Solenoid Valve Set		Shift Solenoid and Automatic Transaxle Clutch Pressure Control Solenoid Valve Set	SS and A/T Clutch Pressure Control Solenoid Valve Set
Shift Control Solenoid Valve Set		Shift Solenoid and Torque Converter Clutch Solenoid Valve Set	SS and TCC Solenoid Valve Set
Shift/Lock-up Clutch Control Solenoid Valve Assy		Shift Solenoid and Torque Converter Clutch Solenoid Valve	SS and TCC Solenoid Valve
Shift Control Solenoid Valve A		Shift Solenoid Valve A	SS Valve A
Shift Control Solenoid Valve B		Shift Solenoid Valve B	SS Valve B
Throttle Valve Control Module		Throttle Actuator	
Lock-up Clutch Control Solenoid Valve Set		Torque Converter Clutch Solenoid and Automatic Transaxle Clutch Pressure Control Solenoid Valve Set	TCC solenoid and A/T Clutch Pressure Control Solenoid Valve Set
Lock-up Clutch Control Solenoid Valve		Torque Converter Clutch Solenoid Valve	TCC solenoid Valve
Automatic Transaxle Position Switch	A/T Gear Position Switch	Transmission Range Switch	TR Switch
Variable Valve Timing and Valve Lift Electronic Control Pressure Switch	VTEC Pressure Switch	Variable Valve Timing and Valve lift Electronic Control Pressure Switch	VTEC Oil Pressure Switch

BACK

Protected by AR

Specifications

Standards and Service Limits

Engine Electrical 2-2
Engine Assembly 2-2
Cylinder Head 2-3
Engine Block 2-4
Engine Lubrication 2-5
Cooling 2-5
Fuel and Emissions 2-5
4-speed Automatic Transmission and A/T Differential 2-6
5-speed Automatic Transmission and A/T Differential 2-13
Steering 2-20
Suspension 2-20
Brakes 2-21
Air Conditioning 2-21

Design Specifications

Dimensions 2-22
Weight (U.S.A.) 2-22
Weight (CANADA) 2-22
Engine 2-22
Starter 2-22
4-speed Automatic Transmission 2-22
5-speed Automatic Transmission 2-23
Steering 2-23
Suspension 2-23
Wheel Alignment 2-23
Brakes 2-23
Tires 2-23
Air Conditioning 2-24
Electrical Ratings 2-24

Body Specifications

Illustration 2-25

Protected by AR

Standards and Service Limits

Engine Electrical

Item	Measurement	Qualification	Standard or New	Service Limit
Ignition coil	Rated voltage		12 V	
	Firing order		1−4−2−5−3−6	
Spark plug	Type	J32A1 engine	NGK: PZFR5F-11 DENSO: PKJ16CR-L11	
		J32A2 engine	NGK: PZFR6E-11 DENSO: PKJ20CR-M11	
	Gap		1.0−1.1 mm (0.039−0.043 in.)	1.3 mm (0.051 in.)
Ignition timing		At idle (check the *red* mark)	A/T (in N or P): 10±2°BTDC at 680±50 rpm	
Alternator-compressor belt	Tension adjustment		Auto adjuster type	
Alternator	Output at 13.5 V and normal engine temperature	J32A1 engine	105 A	
		J32A2 engine	120 A	
	Coil (rotor) resistance	at 68°F (20°C)	2.9 kΩ	
	Slip ring O.D.		14.4 mm (0.57 in.)	14.0 mm (0.55 in.)
	Brush length		10.5 mm (0.41 in.)	1.5 mm (0.06 in.)
	Brush spring tension		3.2 N (0.33 kgf, 0.73 lbs)	
Starter	Output		1.6 kW	
	Commutator mica depth		0.4−0.5 mm (0.016−0.020 in.)	0.15 mm (0.006 in.)
	Commutator runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
	Commutator O.D.		28.0−28.1 mm (1.102−1.106 in.)	27.5 mm (1.083 in.)
	Brush length		15.8−16.2 mm (0.62−0.64 in.)	11.0 mm (0.43 in.)
	Brush spring tension (new)		15.7−17.7 N (1.60−1.80 kgf, 3.53−3.97 lbs)	

Engine Assembly

Item	Measurement	Qualification	Standard or New	Service Limit
Compression	Pressure Check at 200 rpm with wide open throttle. (See Design Specs for ratio.)	Minimum	930 kPa (9.5 kgf/cm², 135 psi)	——
		Maximum variation	200 kPa (2.0 kgf/cm², 28 psi)	——

BACK

Protected by AR

Cylinder Head

Item	Measurement	Qualification	Standard or New	Service Limit
Head	Warpage		———	0.05 mm (0.002 in.)
	Height		120.95—121.05 mm (4.762—4.766 in.)	———
Camshaft	End play		0.05—0.20 mm (0.002—0.008 in.)	0.20 mm (0.008 in.)
	Camshaft-to-holder oil clearance		0.050—0.089 mm (0.0020—0.0035 in.)	0.15 mm (0.006 in.)
	Total runout		0.03 mm (0.001 in.) max.	0.04 mm (0.002 in.)
	Cam lobe height J32A1 engine ('99 model)	Intake, primary	34.615 mm (1.3628 in.)	———
		Intake, mid	36.272 mm (1.4280 in.)	———
		Intake, secondary	31.188 mm (1.2279 in.)	———
		Exhaust	36.076 mm (1.4203 in.)	———
	Cam lobe height J32A1 engine ('00-03 models)	Intake, primary	34.737 mm (1.3676 in.)	———
		Intake, mid	36.445 mm (1.4348 in.)	———
		Intake, secondary	34.919 mm (1.3748 in.)	———
		Exhaust	36.326 mm (1.4302 in.)	———
	Cam lobe height J32A2 engine	Intake, primary	34.737 mm (1.3676 in.)	———
		Intake, mid	36.445 mm (1.4348 in.)	———
		Intake, secondary	34.919 mm (1.3748 in.)	———
		Exhaust	36.389 mm (1.4326 in.)	———
Valves	Clearance (cold)	Intake	0.20—0.24 mm (0.008—0.009 in.)	———
		Exhaust	0.28—0.32 mm (0.011—0.013 in.)	———
	Stem O.D.	Intake	5.485—5.495 mm (0.2159—0.2163 in.)	5.455 mm (0.2148 in.)
		Exhaust	5.450—5.460 mm (0.2146—0.2150 in.)	5.420 mm (0.2134 in.)
	Stem-to-guide clearance	Intake	0.020—0.045 mm (0.0008—0.0018 in.)	0.08 mm (0.003 in.)
		Exhaust	0.055—0.080 mm (0.0022—0.0031 in.)	0.12 mm (0.005 in.)
Valve seats	Width	Intake	1.25—1.55 mm (0.049—0.061 in.)	2.00 mm (0.079 in.)
		Exhaust	1.25—1.55 mm (0.049—0.061 in.)	2.00 mm (0.079 in.)
	Stem installed height	Intake	46.75—47.55 mm (1.841—1.872 in.)	47.80 mm (1.882 in.)
		Exhaust	46.68—47.48 mm (1.838—1.869 in.)	47.73 mm (1.879 in.)
	Free length '99-01 models	Intake	51.03 mm (2.009 in.)	———
		Exhaust	53.48 mm (2.106 in.)	———
Valve springs	Free length '02-03 models	Intake	51.54 mm (2.029 in.)	———
		Exhaust	51.06 mm (2.010 in.)	———
Valve guides	I.D.	Intake	5.515—5.530 mm (0.2171—0.2177 in.)	5.55 mm (0.219 in.)
		Exhaust	5.515—5.530 mm (0.2171—0.2177 in.)	5.55 mm (0.219 in.)
	Installed height	Intake	21.20—22.20 mm (0.835—0.874 in.)	———
		Exhaust	20.63—21.63 mm (0.812—0.852 in.)	———
Rocker arms	Arm-to-shaft clearance	Intake	0.026—0.067 mm (0.0010—0.0026 in.)	0.067 mm (0.0026 in.)
		Exhaust	0.026—0.077 mm (0.0010—0.0030 in.)	0.077 mm (0.0030 in.)

BACK

Protected by AR

Standards and Service Limits

Engine Block

Item	Measurement	Qualification	Standard or New	Service Limit
Block	Warpage of deck		0.07 mm (0.003 in.) max.	0.10 mm (0.004 in.)
	Bore diameter		89.000−89.015 mm (3.5039−3.5045 in.)	89.065 mm (3.5065 in.)
	Bore taper		———	0.05 mm (0.002 in.)
	Reboring limit		———	0.5 mm (0.02 in.)
Piston	Skirt O.D. at 16.0 mm (0.63 in.) from bottom of skirt		88.975−88.985 mm (3.5029−3.5033 in.)	88.965 mm (3.5026 in.)
	Clearance in cylinder		0.015−0.040 mm (0.0006−0.0016 in.)	0.08 mm (0.003 in.)
	Ring groove width	Top (J32A1 engine)	1.220−1.230 mm (0.0480−0.0484 in.)	1.25 mm (0.049 in.)
		Top (J32A2 engine)	1.240−1.250 mm (0.0488−0.0492 in.)	1.27 mm (0.050 in.)
		Second	1.220−1.230 mm (0.0480−0.0484 in.)	1.25 mm (0.049 in.)
		Oil	2.805−2.825 mm (0.1104−0.1112 in.)	2.85 mm (0.112 in.
Piston rings	Ring-to-groove clearance	Top (J32A1 engine)	0.035−0.060 mm (0.0014−0.0024 in.)	0.13 mm (0.005 in.
		Top (J32A2 engine)	0.055−0.080 mm (0.0022−0.0031 in.)	0.13 mm (0.005 in.)
		Second	0.030−0.055 mm (0.0012−0.0022 in.)	0.13 mm (0.005 in.)
	Ring end gap	Top	0.20−0.35 mm (0.008−0.014 in.)	0.60 mm (0.024 in.)
		Second	0.40−0.55 mm (0.016−0.022 in.)	0.70 mm (0.028 in.)
		Oil	0.20−0.70 mm (0.008−0.028 in.)	0.80 mm (0.031 in.)
Piston pin	O.D.		21.962−21.965 mm (0.8646−0.8648 in.)	21.954 mm (0.8643 in.)
	Pin-to-piston clearance		−0.0050−+0.0010 mm (−0.00020−+0.00004 in.)	0.004 mm (0.0002 in.)
Connecting rod	Pin-to-rod clearance		0.005−0.014 mm (0.0002−0.0006 in.)	0.019 mm (0.0007 in.)
	Small-end bore diameter		21.970−21.976 mm (0.8650−0.8652 in.)	———
	Large-end bore diameter	Nominal	58.0 mm (2.28 in.)	———
	End play installed on crankshaft		0.15−0.35 mm (0.006−0.014 in.)	0.45 mm (0.018 in.)
Crankshaft	Main journal diameter		71.976−72.000 mm (2.8337−2.8346 in.)	———
	Rod journal diameter		54.976−55.000 mm (2.1644−2.1654 in.)	———
	Rod/main journal taper		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	Rod/main journal out-of-round		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	End play		0.10−0.35 mm (0.004−0.014 in.)	0.45 mm (0.018 in.)
	Runout		0.020 mm (0.0008 in.) max.	0.03 mm (0.0012 in.)
Crankshaft bearings	Main bearing-to-journal oil clearance		0.020−0.044 mm (0.0008−0.0017 in.)	0.050 mm (0.0020 in.)
	Rod bearing clearance		0.020−0.044 mm (0.0008−0.0017 in.)	0.050 mm (0.002 in.)

BACK

Protected by AR

Engine Lubrication

Item	Measurement	Qualification	Standard or New	Service Limit
Engine oil	Capacity		5.0 ℓ (5.3 US qt) for engine overhaul 4.4 ℓ (4.6 US qt) for oil change, including filter 4.0 ℓ (4.2 US qt) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance		0.04 – 0.16 mm (0.002 – 0.006 in.)	0.20 mm (0.008in.)
	Pump housing-to-outer rotor clearance		0.14 – 0.19 mm (0.006 – 0.007 in.)	0.20 mm (0.008 in.)
	Pump housing-to-outer rotor axial clearance		0.02 – 0.07 mm (0.001 – 0.003 in.)	0.12 mm (0.005 in.)
	Oil pressure with oil temperature at 176°F (80°C)	at idle	70 kPa (0.7 kgf/cm², 10 psi)	
		at 3,000 rpm	490 kPa (5.0 kgf/cm², 71 psi)	

Cooling

Item	Measurement	Qualification	Standard or New	Service Limit
Radiator	Coolant capacity (includes engine, heater, hoses and reservoir)	Engine overhaul	7.5 ℓ (7.9 US qt)	
		Coolant change	5.6 ℓ (5.9 US qt)	
Reservoir	Coolant capacity	'99-01 models	0.6 ℓ (0.6 US qt)	
		'02-03 models	0.8 ℓ (0.8 US qt)	
Radiator cap	Opening pressure		93 – 123 kPa (0.95 – 1.25 kgf/cm², 14 – 18 psi)	
Thermostat	Opening temperature	Begins to open: '99 model	163 – 171°F (73 – 77°C)	
		Begins to open: '00-03 models	169 – 176°F (76 – 80°C)	
		Fully open	194°F (90°C)	
	Valve lift at fully open		10.0 mm (0.39 in.) min.	
Radiator fan switch A	Thermoswitch "ON" temperature		196 – 203°F (91 – 95°C)	
	Thermoswitch "OFF" temperature		Subtract 5 – 15°F (3 – 8°C) from actual "ON" temperature	
Radiator fan switch B	Fan timer "ON" temperature		212 – 226°F (100 – 108°C)	
	Fan timer "OFF" temperature		Subtract 5 – 23°F (3 – 13°C) from actual "ON" temperature	
Radiator fan switch C (J32A2 engine)	Thermoswitch "ON" temperature		205 – 216°F (96 – 102°C)	
	Thermoswitch "OFF" temperature		Subtract 5 – 23°F (3 – 13°C) from actual "ON" temperature	

Fuel and Emissions

Item	Measurement	Qualification	Standard or New	Service Limit
Fuel Pressure regulator	Pressure with regulator vacuum hose disconnected	'99-'00 models: through engine number 2057690	280 – 330 kPa (2.9 – 3.4 kgf/cm², 41 – 48 psi)	
		'00 model (engine number 2057691 and later), and '01-'03 models:	330 – 380 kPa (3.4 – 3.9 kgf/cm², 48 – 55 psi)	
Fuel tank	Capacity		65 ℓ (17.1 US gal)	
Engine idle	Idle speed with headlights and radiator fan off	In [N] or [P]	680 ± 50 rpm	
	Idle CO %		0.1 max.	

BACK

Protected by AR

Standards and Service Limits

4-speed Automatic Transmission and A/T Differential

Item	Measurement	Qualification	Standard or New	Service Limit
ATF (Automatic Transmission Fluid)	Capacity	Use Honda ATF-Z1 (ATF)	For fluid change: 2.7 ℓ (2.9 US qt) For overhaul: 7.1 ℓ (7.5 US qt)	
ATF pressure	Line pressure	At 1,500 rpm in [N] or [P] position	800–860 kPa (8.2–8.8 kgf/cm², 120–130 psi)	760 kPa (7.7 kgf/cm², 110 psi)
	4th clutch pressure	At 2,000 rpm in [D4] position	790–870 kPa (8.1–8.9 kgf/cm², 120–130 psi)	750 kPa (7.6 kgf/cm², 110 psi)
	3rd clutch pressure	At 2,000 rpm in [D4] position	790–870 kPa (8.1–8.9 kgf/cm², 120–130 psi)	750 kPa (7.6 kgf/cm², 110 psi)
	2nd clutch pressure	At 1,500 rpm in [2] position	790–870 kPa (8.1–8.9 kgf/cm², 120–130 psi)	750 kPa (7.6 kgf/cm², 110 psi)
	1st clutch pressure	At 1,500 rpm in [1] position	790–870 kPa (8.1–8.9 kgf/cm², 120–130 psi)	750 kPa (7.6 kgf/cm², 110 psi)
Torque converter	Stall speed	Check with vehicle on level ground		2,250–2,550 rpm
Clutches	Clutch end plate-to-top disc clearance	1st		1.2–1.4 mm (0.047–0.055 in.)
		2nd		0.85–1.05 mm (0.033–0.041 in.)
		3rd		0.55–0.75 mm (0.022–0.030 in.)
		4th		0.55–0.75 mm (0.022–0.030 in.)
	Clutch return spring free length	1st	45.7 mm (1.80 in.)	43.7 mm (1.72 in.)
		2nd	63.0 mm (2.48 in.)	61.0 mm (2.40 in.)
		3rd, 4th	33.5 mm (1.32 in.)	31.5 mm (1.24 in.)
	Clutch disc thickness		1.94 mm (0.076 in.)	——
	Clutch plate thickness	1st	2.0 mm (0.079 in.)	When discolored
		2nd	2.0 mm (0.079 in.)	When discolored
		3rd	2.3 mm (0.091 in.)	When discolored
		4th	2.0 mm (0.079 in.)	When discolored
	1st and 2nd clutch end plate thickness	Mark 1	3.10 mm (0.122 in.)	When discolored
		Mark 2	3.20 mm (0.126 in.)	When discolored
		Mark 3	3.30 mm (0.130 in.)	When discolored
		Mark 4	3.40 mm (0.134 in.)	When discolored
		Mark 6	2.60 mm (0.102 in.)	When discolored
		Mark 7	2.70 mm (0.106 in.)	When discolored
		Mark 8	2.80 mm (0.110 in.)	When discolored
		Mark 9	2.90 mm (0.114 in.)	When discolored
		Mark 0	3.00 mm (0.118 in.)	When discolored
	3rd and 4th clutch end plate thickness	Mark 1	2.10 mm (0.083 in.)	When discolored
		Mark 2	2.20 mm (0.087 in.)	When discolored
		Mark 3	2.30 mm (0.091 in.)	When discolored
		Mark 4	2.40 mm (0.094 in.)	When discolored
		Mark 5	2.50 mm (0.098 in.)	When discolored
		Mark 6	2.60 mm (0.102 in.)	When discolored
		Mark 7	2.70 mm (0.106 in.)	When discolored
		Mark 8	2.80 mm (0.110 in.)	When discolored
		Mark 9	2.90 mm (0.114 in.)	When discolored

BACK

Protected by AR

Item	Measurement	Qualification	Standard or New	Service Limit
Valve body	Stator shaft needle bearing contact I.D.	Torque converter side	27.000—27.021 mm (1.0630—1.1638 in.)	When worn or damaged
		ATF pump side	29.000—29.021 mm (1.1417—1.1426 in.)	When worn or damaged
	ATF pump gear thrust clearance		0.03—0.05 mm (0.001—0.002 in.)	0.07 mm (0.003 in.)
	ATF pump gear-to-body clearance	Drive gear	0.210—0.265 mm (0.0083—0.0104 in.)	———
		Driven gear	0.070—0.125 mm (0.0028—0.0049 in.)	———
	ATF pump driven gear I.D.		14.016—14.034 mm (0.5518—0.5525 in.)	When worn or damaged
	ATF pump driven gear shaft O.D.		13.980—13.990 mm (0.5504—0.5508 in.)	When worn or damaged
Reverse shift fork	Fork finger thickness		5.60—6.00 mm (0.220—0.236 in.)	5.40 mm (0.213 in.)
Park gear and pawl				When worn or damaged
Servo body	Shift fork shaft bore I.D.		14.000—14.010 mm (0.5512—0.5516 in.)	———
	Shift fork shaft valve bore I.D.		37.000—37.039 mm (1.4567—1.4582 in.)	37.045 mm (1.4585 in.)
Regulator valve body	Sealing ring contact I.D.		32.000—32.025 mm (1.2598—1.2608 in.)	32.050 mm (1.2618 in.)
Accumulator body	Sealing ring contact I.D.		35.000—35.025 mm (1.3780—1.3789 in.)	35.05 mm (1.3799 in.)
Stator shaft	Sealing ring contact I.D.		29.000—29.013 mm (1.1417—1.1422 in.)	29.050 mm (1.1437 in.)

(cont'd)

BACK

Protected by AR

Standards and Service Limits

4-speed Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Mainshaft	Diameter of needle bearing contact area	at stator shaft	22.984–23.000 mm (0.9049–0.9055 in.)	When worn or damaged
		at 3rd gear	52.975–52.991 mm (2.0856–2.0863 in.)	When worn or damaged
		at 4th gear collar	33.975–33.991 mm (1.3376–1.3382 in.)	When worn or damaged
	I.D. of 3rd gear		59.000–59.019 mm (2.3228–2.3236 in.)	When worn or damaged
	I.D. of 4th gear		40.000–40.016 mm (1.5748–1.5754 in.)	When worn or damaged
	End play of 3rd gear		0.03–0.31 mm (0.001–0.012 in.)	———
	End play of 4th gear		0.10–0.22 mm (0.004–0.009 in.)	———
	41 x 73 mm thrust shim thickness	No. 1	7.85 mm (0.309 in.)	When worn or damaged
		No. 2	7.90 mm (0.311 in.)	When worn or damaged
		No. 3	7.95 mm (0.313 in.)	When worn or damaged
		No. 4	8.00 mm (0.315 in.)	When worn or damaged
		No. 5	8.05 mm (0.317 in.)	When worn or damaged
		No. 6	8.10 mm (0.319 in.)	When worn or damaged
	Thrust washer thickness	27 x 47 x 5 mm	5.00 mm (0.197 in.)	When worn or damaged
	Length of 4th gear collar		58.5–58.6 mm (2.303–2.307 in.)	———
	4th gear collar flange thickness		4.45–4.60 mm (0.175–0.181 in.)	When worn or damaged
	Sealing ring thickness	32 mm sealing ring	1.85–1.95 mm (0.073–0.077 in.)	1.800 mm (0.071 in.)
		29 mm sealing ring	1.85–1.95 mm (0.073–0.077 in.)	1.800 mm (0.071 in.)
	Width of sealing ring groove		2.025 – 2.060 mm (0.080 – 0.081 in.)	2.080 mm (0.082 in.)
	Clutch feed pipe O.D.	3rd clutch	5.97 – 5.98 mm (0.2350 – 0.2354 in.)	5.95 mm (0.2343 in.)
		4th clutch	11.47 – 11.48 mm (0.4516 – 0.4520 in.)	11.45 mm (0.4508 in.)
	Clutch feed pipe bushing I.D.	3rd clutch	6.018 – 6.030 mm (0.2369 – 0.2374 in.)	6.045 mm (0.2380 in.)
		4th clutch	11.500 – 11.518 mm (0.4528 – 0.4535 in.)	11.530 mm (0.4539 in.)

BACK

Protected by AR

Item	Measurement	Qualification	Standard or New	Service Limit
Countershaft	Diameter of needle bearing contact area	at 4th gear	34.975–34.991 mm (1.3770–1.3776 in.)	When worn or damaged
		at 2nd gear	39.979–40.000 mm (1.574–1.575 in.)	When worn or damaged
		at park gear	41.964–41.980 mm (1.6521–1.6528 in.)	When worn or damaged
		at right end	38.505–38.515 mm (1.5159–1.5163 in.)	When worn or damaged
	I.D. of 4th gear		41.000–41.016 mm (1.6142–1.6148 in.)	When worn or damaged
	I.D. of idler gear		50.000–50.016 mm (1.9685–1.9691 in.)	When worn or damaged
	I.D. of reverse gear		46.000–46.016 mm (1.8110–1.8116 in.)	When worn or damaged
	End play of 1st gear		0.00–0.33 mm (0.000–0.013 in.)	———
	End play of 4th gear		0.04–0.27 mm (0.002–0.011 in.)	———
	End play of idler gear		0.015–0.045 mm (0.0006–0.0018 in.)	———
	End play of reverse gear		0.10–0.25 mm (0.004–0.010 in.)	———
	Length of distance collar		53.92–53.96 mm (2.123–2.124 in.)	———
	Cotter thickness		1.99–2.02 mm (0.078–0.080 in.)	———
	Reverse selector hub O.D.		55.87–55.90 mm (2.1996–2.2008 in.)	When worn or damaged

(cont'd)

BACK

Protected by AR

Standards and Service Limits

4-speed Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Secondary shaft	Diameter of needle bearing contact area	at 1st gear	37.97[illegible] 37.993 mm (1.49[illegible] 1.4958 in.)	When worn or damaged
		at 2nd gear	33.986 – 33.999 mm (1.3380 – 1.3385 in.)	When worn or damaged
	I.D. of 1st gear		44.000 – 44.016 mm (1.7323 – 1.7329 in.)	When worn or damaged
	I.D. of 2nd gear		40.000 – 40.016 mm (1.5748 – 1.5754 in.)	When worn or damaged
	End play of 1st gear		0.07 – 0.15 mm (0.003 – 0.006 in.)	———
	End play of 2nd gear		0.04 – 0.12 mm (0.002 – 0.005 in.)	———
	38 x 56.5 mm splined washer thickness	No. 1	6.85 mm (0.270 in.)	When worn or damaged
		No. 2	6.90 mm (0.272 in.)	When worn or damaged
		No. 3	6.95 mm (0.274 in.)	When worn or damaged
		No. 4	7.00 mm (0.276 in.)	When worn or damaged
		No. 5	7.05 mm (0.278 in.)	When worn or damaged
		No. 6	7.10 mm (0.280 in.)	When worn or damaged
	37 x 55 mm thrust shim thickness	No. 1	4.90 mm (0.193 in.)	When worn or damaged
		No. 2	4.95 mm (0.195 in.)	When worn or damaged
		No. 3	5.00 mm (0.197 in.)	When worn or damaged
		No. 4	5.05 mm (0.199 in.)	When worn or damaged
		No. 5	5.10 mm (0.201 in.)	When worn or damaged
		No. 6	5.15 mm (0.203 in.)	When worn or damaged
		No. 7	5.20 mm (0.205 in.)	When worn or damaged
	Cotter thickness		1.99 – 2.02 mm (0.078 – 0.080 in.)	———
	Sealing ring thickness		1.890 – 1.950 mm (0.074 – 0.077 in.)	1.800 mm (0.071 in.)
	Width of sealing ring groove		2.025 – 2.060 mm (0.080 – 0.081 in.)	2.080 mm (0.082 in.)
	Clutch feed pipe O.D.		7.97 – 7.98 mm (0.3138 – 0.3142 in.)	7.95 mm (0.3130 in.)
	Clutch feed pipe bushing I.D.		8.000 – 8.015 mm (0.3150 – 0.3156 in.)	8.030 mm (0.3161 in.)
Reverse idler gear	Diameter of needle bearing contact area	at reverse idler gear shaft	13.990 – 14.000 mm (0.5508 – 0.5512 in.)	When worn or damaged
	End play		0.03 – 0.36 mm (0.001 – 0.014 in.)	———
	I.D.		18.007 – 18.020 mm (0.7089 – 0.7094 in.)	When worn or damaged
	Thrust washer thickness	Transmission housing side	0.97 – 1.03 mm (0.038 – 0.041 in.)	———
		Reverse idler gear shaft holder side	0.97 – 1.03 mm (0.038 – 0.041 in.)	———
	I.D. of reverse idler gear shaft holder		14.006 – 14.024 mm (0.5514 – 0.5521 in.)	When worn or damaged
	I.D. of transmission housing of reverse idler gear shaft contact area		14.006 – 14.024 mm (0.5514 – 0.5521 in,)	———

BACK

Protected by AR

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coils
Main valve body springs (see page 14-171).	Modulator valve spring		1.6 mm (0.063 in.)	10.4 mm (0.409 in.)	33.5 mm (1.319 in.)	9.8
	Shift valve C spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.5 mm (1.949 in.)	21.7
	Shift valve D spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	35.7 mm (1.406 in.)	17.2
	Shift valve E spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in)	7.9
	Relief valve spring		1.1 mm (0.043 in.)	8.6 mm (0.339 in.)	30.1 mm (1.185 in.)	10.7
	Lock-up shift valve spring		0.9 mm (0.035 in.)	7.6 mm (0.299 in.)	63.0 mm (2.480 in.)	22.4
	Cooler check valve spring		0.6 mm (0.024 in.)	5.8 mm (0.228 in.)	14.4 mm (0.567 in.)	6.8
	Torque converter check valve spring		1.2 mm (0.047 in.)	8.6 mm (0.339 in.)	34.4 mm (1.354 in.)	11.7
	Servo control valve spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	35.7 mm (1.406 in.)	17.2
	Reverse CPC valve spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in)	17.8 mm (0.701 in.)	7.9
Regulator valve body springs (see page 14-174).	Stator reaction spring		5.5 mm (0.217 in.)	37.4 mm (1.472 in.)	30.3 mm (1.193 in.)	2.12
	Regulator valve spring A		1.9 mm (0.075 in.)	14.7 mm (0.579 in.)	77.4 mm (3.047 in.)	15.2
	Regulator valve spring B		1.6 mm (0.063 in.)	9.2 mm (0.362 in.)	44.0 mm (1.732 in.)	12.5
	Lock-up control valve spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	44.3 mm (1.744 in.)	25.5
	Lock-up timing valve spring		0.65 mm (0.026 in.)	6.6 mm (0.260 in.)	34.8 mm (1.370 in.)	15.6
Servo body springs (see page 14-175).	Shift valve B spring		0.8 mm (0.031 in.)	7.1 mm (0.280 in.)	40.4 mm (1.591 in.)	16.9
	Shift valve A spring		0.8 mm (0.031 in.)	7.1 mm (0.280 in.)	40.4 mm (1.591 in.)	16.9
	CPC valve A spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	CPC valve B spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	4th accumulator spring A		2.6 mm (0.102 in.)	19.6 mm (0.772 in.)	66.4 mm (2.614 in.)	9.7
	4th accumulator spring B		2.4 mm (0.094 in.)	12.8 mm (0.504 in.)	51.5 mm (2.028 in.)	11.5
	3rd accumulator spring A		2.6 mm (0.102 in.)	19.6 mm (0.772 in.)	66.4 mm (2.614 in.)	9.7
	3rd accumulator spring B		2.4 mm (0.094 in.)	12.8 mm (0.504 in.)	51.5 mm (2.028 in.)	11.5
Accumulator body springs (see page 14-176).	1st accumulator spring B		2.7 mm (0.106 in.)	14.8 mm (0.583 in.)	52.5 mm (2.067 in)	11.3
	1st accumulator spring A		2.6 mm (0.102 in.)	21.6 mm (0.850 in.)	80.5 mm (3.169 in)	11.2
	2nd accumulator spring B		2.4 mm (0.094 in.)	12.6 mm (0.496 in.)	53.5 mm (2.106 in.)	12.9
	2nd accumulator spring A		2.7 mm (0.106 in.)	19.6 mm (0.772 in.)	66.3 mm (2.610 in.)	9.9

(cont'd)

BACK

Protected by AR

Standards and Service Limits

4-speed Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
A/T differential carrier	Pinion shaft contact area I.D.		18.010—18.028 mm (0.7091—0.7098 in.)	——
	Carrier-to-pinion shaft clearance		0.023—0.057 mm (0.001—0.002 in.)	0.1 mm (0.004 in.)
	Driveshaft contact area I.D.		30.025—30.045 mm (1.182—1.183 in.)	——
	Carrier-to-driveshaft clearance		0.045—0.086 mm (0.002—0.003 in.)	0.12 mm (0.005 in)
	Carrier-to-intermediate shaft clearance		0.080—0.116 mm (0.003—0.005 in.)	——
	Tapered roller bearing starting torque (preload)	For new bearing	2.7—3.9 N·m (28—40 kgf·cm, 24—35 lbf·in.)	Adjust
		For used bearing	2.5—3.6 N·m (25—37 kgf·cm, 22—32 lbf·in.)	Adjust
A/T differential pinion gear	Backlash		0.175—0.275 mm (0.007—0.011 in.)	——
	I.D.		18.042—18.066 mm (0.7103—0.7113 in.)	——
	Pinion gear-to-pinion shaft clearance		0.055—0.095 mm (0.0022—0.0037 in.)	0.12 mm (0.005 in)

BACK

Protected by AR

5-speed Automatic Transmission and A/T Differential

Item	Measurement	Qualification	Standard or New	Service Limit
ATF (Automatic Transmission Fluid)	Capacity	Use Honda ATF-Z1 (ATF)	For fluid change: 2.9 ℓ (3.1 US qt) For overhaul: 7.2 ℓ (7.6 US qt)	
ATF pressure	Line pressure	At 2,000 rpm in [N] or [P] position	900–960 kPa (9.2–9.8 kgf/cm², 130–140 psi)	850 kPa (8.7 kgf/cm², 120 psi)
	5th clutch pressure	At 2,000 rpm in [D5] position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	4th clutch pressure	At 2,000 rpm in [D4] position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	3rd clutch pressure	At 2,000 rpm in [D3] position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	2nd clutch pressure	At 2,000 rpm in [2] position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	1st clutch pressure	At 2,000 rpm in [1] position	890–970 kPa (9.1–9.9 kgf/cm², 130–140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	1st-hold clutch pressure	At 2,000 rpm in [1] position	760–830 kPa (7.7–8.5 kgf/cm², 110–120 psi)	710 kPa (7.2 kgf/cm², 100 psi)
Torque converter	Stall speed	Check with vehicle on level ground		2,250–2,550 rpm
Clutches	Clutch end plate-to-top disc clearance	1st		1.1–1.3 mm (0.043–0.051 in.)
		2nd for Premium		0.7–0.9 mm (0.028–0.035 in.)
		2nd for Type-S		0.85–1.05 mm (0.033–0.041 in.)
		3rd		0.7–0.9 mm (0.028–0.035 in.)
		4th, 5th		0.55–0.75 mm (0.022–0.030 in.)
		1st-hold		0.5–0.9 mm (0.020–0.035 in.)
	Clutch return spring free length	1st	68.3 mm (2.69 in.)	66.3 mm (2.61 in.)
		2nd	53.4 mm (2.10 in.)	51.4 mm (2.02 in.)
		3rd	52.0 mm (2.05 in.)	50.0 mm (1.97 in.)
		4th	33.5 mm (1.32 in.)	31.5 mm (1.24 in.)
		5th for Premium	33.5 mm (1.32 in.)	31.5 mm (1.24 in.)
		5th for Type-S	37.4 mm (1.47 in.)	35.4 mm (1.39 in.)
	Clutch disc thickness		1.94 mm (0.076 in.)	———
	Clutch plate thickness	1st, 2nd	1.6 mm (0.063 in.)	When discolored
		3rd, 4th	2.3 mm (0.091 in.)	When discolored
		5th	2.0 mm (0.079 in.)	When discolored
		1st-hold	1.8 mm (0.071 in.)	When discolored

(cont'd)

BACK

Protected by AR

Standards and Service Limits

5-speed Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Clutches	1st clutch end plate thickness	Mark 1	3.10 mm (0.122 in.)	When discolored
		Mark 2	3.20 mm (0.126 in.)	When discolored
		Mark 3	3.30 mm (0.130 in.)	When discolored
		Mark 4	3.40 mm (0.134 in.)	When discolored
		Mark 5	3.50 mm (0.138 in.)	When discolored
		Mark 6	3.60 mm (0.142 in.)	When discolored
		Mark 7	3.70 mm (0.146 in.)	When discolored
		Mark 8	3.80 mm (0.150 in.)	When discolored
		Mark 9	3.90 mm (0.154 in.)	When discolored
	1st-hold clutch end plate thickness		5.00 mm (0.197 in.)	When discolored
	2nd, 3rd, 4th and 5th clutch end plate thickness	Mark 1	2.10 mm (0.083 in.)	When discolored
		Mark 2	2.20 mm (0.087 in.)	When discolored
		Mark 3	2.30 mm (0.091 in.)	When discolored
		Mark 4	2.40 mm (0.094 in.)	When discolored
		Mark 5	2.50 mm (0.098 in.)	When discolored
		Mark 6	2.60 mm (0.102 in.)	When discolored
		Mark 7	2.70 mm (0.106 in.)	When discolored
		Mark 8	2.80 mm (0.110 in.)	When discolored
		Mark 9	2.90 mm (0.114 in.)	When discolored
Valve body	Stator shaft needle bearing contact I.D.	Torque converter side	27.000–27.021 mm (1.0630–1.1638 in.)	When worn or damaged
		ATF pump side	29.000–29.021 mm (1.1417–1.1426 in.)	When worn or damaged
	ATF pump gear thrust clearance		0.03–0.06 mm (0.001–0.002 in.)	0.07 mm (0.003 in.)
	ATF pump gear-to-body clearance	Drive gear	0.210–0.265 mm (0.0083–0.0104 in.)	———
		Driven gear	0.070–0.125 mm (0.0028–0.0049 in.)	———
	ATF pump driven gear I.D.		14.016–14.034 mm (0.5518–0.5525 in.)	When worn or damaged
	ATF pump driven gear shaft O.D.		13.980–13.990 mm (0.5504–0.5508 in.)	When worn or damaged
Reverse shift fork	Fork finger thickness		5.60–6.00 mm (0.220–0.236 in.)	5.40 mm (0.213 in.)
Park gear and pawl				When worn or damaged
Servo body	Shift fork shaft bore I.D.		14.000–14.010 mm (0.5512–0.5516 in.)	———
	Shift fork shaft valve bore I.D.		37.000–37.039 mm (1.4567–1.4582 in.)	37.045 mm (1.4585 in.)
Regulator valve body	Sealing ring contact I.D.		32.000–32.025 mm (1.2598–1.2608 in.)	32.050 mm (1.2618 in.)
Accumulator body	Sealing ring contact I.D.		35.000–35.025 mm (1.3780–1.3789 in.)	35.05 mm (1.3799 in.)
Stator shaft	Sealing ring contact I.D.		29.000–29.021 mm (1.1417–1.1423 in.)	29.050 mm (1.1437 in.)

BACK

Protected by AR

Item	Measurement	Qualification	Standard or New	Service Limit
Mainshaft	Diameter of needle bearing contact area	at stator shaft	22.984–23.000 mm (0.9049–0.9055 in.)	When worn or damaged
		at 4th gear	52.975–52.991 mm (2.0856–2.0863 in.)	When worn or damaged
		at 5th gear collar	33.975–33.991 mm (1.3376–1.3382 in.)	When worn or damaged
	I.D. of 4th gear		59.000–59.019 mm (2.3228–2.3236 in.)	When worn or damaged
	I.D. of 5th gear		40.000–40.016 mm (1.5748–1.5754 in.)	When worn or damaged
	End play of 4th gear		0.03–0.31 mm (0.001–0.012 in.)	———
	End play of 5th gear		0.10–0.22 mm (0.004–0.009 in.)	———
	41 x 73 mm thrust shim thickness	No. 1	7.85 mm (0.309 in.)	When worn or damaged
		No. 2	7.90 mm (0.311 in.)	When worn or damaged
		No. 3	7.95 mm (0.313 in.)	When worn or damaged
		No. 4	8.00 mm (0.315 in.)	When worn or damaged
		No. 5	8.05 mm (0.317 in.)	When worn or damaged
		No. 6	8.10 mm (0.319 in.)	When worn or damaged
	Thrust washer thickness	27 x 47 x 5 mm	5.00 mm (0.197 in.)	When worn or damaged
	Length of 5th gear collar		58.5–58.6 mm (2.303–2.307 in.)	———
	5th gear collar flange thickness		4.45–4.60 mm (0.175–0.181 in.)	When worn or damaged
	Sealing ring thickness	32 mm sealing ring	1.87–1.97 mm (0.074–0.078 in.)	1.800 mm (0.071 in.)
		29 mm sealing ring	1.87–1.97 mm (0.074–0.078 in.)	1.800 mm (0.071 in.)
	Width of sealing ring groove		2.025 – 2.060 mm (0.080 – 0.081 in.)	2.080 mm (0.082 in.)
	Clutch feed pipe O.D.	4th clutch	5.97 – 5.98 mm (0.2350 – 0.2354 in.)	5.95 mm (0.2343 in.)
		5th clutch	11.47 – 11.48 mm (0.4516 – 0.4520 in.)	11.45 mm (0.4508 in.)
	Clutch feed pipe bushing I.D.	4th clutch	6.018 – 6.030 mm (0.2369 – 0.2374 in.)	6.045 mm (0.2380 in.)
		5th clutch	11.500 – 11.518 mm (0.4528 – 0.4535 in.)	11.530 mm (0.4539 in.)

(cont'd)

BACK

Protected by AR

Standards and Service Limits

5-speed Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Countershaft	Diameter of needle bearing contact area	at 5th gear	34.975–34.991 mm (1.3770–1.3776 in.)	When worn or damaged
		at 2nd gear	39.979–40.000 mm (1.574–1.575 in.)	When worn or damaged
		at park gear	41.964–41.980 mm (1.6521–1.6528 in.)	When worn or damaged
		at right end	38.505–38.515 mm (1.5159–1.5163 in.)	When worn or damaged
	I.D. of 5th gear		41.000–41.016 mm (1.6142–1.6148 in.)	When worn or damaged
	I.D. of 3rd gear		50.000–50.016 mm (1.9685–1.9691 in.)	When worn or damaged
	I.D. of reverse gear		46.000–46.016 mm (1.8110–1.8116 in.)	When worn or damaged
	End play of 1st gear		0.00–0.33 mm (0.000–0.013 in.)	—
	End play of 5th gear		0.04–0.27 mm (0.002–0.011 in.)	—
	End play of 3rd gear		0.015–0.045 mm (0.0006–0.0018 in.)	—
	End play of reverse gear		0.10–0.25 mm (0.004–0.010 in.)	—
	31 x 63.5 x 8.5 mm splined washer	A	3.503–3.515 mm (0.1379–0.1384 in.)	When worn or damaged
		B	3.490–3.502 mm (0.1374–0.1379 in.)	When worn or damaged
		C	3.477–3.489 mm (0.1369–0.1374 in.)	When worn or damaged
		D	3.464–3.476 mm (0.1364–0.1369 in.)	When worn or damaged
	Length of distance collar '00-01 models		53.92–53.96 mm (2.123–2.124 in.)	—
	Length of distance collar '02-03 models	35 x 47 x 45.6	45.56–45.60 mm (1.794–1.795 in.)	—
		35 x 47 x 7.8	5.92–5.96 mm (0.233–0.235 in.)	—
	Cotter thickness		1.99–2.02 mm (0.078–0.080 in.)	—
	Reverse selector hub O.D.		55.87–55.90 mm (2.1996–2.2008 in.)	When worn or damaged
	Clutch feed pipe O.D.		8.97–8.98 mm (0.353–0.354 in.)	8.95 mm (0.352 in.)
	Clutch feed pipe bushing I.D.		9.000–9.015 mm (0.354–0.355 in.)	9.030 mm (0.356 in.)

BACK

Protected by AR

Item	Measurement	Qualification	Standard or New	Service Limit
Secondary shaft	Diameter of needle bearing contact area	at 1st gear	37.978–37.993 mm (1.4951–1.4958 in.)	When worn or damaged
		at 2nd gear	33.986–33.999 mm (1.3380–1.3385 in.)	When worn or damaged
	I.D. of 1st gear		44.000–44.016 mm (1.7323–1.7329 in.)	When worn or damaged
	I.D. of 2nd gear		40.000–40.016 mm (1.5748–1.5754 in.)	When worn or damaged
	End play of 1st gear		0.07–0.15 mm (0.003–0.006 in.)	———
	End play of 2nd gear		0.04–0.12 mm (0.002–0.005 in.)	———
	38 x 56.5 mm splined washer thickness	No. 1	6.85 mm (0.270 in.)	When worn or damaged
		No. 2	6.90 mm (0.272 in.)	When worn or damaged
		No. 3	6.95 mm (0.274 in.)	When worn or damaged
		No. 4	7.00 mm (0.276 in.)	When worn or damaged
		No. 5	7.05 mm (0.278 in.)	When worn or damaged
		No. 6	7.10 mm (0.280 in.)	When worn or damaged
	37 x 55 mm thrust shim thickness	No. 1	4.90 mm (0.193 in.)	When worn or damaged
		No. 2	4.95 mm (0.195 in.)	When worn or damaged
		No. 3	5.00 mm (0.197 in.)	When worn or damaged
		No. 4	5.05 mm (0.199 in.)	When worn or damaged
		No. 5	5.10 mm (0.201 in.)	When worn or damaged
		No. 6	5.15 mm (0.203 in.)	When worn or damaged
		No. 7	5.20 mm (0.205 in.)	When worn or damaged
	Cotter thickness		1.99–2.02 mm (0.078–0.080 in.)	———
	Sealing ring thickness		1.890–1.950 mm (0.074–0.077 in.)	1.800 mm (0.071 in.)
	Width of sealing ring groove		2.025–2.060 mm (0.080–0.081 in.)	2.080 mm (0.082 in.)
	Clutch feed pipe O.D.		7.97–7.98 mm (0.3138–0.3142 in.)	7.95 mm (0.3130 in.)
	Clutch feed pipe bushing I.D.		8.000–8.015 mm (0.3150–0.3156 in.)	8.030 mm (0.3161 in.)
Reverse idler gear	Diameter of needle bearing contact area	at reverse idler gear shaft	13.990–14.000 mm (0.5508–0.5512 in.)	When worn or damaged
	End play		0.06–0.38 mm (0.002–0.015 in.)	———
	I.D.		18.007–18.020 mm (0.7089–0.7094 in.)	When worn or damaged
	Thrust washer thickness	Transmission housing side	0.96–1.04 mm (0.038–0.041 in.)	———
		Reverse idler gear shaft holder side	0.97–1.05 mm (0.038–0.041 in.)	———
	I.D. of reverse idler gear shaft holder		14.006–14.024 mm (0.5514–0.5521 in.)	When worn or damaged
	I.D. of transmission housing of reverse idler gear shaft contact area		14.006–14.024 mm (0.5514–0.5521 in.)	———

(cont'd)

BACK

Protected by AR

Standards and Service Limits

5-speed Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coils
Main valve body springs (see page 14-411).	Shift valve D spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	33.7 mm (1.327 in.)	11.6
	Shift valve C spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
	Kick-down valve spring		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in)	21.7
	Modulator valve spring		1.6 mm (0.063 in.)	10.4 mm (0.409 in.)	33.5 mm (1.319 in)	9.8
	Relief valve spring		1.2 mm (0.047 in.)	11.1 mm (0.437 in.)	39.0 mm (1.535 in.)	9.9
	Lock-up shift valve spring		0.9 mm (0.035 in.)	7.6 mm (0.299 in.)	63.0 mm (2.480 in.)	22.4
	Cooler check valve spring		0.6 mm (0.024 in.)	5.8 mm (0.228 in.)	14.5 mm (0.571 in.)	6.8
	Torque converter check valve spring		1.2 mm (0.047 in.)	8.6 mm (0.339 in.)	34.4 mm (1.354 in.)	11.7
	Servo control valve spring		0.9 mm (0.035 in.)	6.4 mm (0.252 in.)	32.5 mm (1.280 in.)	17.5
	Reverse CPC valve spring		0.7 mm (0.028 in.)	6.1 mm (0.240 in)	17.8 mm (0.701 in.)	7.9
Regulator valve body springs (see page 14-414).	Stator reaction spring		5.5 mm (0.217 in.)	37.4 mm (1.472 in.)	30.3 mm (1.193 in.)	2.1
	Regulator valve spring A		1.9 mm (0.075 in.)	14.7 mm (0.579 in.)	80.6 mm (3.173 in.)	16.1
	Regulator valve spring B		1.6 mm (0.063 in.)	9.2 mm (0.362 in.)	44.0 mm (1.732 in.)	12.5
	Lock-up control valve spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	42.9 mm (1.689 in.)	14.2
	Lock-up timing valve spring		0.65 mm (0.026 in.)	6.6 mm (0.260 in.)	34.8 mm (1.370 in.)	15.6
Servo body springs (see page 14-415).	CPC valve B		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	CPC valve A		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	Shift valve B		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
	Shift valve A		0.8 mm (0.031 in.)	6.6 mm (0.260 in.)	49.1 mm (1.933 in.)	21.7
Top accumulator body springs (see page 14-416).	Shift valve E		0.8 mm (0.031 in.)	7.1 mm (0.280 in.)	49.0 mm (1.929 in.)	17.2
	CPC valve C		0.7 mm (0.028 in.)	6.1 mm (0.240 in.)	17.8 mm (0.701 in.)	7.9
	5th accumulator spring A		2.2 mm (0.087 in.)	16.4 mm (0.646 in.)	75.7 mm (2.980 in.)	14.2
	5th accumulator spring B		2.0 mm (0.079 in.)	10.0 mm (0.394 in.)	45.5 mm (1.791 in.)	11.6
	4th/1st-hold accumulator spring		3.4 mm (0.134 in.)	19.6 mm (0.772 in.)	57.4 mm (2.260 in.)	8.4

BACK

Protected by AR

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coils
Accumulator body springs (see page 14-417).	1st accumulator spring B		2.3 mm (0.091 in.)	12.6 mm (0.496 in.)	42.0 mm (1.654 in.)	9.9
	1st accumulator spring A		2.4 mm (0.094 in.)	19.5 mm (0.768 in.)	67.7 mm (2.665 in.)	10.2
	2nd accumulator spring B		2.6 mm (0.102 in.)	13.0 mm (0.512 in.)	44.0 mm (1.732 in.)	9.0
	2nd accumulator spring A		2.5 mm (0.098 in.)	19.6 mm (0.772 in.)	57.7 mm (2.272 in)	9.5
3rd accumulator spring (see page 14-418).	3rd accumulator spring		3.1 mm (0.122 in.)	19.6 mm (0.772 in.)	39.4 mm (1.551 in.)	5.5

Item	Measurement	Qualification	Standard or New	Service Limit
A/T differential carrier	Pinion shaft contact area I.D.		18.000–18.025 mm (0.7087–0.7096 in.)	———
	Carrier-to-pinion shaft clearance		0.013–0.054 mm (0.001–0.002 in.)	0.1 mm (0.004 in.)
	Driveshaft contact area I.D.		30.025–30.055 mm (1.182–1.183 in.)	———
	Carrier-to-driveshaft clearance		0.045–0.096 mm (0.002–0.004 in.)	0.12 mm (0.005 in)
	Carrier-to-intermediate shaft clearance		0.080–0.126 mm (0.003–0.005 in.)	———
	Tapered roller bearing starting torque (preload)	For new bearing	2.7–3.9 N·m (28–40 kgf·cm, 24–35 lbf·in.)	Adjust
		For used bearing	2.5–3.6 N·m (25–37 kgf·cm, 22–32 lbf·in.)	Adjust
A/T differential pinion gear	Backlash		0.175–0.275 mm (0.007–0.011 in.)	———
	I.D.		18.042–18.066 mm (0.7103–0.7113 in.)	———
	Pinion gear-to-pinion shaft clearance		0.055–0.095 mm (0.0022–0.0037 in.)	0.12 mm (0.005 in)

BACK

Protected by AR

Standards and Service Limits

Steering

Item	Measurement	Qualification	Standard or New	Service Limit
Steering wheel	Rotational play measured at outside edge	With engine running	0–10 mm (0–0.39 in.)	————
	Starting load measured at outside edge	With engine running	25 N (2.5 kgf, 5.5 lbs)	————
Gearbox	Angle of rack guide screw loosened from locked position		20°	
Pump	Output pressure with shut-off valve closed		7,600–8,300 kPa (78–85 kgf/cm², 1,110–1,210 psi)	
Power steering fluid	Capacity	Use Honda power steering fluid	For fluid change: 0.4 ℓ (0.42 US qt)	
			For system overhaul: 1.1 ℓ (1.16 US qt)	
Power steering pump belt NOTE: Adjust a *new* belt to the new belt spec, run the engine for 5 minutes, then readjust it to the *used* belt spec.	Deflection with 98 N (10 kgf, 22 lbs) applied mid-way between pulleys		Used belt: 13.0–16.5 mm (0.51–0.65 in.)	
			New belt: 8.5–11.0 mm (0.33–0.43 in.)	
	Tension (measured with belt tension gauge)		Used belt: 390–540 N (40–55 kgf, 88–121 lbs)	
			New belt: 740–880 N (75–90 kgf, 165–198 lbs)	

Suspension

Item	Measurement	Qualification	Standard or New	Service Limit
Wheel alignment	Camber	Front	0°00′±1°	
		Rear	−0°30′±30′	
	Caster	Front	2°48′±1°	
	Total Toe	Front	0±2 mm (0±1/16 in.)	
		Rear	IN 2±2 (1/16±1/16 in.)	
	Front wheel turning angle inside	Premium	38°32′±2°	
		Type-S	35°16′±2°	
	Front wheel turning angle outside	Premium	31°03′ (Reference)	
		Type-S	29°13′ (Reference)	
Aluminum wheel	Runout	Axial	0–0.7 mm (0–0.03 in.)	2.0 mm (0.08 in.)
		Radial	0–0.7 mm (0–0.03 in.)	1.5 mm (0.06 in.)
Wheel bearings	End play	Front	0–0.05 mm (0–0.002 in.)	
		Rear	0–0.05 mm (0–0.002 in.)	

BACK

Protected by AR

Brakes

Item	Measurement	Qualification	Standard or New	Service Limit
Parking brake pedal	Distance travelled when pulled with 294 N (30 kgf, 66 lbs) of force		2–4 clicks	
Brake pedal	Pedal height (carpet removed)		169 mm (6 5/8 in.)	
	Free play		1–5 mm (1/16–3/16 in.)	
Master cylinder	Piston-to-pushrod clearance		0–0.4 mm (0–0.02 in.)	
Brake disc	Thickness	Front	27.9–28.1 mm (1.10–1.11 in.)	26.0 mm (1.02 in.)
		Rear	8.9–9.1 mm (0.350–0.358 in.)	7.5 mm (0.30 in.)
	Runout	Front	————	0.10 mm (0.004 in.)
		Rear	————	0.10 mm (0.004 in.)
	Parallelism	Front and rear		0.015 mm (0.0006 in.)
Brake pads	Thickness	Front	10.5–11.5 mm (0.41–0.45 in.)	1.6 mm (0.06 in.)
		Rear	8.5–9.5 mm (0.33–0.37 in.)	1.6 mm (0.06 in.)

Air Conditioning

Item	Measurement	Qualification	Standard or New	Service Limit
Refrigerant	Type		HFC-134a (R-134a)	
	Capacity of system		600–650 g (21–23 oz)	
Refrigerant oil	Type		DENSO: ND-OIL 8 (P/N 38897-PR7-A01AH or 38899-PR7-A01)	
	Capacity of components	Condenser	25 mℓ (5/6 fl oz)	
		Evaporator	40 mℓ (1 1/3 fl oz)	
		Each line and hose	10 mℓ (1/3 fl oz)	
		Receiver	10 mℓ (1/3 fl oz)	
		Compressor	160–175 mℓ (5 1/3–6 fl oz)	
Compressor	Field coil resistance	at 68°F (20°C)	3.4–3.8 Ω	
	Pulley-to-pressure plate clearance		0.5±0.15 mm (0.02±0.006 in.)	

BACK

Protected by AR

Design Specifications

Item	Measurement	Qualification	Specification
DIMENSIONS	Overall length		4,900 mm (192.9 in.)
	Overall width		1,785 mm (70.3 in.)
	Overall height		1,420 mm (55.9 in.)
	Wheelbase		2,745 mm (108.1 in.)
	Track	Front	1,555 mm (61.2 in.)
		Rear	1,535 mm (60.4 in.)
	Ground clearance		159 mm (6.3 in.)
	Seating capacity		Five
WEIGHT (U.S.A.)	Gross Vehicle Weight Rating (GVWR)	Premium	4,400 lbs
		Type-S	4,475 lbs
WEIGHT (CANADA)	Gross Vehicle Weight Rating (GVWR)	Premium	1,995 kg
		Type-S	2,030 kg
ENGINE	Type		Water-cooled, 4-stroke SOHC VTEC V6 gasoline engine
	Cylinder arrangement		60° V6-cylinder, transverse
	Bore and stroke		89.0 x 86.0 mm (3.50 x 3.39 in.)
	Displacement		3,210 cm^3 (mℓ) (196 cu in.)
	Compression ratio	J32A1 engine	9.8
		J32A2 engine	10.5
	Valve train		Belt driven, SOHC VTEC 4 valves per cylinder
	Lubrication system		Forced, wet sump, with trochoid pump
	Oil pump displacement	at 6,000 engine rpm	58.4 ℓ (61.7 US qt)/minute
	Water pump displacement	at 6,000 engine rpm	172 ℓ (182 US qt)/minute
	Fuel required		Premium UNLEADED gasoline with 91 Pump Octane Number or higher
STARTER	Type		Gear reduction
	Normal output		1.6 kW
	Nominal voltage		12 V
	Hour rating		30 seconds
	Direction of rotation		Clockwise as viewed from gear end
4-SPEED AUTOMATIC TRANSMISSION	Type		Electronically controlled automatic, 4-speed forward, 1 reverse
	Primary reduction		Direct 1:1
	Gear ratio	1st	2.534
		2nd	1.502
		3rd	0.947
		4th	0.608
		Reverse	1.846
	Final reduction	Type	Single helical gear
		Gear ratio	4.200

BACK

Protected by AR

Item	Measurement	Qualification	Specification
5-SPEED AUTOMATIC TRANSMISSION	Type		Electronically controlled automatic, 5-speed forward, 1 reverse
	Primary reduction		Direct 1:1
	Gear ratio (Premium)	1st	2.563
		2nd	1.552
		3rd	1.021
		4th	0.653
		5th	0.470
		Reverse	1.846
	Gear ratio (Type-S)	1st	2.563
		2nd	1.552
		3rd	1.021
		4th	0.727
		5th	0.520
		Reverse	1.846
	Final reduction	Type	Single helical gear
		Gear ratio	4.428
STEERING	Type		Power-assisted rack and pinion
	Overall ratio	Premium	16.09
		Type-S	16.08
	Turns, lock-to-lock	Premium	3.11
		Type-S	2.88
	Steering wheel diameter		380 mm (15.0 in.)
SUSPENSION	Type	Front	Independent double wishbone, coil spring with stabilizer
		Rear	Five-link double wishbone
	Shock absorber	Front and rear	Telescopic, hydraulic, nitrogen gas-filled
WHEEL ALIGNMENT	Camber	Front	0°
		Rear	−0°30′
	Caster	Front	2°48′
	Total toe	Front	0 mm (0 in.)
		Rear	In 2 mm (1/16 in.)
BRAKES	Type of service brake	Front	Power-assisted self-adjusting ventilated disc
		Rear	Power-assisted self-adjusting solid disc
	Type of parking brake		Mechanical actuating, rear wheels
	Pad friction surface area	Front	58 cm^2 x 2 (9.0 sq in x 2)
		Rear	28 cm^2 x 2 (4.3 sq in x 2)
TIRES	Size of front and rear tires	Premium	P205/60 R16 91V M+S
		Type-S	P215/50 R17 93V M+S
	Size of spare tires		T135/80 R16

BACK

Protected by AR

Design Specifications

(cont'd)

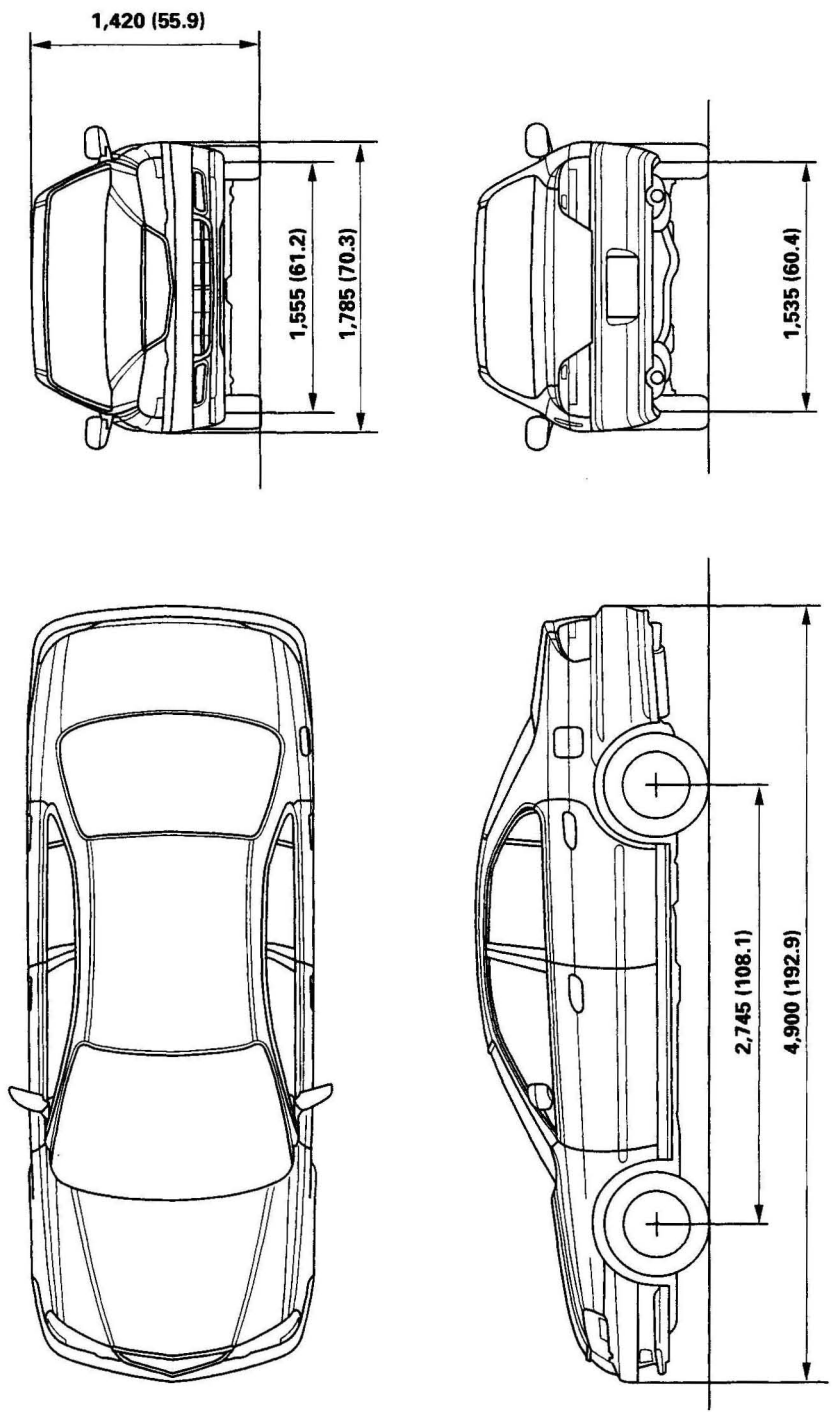
Item	Measurement	Qualification	Specification
AIR CONDITIONING	Cooling capacity		4,150 Kcal/h (16,470 BTU/h)
	Compressor	Type/Manufacturer	Swash plate/DENSO
		Number of cylinders	10
		Capacity	188 mℓ/rev. (11.47 cu in/rev.)
		Maximum speed	8,400 rpm
		Lubricant capacity	160 mℓ (5 1/3 fl oz)
		Lubricant type	ND-OIL 8
	Condenser	Type	Corrugated fin
	Evaporator	Type	Corrugated fin
	Blower	Type	Sirocco fan
		Motor input	240 W/12 V
		Speed control	Infinite variable
		Maximum capacity	518 m^3/h (18,300 cu ft/h)
	Temperature control		Air-mix type
	Compressor clutch	Type	Dry, single plate, Poly-V belt drive
		Electrical power consumption at 68°F (20°C)	40 W maximum at 12 V
	Refrigerant	Type	HFC-134 a (R-134 a)
		Quantity	600—650 g (21—23 fl oz)
ELECTRICAL RATINGS	Battery		12 V—65 AH/20 hours
	Starter		12 V—1.6 kW
	Alternator		12 V—105A
	Fuses	Under-hood fuse/relay box	120A, 60A, 40A, 30A, 20A, 15A
		Under-hood ABS fuse/relay box	40A, 20A, 7.5A
		Under-dash driver's fuse/relay box	30A, 15A, 10A, 7.5A
		Under-dash passenger's fuse/relay box	30A, 20A, 10A, 7.5A
	Light bulbs	Headlight high beam	12 V—60 W (HB3)
		Headlight low beam	12 V—35 W (HID)
		Fog lights	12 V—51 W (HB4)
		Front turn signal/Front parking lights	12 V—24 W/2.2 CP (candlepower) (two filaments)
		Front side marker light	12 V—5 W
		Rear turn signal lights	12 V—21 W
		Brake/Taillights	12 V—21/5 W
		High mount brake light	12 V—21 W
		Back-up lights	12 V—18 W
		License plate light	12 V—3 CP
		Ceiling light	12 V—7 W
		Trunk light	12 V—5 W
		Door courtesy lights	12 V—2 CP
		Vanity mirror lights	12 V—1.1 W
		Glove box light	12 V—2 CP
		Spotlights	12 V—4 CP
		Gauge lights	12 V—3.0 W,12 V—1.4 W
		Indicator lights	12 V—LED,12 V—1.4 W,14 V—0.56 W
		Panel and pilot lights	14 V—0.56 W, 0.84 W, 0.95 W
		Climate control unit	14 V—1.12 W, 0.56 W
		Coin box light	12 V—1.4 W
		Center console light	12 V—2 CP

BACK

Protected by AR

Body Specifications

Unit: mm (in.)



BACK

Protected by AR

Maintenance

Lubricants and Fluids **3-2**

Maintenance Schedule for Normal Conditions (1999-2000 Models)
Listed by Distance/Time 3-4

Maintenance Schedule for Severe Conditions (1999-2000 Models)
Listed by Distance/Time 3-6

Maintenance Schedule for Normal and Severe Conditions (1999-2000 Models)
Listed by Maintenance Item 3-8

Maintenance Schedule for Normal Conditions (2001 -2003 Models)
Listed by Distance/Time 3-10

Maintenance Schedule for Severe Conditions (2001-2003 Models)
Listed by Distance/Time 3-12

Maintenance Schedule for Normal and Severe Conditions (2001-2003 Models)
Listed by Maintenance Item 3-14

Protected by AR

Lubricants and Fluids

For the details of lubrication points and type of lubricants to be applied, refer to the illustrated index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

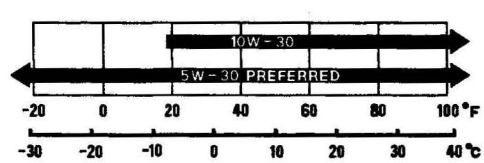
NO.	LUBRICATION POINTS	LUBRICANT
1	Engine	Honda Motor Oil API Service Grade: Use SJ "Energy Conserving" grade oil. The oil container may also display the API Certification seal shown below. Make sure it says "For Gasoline Engines." SAE Viscosity: See chart below.
2	Transmission	Honda ATF-Z1*1
3	Brake system (includes ABS line)	Honda DOT 3 Brake Fluid*2
4	Power steering gearbox	Steering grease (P/N 08733-B070E)
5 6	Throttle cable end (dashboard lower panel hole) Shift lever	Silicone grease
7	Throttle cable end (throttle link)	Super High Temp Urea Grease (P/N 08798-9002)
8 9 10 11 12 13 14	Brake booster clevis Pedal linkage Battery terminals Fuel fill door Hood hinges and hood latch Trunk hinges and latch Door hinges, upper and lower	Multi-purpose grease
15	Rear brake shoe linkage	Molykote Grease 44MA
16	Caliper piston boot, caliper pins, and boots	Honda Caliper Grease (P/N 08C30-B0234M)
17	Power steering system	Honda Power Steering Fluid *3
18	Air conditioning compressor	Compressor oil: DENSO: ND-OIL 8 (P/N 38897-PR7-A01 AH or 38899-PR7-A01) For Refrigerant: HFC-134 a (R-134 a)

API CERTIFICATION SEAL

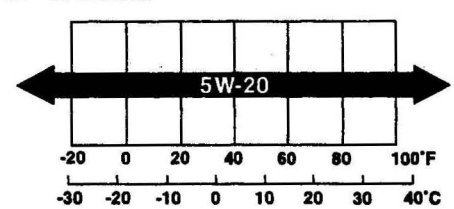


Recommended Engine Oil
Engine oil viscosity for ambient temperature ranges

'99—01 models



'02—03 models

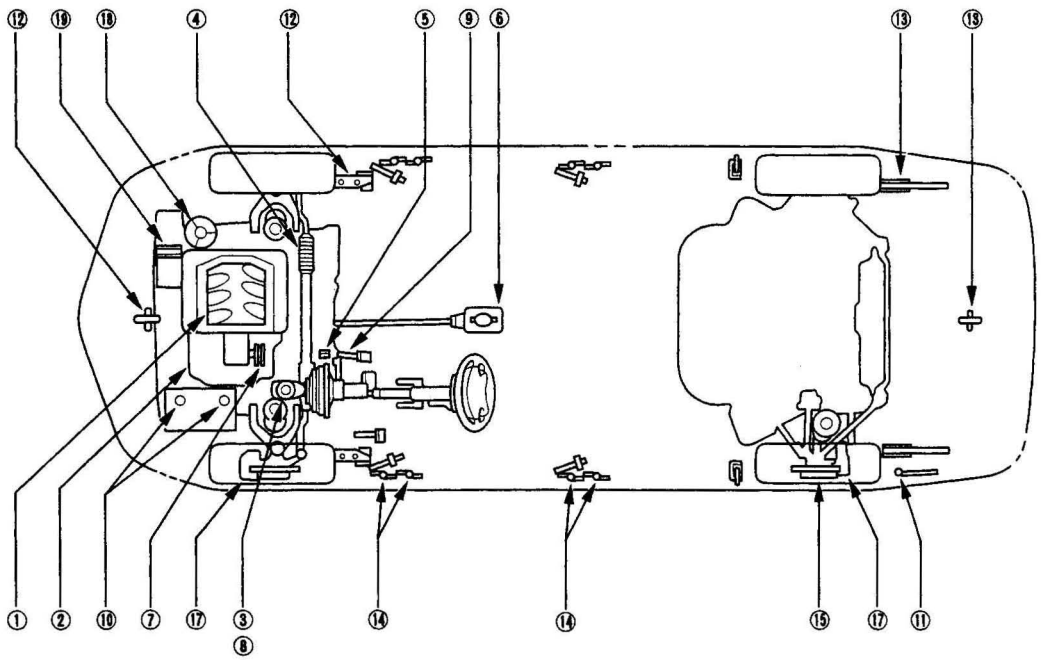


*1: Always use Honda ATF-Z1. Using a non-Honda ATF can affect shift quality.
*2: Always use Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
*3: Always use Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.

BACK

Protected by AR

NOTE:
Lubricate all hinges, latches, and locks once a year.
In corrosive areas, more frequent lubrication is necessary.



Maintenance Schedule for Normal Conditions (1999-2000 Models)

Listed by Distance/Time

Service at the indicated distance or time, whichever comes first. For Canada models, this two-page Maintenance Schedule outlines the minimum required maintenance.
According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended interval to ensure long-term reliability.

7,500 mi/ 12,000 km/ —	☐ Do items in A.
15,000 mi/ 24,000 km/ 1 year	☐ Do items in A and B.
22,500 mi/ 36,000 km/—	☐ Do items in A.
30,000 mi/ 48,000 km/ 2 years	☐ Do items in A, B, and C.
37,500 mi/ 60,000 km/ —	☐ Do items in A.

45,000 mi/ 72,000 km/ 3 years

- ☐ Replace engine coolant (see page 10-13) Capacity: 5.6 ℓ (5.9 US qt). Use Honda All Season Antifreeze/Coolant Type 2.
- ☐ Replace brake fluid (see page 19-8). Use Honda DOT 3 Brake Fluid. Fill to between marks on reservoir.
- ☐ Do items in A and B.

52,500 mi/ 84,000 km/ —	☐ Do items in A.
60,000 mi/ 96,000 km/4 years	☐ Do items in A, B, and C.
67,500 mi/108,000 km/ —	☐ Do items in A.

75,000 mi/120,000 km/ 5 years

- ☐ Replace engine coolant (see page 10-13) Capacity: 5.6 ℓ (5.9 US qt). Use Honda All Season Antifreeze/Coolant Type 2.
- ☐ Do items in A and B.

82,500 mi/132,000 km/—	☐ Do items in A.

90,000 mi/144,000 km/ 6 years

- ☐ Replace transmission fluid. '99 model: 2.7 ℓ (2.9 US qt), '00 model: 2.9 ℓ (3.1 US qt). Use Honda ATF-Z1 ('99 model: (see page 14-109), '00 model : (see page 14-350)).
- ☐ Replace brake fluid (see page 19-8). Use Honda DOT 3. Fill to between marks on reservoir.
- ☐ Do items in A, B, and C.

97,500 mi/156,000 km/ —	☐ Do items in A.

105,000 mi/168,000 km/ 7 years

- ☐ Replace timing belt (see page 6-18) and inspect water pump (see page 10-12).
- ☐ Check idle speed. * Should be 680±50 rpm in [N] or [P] position (see page 11-157).
- ☐ Replace engine coolant (see page 10-13). Capacity: 5.6 ℓ (5.9 US qt). Use Honda All Season Antifreeze/Coolant Type 2.
- ☐ Inspect valve clearance (cold) Intake: 0.20−0.24 mm (0.008−0.009 in.) Exhaust: 0.28−0.32 mm (0.011−0.013 in.) (see page 6-13).
- ☐ Replace spark plugs. Use NGK (PZFR5F−11) or DENSO (PKJ16CR−L11). Gap: 1.0−1.1 mm (0.039−0.043 in.) (see page 4-17).
- ☐ Do items in A and B.

112,500 mi/181,000 km/ —	☐ Do items in A.
120,000 mi/193,000 km/ 8 years	☐ Do the items in A, B, and C.

BACK

Protected by AR

Do the items in parts A, B, and C as required for mileage/time interval listed.

A

- ☐ Replace engine oil (see page 8-5). —Capacity with filter change: 4.4 ℓ (4.6 US qt).
- ☐ Rotate tires. Follow the pattern shown in the Owner's Manual —Check tire inflation and condition.

B

- ☐ Replace engine oil filter (see page 8-5).
- ☐ Inspect front and rear brakes (see page 19-11).
  - Check pads and discs for wear (thickness), damage, and cracks.
  - Check calipers for damage, leaks, and tightness of mount bolts.
- ☐ Check parking brake adjustment. Should be fully applied within 2 to 4 clicks.
- ☐ Inspect tie rod ends, steering gearbox, and boots (see page 17-35).
  - Check rack grease and steering linkage.
  - Check boots for damage and leaking grease.
  - Check fluid line for damage and leaks.
- ☐ Inspect suspension components.
  - Check bolts for tightness.
  - Check condition of ball joint boots for deterioration and damage.
- ☐ Inspect driveshaft boots. Check boots for cracks and boot bands for tightness (see page 16-3).
- ☐ Inspect brake hoses and lines (including ABS). —Check the master cylinder, proportioning control valve, and ABS modulator for damage and leakage (see page 19-30).
- ☐ Check all fluid levels and condition of fluids; check for leaks. If necessary, add ATF ('99 model: (see page 14-109), '00 model : (see page 14-350)), engine coolant, brake fluid, and windshield washer fluid.
- ☐ Inspect cooling system hoses and connections (see page 10-2).
  - Check for damage, leaks, and deterioration.
  - Check for proper fan operation.
- ☐ Inspect exhaust system. * Check catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness (see page 9-12).
- ☐ Inspect fuel lines and connections. * Check for loose connections, cracks and deterioration; retighten loose connections and replace damaged parts (see page 11-167).

C

- ☐ Replace air cleaner element.
- ☐ Inspect and adjust drive belts, for cracks and damage.
  - Alternator, compressor belt: Inspect auto tensioner indicator, Needs no adustment (see page 4-23).
  - P/S pump belt: Press with 98 N (10 kgf, 22 lbs) 13.0—16.5 mm (0.51—0.65 in.) deflection (see page 17-15).
- ☐ Replace the air conditioning filter (see page 21-63).
  - Replace it twice as often (at 30,000 mile interval) if the vehicle is driven mostly in urban areas that have high concentrations of soot in the air from industry and diesel-powered vehicles.
  - Replace it whenever airflow from the climate control system is less than normal.

BACK

Maintenance Schedule for Severe Conditions (1999-2000 Models)

Protected by A.R

Listed by Distance/Time

Service at the indicated distance or time, whichever comes first. Use this schedule if the vehicle is driven MAINLY in Canada or in any of the following conditions; if only OCCASIONALLY driven in these conditions, use the Normal Conditions schedule (see page 3-4).
According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended interval to ensure long-term reliability.

Severe Driving Conditions

- Less than 5 miles (8 km) per trip or, in freezing temperatures, less than 10 miles (16 km) per trip
- In extremely; hot weather (over 90°F/32°C)
- Extensive idling or long periods of stop-and-go driving
- Trailer towing, driving in mountainous conditions
- On muddy, dusty, or de-iced roads

3,750 mi/ 6,000 km/ —
- ☐ Replace oil and filter.

7,500 mi/ 12,000 km/ —
- ☐ Do items in A.

11,250 mi/ 18,000 km/ —
- ☐ Replace oil and filter.

15,000 mi/ 24,000 km/ 1 year
- ☐ Clean air cleaner element with low pressure air.
- ☐ Do items in A and B.

18,750 mi/ 30,000 km/ —
- ☐ Replace oil and filter.

22,500 mi/ 36,000 km/ 1 1/2 years:
- ☐ Do items in A.

26,250 mi/ 42,000 km/ —
- ☐ Replace oil and filter

30,000 mi/ 48,000 km/ 2 years:
- ☐ Do items in A, B, and C

33,750 mi/ 54,000 km/ —
- ☐ Replace oil and filter.

37,500 mi/ 60,000 km/2 1/2 years:
- ☐ Do items in A.

41,250 mi/ 66,000 km/ —
- ☐ Replace oil and filter.

45,000 mi/ 72,000 km/ 3 years:
- ☐ Clean air cleaner element with low pressure air.
- ☐ Replace engine coolant (see page 10-13). Use Honda All Season Antifreeze/Coolant Type 2.
  - Capacity: 5.6 ℓ (5.9 US qt).
- ☐ Replace brake fluid (see page 19-8). Use Honda DOT 3. Fill to between marks on reservoir.
- ☐ Do items in A and B.

48,750 mi/ 78,000 km/ —
- ☐ Replace oil and filter.

52,500mi/ 84,000 km 3 1/2 years:
- ☐ Do items in A.

56,250 mi/ 90,000 km/ —
- ☐ Replace oil and filter.

60,000 mi/ 96,000 km/ 4 years:
- ☐ Replace timing belt, and inspect the water pump (see page 10-12) if the vehicle is regularly driven in weather over 110°F (43°C) or under −20°F (−29°C); If not, replace the belts at 105,000 miles.
- ☐ Do items in A, B and C.

63,750 mi/102,000 km/ —
- ☐ Replace oil and filter.

67,500 mi/108,000 km 4 1/2 years:
- ☐ Do items in A.

71,250 mi/114,000 km /—
- ☐ Replace oil and filter.

75,000mi/120,000 km/5 years:
- ☐ Clean air cleaner element with low pressure air.
- ☐ Replace engine coolant (see page 10-13). Use Honda All Season Antifreeze/Coolant Type 2.
  - Capacity: 5.6 ℓ (5.9 US qt).
- ☐ Do items in A and B.

78,750 mi/126,000 km/ —
- ☐ Replace oil and filter.

82,500 mi/132,000 km/5 1/2 years
- ☐ Do items in A.

86,250 mi/138,000 km/ —
- ☐ Replace oil and filter.

90,000 mi/144,000 km/ 6 years:
- ☐ Replace brake fluid (see page 19-8). Use Honda DOT 3 brake fluid; fill to between marks on reservoir.
- ☐ Do items in A, B and C.

93,750 mi/150,000 km/ —
- ☐ Replace oil and filter.

97,500 mi/156,000 km/6 1/2 years:
- ☐ Do items in A.

101,250 mi/162,000 km/ —
- ☐ Replace oil and filter.

105,000 mi/168,000 km/ 7 years:
- ☐ Clean air cleaner element with low pressure air.
- ☐ Replace timing belt (see page 6-18), and inspect the water pump (see page 10-12) only if the belts were not replaced at 60,000 miles.
- ☐ Check idle speed. * Should be 680 ± 50 rpm in [N] or [P] position (see page 11-157).
- ☐ Replace engine coolant (see page 10-13). Use Honda All Season Antifreeze/Coolant Type 2.
  - Capacity: 5.6 ℓ (5.9 US qt).
- ☐ Inspect valve clearance (cold) Intake: 0.20−0.24 mm (0.008−0.009 in.), Exhaust: 0.28−0.32 mm (0.011−0.013 in.) (see page 6-13).
- ☐ Replace spark plugs, Use NGK (PZFR5F−11) or DENSO (PKJ16CR−L11) Gap: 1.0−1.1 mm (0.039−0.043 in.) (see page 4-17).
- ☐ Do items in A, B.

108,750 mi/174,000 km/ —
- ☐ Replace oil and filter.

112,500 mi/180,000 km/ 7 1/2 years:
- ☐ Do items in A.

116,250 mi/186,000 km/ —
- ☐ Replace oil and filter.

120,000 mi/192,000 km/ 8 years:
- ☐ Do items A, B, and C.

BACK

Protected by AR

Do the items in parts A, B, and C as required for mileage/time interval.

A

- ☐ Replace engine oil and filter (see page 8-5). — Capacity with filter change: 4.4 ℓ (4.6 US qt).
- ☐ Inspect front and rear brakes, every 6 months if vehicle is driven less than 7,500 mile per year (see page 19-11).
  - Check pads and discs for wear (thickness), damage, and cracks.
  - Check calipers for damage, leaks, and tightness of mount bolts.
- ☐ Rotate tires, if the vehicle has been driven the distance listed. Follow the pattern shown in the Owner's Manual. (Check tire inflation and condition.)
- ☐ Inspect tie rod ends, steering gearbox, and boots (see page 17-35).
  - Check rack grease and steering linkage.
  - Check boots for damage and leaking grease.
  - Check fluid lines for damage and leaks.
- ☐ Inspect suspension components.
  - Check bolts for tightness.
  - Check condition of ball joint boots for deterioration and damage.
- ☐ Inspect driveshaft boots. Check boots for cracks and boot bands for tightness (see page 16-3).

B

- ☐ Check parking brake adjustment. — Should be fully applied within 2 to 4 clicks.
- ☐ Lubricate door locks, latches, and hinges with multi-perpose grease.
- ☐ Inspect brake hoses and lines (including ABS). Check the master cylinder, proportioning control valve, and ABS modulator for damage and leakage (see page 19-30).
- ☐ Check fluid levels and condition of fluids; check for leaks. If necessary, add ATF ('99 model: (see page 14-109), '00 model : (see page 14-350)), or engine coolant, brake fluid, and windshield washer fluid.
- ☐ Inspect cooling system hoses and connections (see page 10-2).
  - Check for damage, leaks, and deterioration.
  - Check for proper fan operation.
- ☐ Inspect exhaust system. * Check catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness (see page 9-12).
- ☐ Inspect fuel lines and connections. * Check for loose connections, cracks and deterioration; retighten loose connections and replace damaged parts (see page 11-167).
- ☐ Check all lights. Check function of all interior and exterior lights, and the positions of the headlights (see page 22-142).
- ☐ Inspect the vehicle underbody. Check the paint for damage, scratches, stone chipping, and dents.

C

- ☐ Replace air cleaner element (see page 11-186).
- ☐ Inspect and adjust drive belt. Look for cracks and damage.
  - Alternator compressor belt: Inspect auto tensioner indicator. Needs no adjustment (see page 4-23).
  - P/S pump belt: Press with 98 N (10 kgf, 22 lbs), 13.0 — 16.5 mm (0.51 — 0.65 in.) deflection (see page 17-15).
- ☐ Replace air conditioning filter, every 15,000 miles if vehicle is driven mostly where air has high concentration of soot from industry and diesel-powered vehicles; also replace it anytime airflow is less than usual (see page 21-63).
- ☐ Replace transmission fluid. Use Honda ATF. ('99 model: (see page 14-109), '00 model : (see page 14-350)).
  - '99 model: 2.7 ℓ (2.9 US qt), '00 model: 2.9 ℓ (3.1 US qt).

BACK

Maintenance Schedule for Normal and Severe Conditions (1999-2000 Models)

Listed by Maintenance Item

Service at the indicated distance or time, whichever comes first.
- If driven in normal conditions, do items with a dot (●).
- If driven in severe conditions (see page 3-6) or normally driven in Canada, do items with a circle (○) and items with a dot (●).

Service at the indicated distance or time, whichever comes first.	miles x 1000	3.75	7.5	11.25	15	18.75	22.5	26.25	30	33.75	37.5
	km x 1000	6	12	18	24	30	36	42	48	54	60
	years	—	1/2	—	1	—	1 1/2	—	2	—	2 1/2
Replace engine oil		Nomal Conditions: Every 7,500 miles (12,000 km) or 12 months Severe Conditions: Every 3,750 miles (6,000 km) or 6 months									
Replace engine oil filter		Nomal Conditions: Every other oil change Severe Conditions: Every oil change									
Clean air cleaner element					○						
Replace air cleaner element									●		
Inspect valve clearance		Adjust only if noisy.									
Replace spark plugs											
Replace timing belt, [NOTE 1] and inspect water pump											
Inspect and adjust drive belts									●		
Inspect idle speed*											
Replace engine coolant											
Replace transmission fluid									○		
Inspect front and rear brakes			○		●		○		●		○
Replace brake fluid											
Check parking brake adjustment					●				●		
Replace air conditioning filter [NOTE 2]									●		
Lubricate locks, hinges, and latches					○				○		
Rotate tires (Check tire inflation and condition at least once a month)			●		●		●		●		●
Inspect tie-rod ends, steering gearbox, and boots			○		●		○		●		○
Inspect suspension components			○		●		○		●		○
Inspect driveshaft boots			○		●		○		●		○
Inspect brake hoses and lines (including ABS)					●				●		
Inspect all fluid levels and condition of fluid					●				●		
Inspect cooling system hoses and connection					●				●		
Inspect exhaust system*					●				●		
Inspect fuel lines and connections*					●				●		
Check lights and controls					○				○		
Inspect vehicle under body					○				○		

NOTE:
1. If the vehicle is regularly driven in very hot or cold weather, over 110°F (43°C) or under −20°F (−29°C), replace this belt every 60,000 miles; If not, replace it at 105,000 miles.
2. Replace the air conditioning filter every 30,000 miles if the vehicle is driven mostly where air has a high concentration of soot from industry and diesel-powered vehicle; also replace it anytime airflow is less than usual.

BACK

Protected by AR

41.25	45	48.75	52.5	56.25	60	63.75	67.5	71.25	75	78.75	82.5	86.25	90	93.75	97.5	101.25	105	108.75	112.5	116.25	120
66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	175	181	187	193
—	3	—	3 1/2	—	4	—	4 1/2	—	5	—	5 1/2	—	6	—	6 1/2	—	7	—	7 1/2	—	8
Nomal Conditions: Every 7,500 miles (12,000 km) or 12 months Severe conditions: Every 3,750 miles (6,000 km) or 6 months																					
Nomal conditions: Every other oil change Severe Conditions: Every oil change																					
	○								○								○				
					●								●								●
Adjust only if noisy.																	●				
																	●				
					○												●				○
					●								●								●
																	●				
	●								●								●				
					○								●								○
	●		○		●		○		●		○		●		○		●		○		●
	●												●								
	●				●				●				●				●				●
					●								●								●
	○				○				○				○				○				○
	●		●		●		●		●		●		●		●		●		●		●
	●		○		●		○		●		○		●		○		●		○		●
	●		○		●		○		●		○		●		○		●		○		●
	●		○		●		○		●		○		●		○		●		○		●
	●				●				●				●				●				●
	●				●				●				●				●				●
	●				●				●				●				●				●
	●				●				●				●				●				●
	●				●				●				●				●				●
	○				○				○				○				○				○
	○				○				○				○				○				○

* According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended interval to ensure long-term reliability.

BACK

Maintenance Schedule for Normal Conditions (2001-2003 Models)

Listed by Distance/Time

This two-page Maintenance Schedule outlines the minimum required maintenance. Service at the indicated distance or time, whichever comes first. Use the Maintenance Schedule for Severe conditions if the vehicle meets any of the qualifiers in the Severe Conditions schedule or if the vehicle is normally driven in Canada.
According to state and federal regulations, failure to do the maintenance service items marked with an asterisk (*) will not void customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended interval to ensure long-term reliability.

7,500 mi/ 12,000 km/ —	☐ Do items in A.
15,000 mi/ 24,000 km/ 1 year	☐ Do items in A and B.
22,500 mi/ 36,000 km/—	☐ Do items in A.
30,000 mi/ 48,000 km/ 2 years	☐ Do items in A, B, and C.
37,500 mi/ 60,000 km/ —	☐ Do items in A.
45,000 mi/ 72,000 km/ 3 years	☐ Do items in A and B.
— mi/ — km/ 3 years (every 3 years independent of distance)	
☐ Replace brake fluid. Use Honda DOT 3. Fill to between the marks on the reservoir (see page 19-8).	
52,500 mi/ 84,000 km/ —	☐ Do items in A.
60,000 mi/ 96,000 km/ 4 years	☐ Do items in A, B, and C.
67,500 mi/108,000 km/ —	☐ Do items in A.
75,000 mi/ 120,000 km/ 5 years	☐ Do items in A and B.
82,500 mi/ 132,000 km/ —	☐ Do items in A.
90,000 mi/ 144,000 km/ 6 years	☐ Do items in A, B, and C.
— mi/ — km/ 6 years (every 3 years independent of distance)	
☐ Replace brake fluid. Use Honda DOT 3. Fill to between the marks on the reservoir (see page 19-8).	
97,500 mi/ 156,000 km/ —	☐ Do items in A.
105,000 mi/ 168,000 km/ 7 years	
☐ Inspect valve clearance (cold) (see page 6-13). Intake: 0.20−0.24 mm (0.008−0.009 in.), Exhaust: 0.28−0.32 mm (0.011−0.013 in.)	
☐ Replace spark plugs (see page 4-17). Use NGK (PZFR5F-11) or DENSO (PKJ 16CR-L11) for Premium model, use NGK (PZFR6E-11) or DENSO (PKJ20CR-M11) for Type-S. GAP: 1.0−1.1 mm (0.039−0.043 in)	
☐ Replace timing belt, Remove timing belt (see page 6-18), and install timing belt (see page 6-21). Inspect water pump (see page 10-12).	
☐ Check idle speed (see page 11-157). Should be 680±50 rpm in [N] or [P] position.	
☐ Do items in A and B.	
112,500 mi/ 181,000 km/ —	☐ Do items in A.
120,000 mi/ 192,000 km/ 8 years	☐ Do the items in A, B, and C.
120,000 mi/ 192,000 km/ 6 years, then every 90,000 mi/ 144,000 km/ 5 years	
☐ Replace transmission fluid (see page 14-350). Use Honda ATF-Z1. Capacity: 2.9 ℓ (3.1 US qt).	
120,000 mi/ 192,000 km/ 10 years, then every 60,000 mi/ 96,000 km/ 5 years	
☐ Replace coolant (see page 10-13). Use Honda All Season Antifreeze/Coolant Type 2. Capacity: 5.6 ℓ (5.9 US qt).	

BACK

Protected by AR

Do the items in parts A, B, and C as required for mileage/time interval listed.

A

- ☐ Replace engine oil (see page 8-5). —Capacity with filter change: 4.4 ℓ (4.6 US qt).
- ☐ Rotate tires. Follow the pattern shown in the Owner's Manual —Check tire inflation and condition.

B

- ☐ Replace engine oil filter (see page 8-5).
- ☐ Inspect front and rear brakes (see page 19-11).
  - Check pads and discs for wear (thickness), damage, and cracks.
  - Check calipers for damage, leaks, and tightness of mount bolts.
  - Check brake lining for cracking, glazing, wear and contamination.
  - Check wheel cylinders for leaks.
- ☐ Check parking brake adjustment. Should be fully applied within 2 to 4 clicks.
- ☐ Inspect tie rod ends, steering gearbox, and boots (see page 17-35).
  - Check rack grease and steering linkage.
  - Check boots for damage and leaking grease.
  - Check fluid line for damage and leaks.
- ☐ Inspect suspension components.
  - Check bolts for tightness.
  - Check condition of ball joint boots for deterioration and damage.
- ☐ Inspect driveshaft boots. Check boots for cracks and boot bands for tightness (see page 16-3).
- ☐ Inspect brake hoses and lines (including ABS). —Check the master cylinder, proportioning control valve, and ABS modulator for damage and leakage.
- ☐ Check all fluid levels and condition of fluids; check for leaks. If necessary, add ATF (see page 14-350), engine coolant, brake fluid, and windshield washer fluid.
- ☐ Inspect cooling system hoses and connections.
  - Check for damage, leaks, and deterioration.
  - Check for proper fan operation.
- ☐ Inspect exhaust system. * Check catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness (J32A1 engine (see page 9-12), J32A2 engine (see page 9-13)).
- ☐ Inspect fuel lines and connections. * Check for loose connections, cracks and deterioration; retighten loose connections and replace damaged parts (see page 11-167).

C

- ☐ Replace air cleaner element.
- ☐ Inspect and adjust drive belts, for cracks and damage.
  - Alternator, compressor belt: Inspect auto tensioner indicator. Needs no adjustment (see page 4-23).
  - P/S pump belt: Press with 98 N (10 kgf, 22 lbs) 13.0—16.5 mm (0.51—0.65 in) deflection (see page 17-15).
- ☐ Replace the dust and pollen filter (see page 21-63).
  - Replace it twice as often (at 15,000 mile interval) if the vehicle is driven mostly in urban areas that have high concentrations of soot in the air from industry and diesel-powered vehicles.
  - Replace it whenever airflow from the climate control system is less than normal.

BACK

Protected by A.P.

Maintenance Schedule for Severe Conditions (2001-2003 Models)

Listed by Distance/Time

Service at the indicated distance or time, whichever comes first. Use this schedule if the vehicle is driven MAINLY in Canada or in any of the following conditions; if only OCCASIONALLY driven in these conditions, use the Normal Conditions schedule (see page 3-10).
According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended interval to ensure long-term reliability.

Severe Driving Conditions
- Less than 5 miles (8 km) per trip or, in freezing temperatures, less than 10 miles (16 km) per trip
- In extremely; hot weather (over 90°F/32°C)
- Extensive idling or long periods of stop-and-go driving
- Trailer towing
- On muddy, dusty, or de-iced roads
- Driving in mountainous conditions

3,750 mi/ 6,000 km/ — ☐ Replace engine oil and filter.
7,500 mi/ 12,000 km/ — ☐ Do items in A.
11,250 mi/ 18,000 km/ — ☐ Replace engine oil and filter.
15,000 mi/ 24,000 km/ 1 year
☐ Clean air cleaner element with low pressure air (Premium model).
☐ Do items in A and B.
18,750 mi/ 30,000 km/ — ☐ Replace engine oil and filter.
22,500 mi/ 36,000 km/ 1 1/2 years: ☐ Do items in A.
26,250 mi/ 42,000 km/ — ☐ Replace engine oil and filter
30,000 mi/ 48,000 km/ 2 years: ☐ Do items in A, B, and C.
33,750 mi/ 54,000 km/ — ☐ Replace engine oil and filter.
37,500 mi/ 60,000 km/ 2 1/2 years: ☐ Do items in A.
41,250 mi/ 66,000 km/ — ☐ Replace engine oil and filter.
45,000 mi/ 72,000 km/ 3 years:
☐ Clean air cleaner element with low pressure air (Premium model).
☐ Do items in A and B.
— mi/ — km/ 3 years (every 3 years independent of distance)
☐ Replace brake fluid. Use Honda DOT 3. Fill to between the marks on the reservoir (see page 19-8).
48,750 mi/ 78,000 km/ — ☐ Replace engine oil and filter.
52,500mi/ 84,000 km 3 1/2 years: ☐ Do items in A.
56,250 mi/ 90,000 km/ — ☐ Replace engine oil and filter.
60,000 mi/ 96,000 km/ 4 years: ☐ Do items in A, B, and C.
60,000 mi/ 96,000 km/ —
☐ Replace timing belt.Remove timing belt (see page 6-18), install timing belt (see page 6-21). Inspect the water pump (see page 10-12) if the vehicle is regularly driven in weather over 110°F (43°C) or under −20°F (−29°C); If not, replace the belts at 105,000 miles.
60,000 mi/ 96,000 km/ 3 years, then every 30,000 mi/ 48,000 km/ 2 years
☐ Replace transmission fluid (see page 14-350). Use Honda ATF-Z1.
Capacity: 2.9 ℓ (3.1 US qt).
63,750 mi/ 102,000 km/ — ☐ Replace engine oil and filter.
67,500 mi/ 108,000 km 4 1/2 years: ☐ Do items in A.
71,250 mi/ 114,000 km/ — ☐ Replace engine oil and filter.
75,000mi/ 120,000 km/ 5 years:
☐ Clean air cleaner element with low pressure air (Premium model).
☐ Do items in A and B.
78,750 mi/ 126,000 km/ — ☐ Replace engine oil and filter.
82,500 mi/ 132,000 km/ 5 1/2 years ☐ Do items in A.
86,250 mi/ 138,000 km/ — ☐ Replace engine oil and filter.
90,000 mi/ 144,000 km/ 5 years, then every 30,000 mi/ 48,000 km/ 2 years
☐ Replace transmission fluid (see page 14-350). Use Honda ATF-Z1.
Capacity: 2.9 ℓ (3.1 US qt).
90,000 mi/ 144,000 km/ 6 years: ☐ Do items in A, B, and C.
— mi/ — km/ 6 years (every 3 years independent of distance)
☐ Replace brake fluid. Use Honda DOT 3. Fill to between the marks on the reservoir (see page 19-8).
93,750 mi/ 150,000 km/ — ☐ Replace engine oil and filter.
97,500 mi/ 156,000 km/ 6 1/2 years: ☐ Do items in A.
101,250 mi/ 162,000 km/ — ☐ Replace engine oil and filter.
105,000 mi/ 168,000 km/ 7 years:
☐ Clean air cleaner element with low pressure air (Premium model).
☐ Inspect valve clearance (cold) (see page 6-13) Intake: 0.20−0.24 mm (0.008−0.009 in.) Exhaust: 0.28−0.32 mm (0.011−0.013 in.)
☐ Replace spark plugs (see page 4-17). Use NGK (PZFR5F-11) or DENSO (PKJ16CR-L11) except for Type-S, use NGK (PZFR6E-11) or DENSO (PKJ20CR-M11) for Type-S. Gap: 1.0−1.1 mm (0.039−0.043 in).
☐ Replace timing belt. Remove timing belt (see page 6-18), install timing belt (see page 6-21). Inspect the water pump (see page 10-12) only if the belts was not replaced at 60,000 miles.
☐ Check idle speed (see page 11-157). Should be 680±50 rpm in N or P position.
☐ Do items in A and B.
108,750 mi/ 174,000 km/ — ☐ Replace engine oil and filter.
112,500 mi/ 180,000 km/ 7 1/2 years: ☐ Do items in A.
116,250 mi/ 186,000 km/ — ☐ Replace engine oil and filter.

BACK

Protected by AR

120,000 mi/ 192,000 km/ 8 years:
- ☐ Do items A, B, and C.
- ☐ Replace timing belt.Remove timing belt (see page 6-18), install timing belt (see page 6-21), Inspect the water pump (see page 10-12) only if the belts was replaced at 60,000 miles.

120,000 mi/ 192,000 km/ 7 years, then every 30,000 mi/ 48,000 km/ 2 years
- ☐ Replace transmission fluid (see page 14-350). Use Honda ATF-Z1. Capacity: 2.9 ℓ (3.1 US qt).

120,000 mi/ 192,000 km/or 10 years, then every 60,000 mi/ 96,000 km/ 5 years
- ☐ Replace engine coolant (see page 10-13). Use Honda All Season Antifreeze/Coolant Type 2. Capacity: 5.6 ℓ (5.9 US qt).

Do the items in parts A, B, and C as required for mileage/time interval.

A
- ☐ Replace engine oil and filter (see page 8-5). — Capacity with filter change: 4.4 ℓ (4.6 US qt).
- ☐ Inspect front and rear brakes (see page 19-11).
  - Check pads and discs for wear (thickness), damage, and cracks.
  - Check calipers for damage, leaks, and tightness of mount bolts.
- ☐ Rotate tires, if the vehicle has been driven the distance listed. Follow the pattern shown in the Owner's Manual. (Check tire inflation and condition.)
- ☐ Inspect tie rod ends, steering gearbox, and boots (see page 17-35).
  - Check rack grease and steering linkage.
  - Check boots for damage and leaking grease.
  - Check fluid lines for damage and leaks.
  - Check brake lining for cracking, glazing, wear, and contamination.
  - Check wheel cylinders for leaks.
- ☐ Inspect suspension components.
  - Check bolts for tightness.
  - Check condition of ball joint boots for deterioration and damage.
- ☐ Inspect driveshaft boots. Check boots for cracks and boot bands for tightness (see page 16-3).

B
- ☐ Replace air cleaner element (Type-S model).
- ☐ Check parking brake adjustment. — Should be fully applied within 2 to 4 clicks.
- ☐ Lubricate locks, latches, and hinges with Honda white lithium grease.
- ☐ Inspect brake hoses and lines (including ABS). Check the master cylinder, proportioning control valve, and ABS modulator for damage and leakage (see page 19-30).
- ☐ Check fluid levels and condition of fluids; check for leaks. If necessary, add ATF (see page 14-350), engine coolant, brake fluid, and windshield washer fluid.
- ☐ Inspect cooling system hoses and connections.
  - Check for damage, leaks, and deterioration.
  - Check for proper fan operation.
- ☐ Inspect exhaust system. * Check catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness(J32A1 engine (see page 9-12), J32A2 engine (see page 9-13)).
- ☐ Inspect fuel lines and connections. * Check for loose connections, cracks and deterioration; retighten loose connections and replace damaged parts (see page 11-167).
- ☐ Check all lights. Check function of all interior and exterior lights, and the positions of the headlights (see page 22-142).
- ☐ Inspect the vehicle underbody. Check the paint for damage, scratches, stone chipping, and dents.

C
- ☐ Replace air cleaner element in dusty conditions, otherwise use Normal Conditions schedule (Premium model).
- ☐ Inspect and adjust drive belts, for cracks and damage.
  - Alternator, compressor belt: Inspect auto tensioner indicator. Needs no adjustment (see page 4-23).
  - P/S pump belt: Press with 98 N (10 kgf, 22 lbs) 13.0 – 16.5 mm (0.51 – 0.65 in) deflection (see page 17-15).
- ☐ Replace dust and pollen filter, every 15,000 miles if vehicle is driven mostly where air has high concentration of soot from industry and diesel-powered vehicles; also replace it anytime airflow is less than usual (see page 21-63).

BACK

Protected by AP

Maintenance Schedule for Normal and Severe Conditions (2001-2003 Models)

Listed by Maintenance Item

Service at the indicated distance or time, whichever comes first.
- If driven in normal conditions, do items with a dot (●).
- If driven in severe conditions (see page 3-12) or normally driven in Canada, do items with a circle (○) and items with a dot (●).

Service at the indicated distance or time, whichever comes first.		miles x 1000	3.75	7.5	11.25	15	18.75	22.5	26.25	30	33.75	37.5
		km x 1000	6	12	18	24	30	36	42	48	54	60
		years	—	1/2	—	1	—	1 1/2	—	2	—	2 1/2
Replace engine oil			Normal Conditions: Every 7,500 miles (12,000 km) or 1 year Severe Conditions: Every 3,750 miles (6,000 km) or 6 months									
Replace engine oil filter			Normal Conditions: Every 15,000 miles (24,000 km) or 1 year Severe Conditions: Every 3,750 miles (6,000 km) or 6 months									
Replace air cleaner element (Type-S model)			Normal Conditions: Every 30,000 miles (48,000 km) or 2 years Dusty Conditions: Every 15,000 miles (24,000 km) or 1year									
Check engine oil and coolant			Check oil and coolant each fuel stop									
Clean or replace air cleaner element (Premium model) -Use normal conditions except in dusty conditions			Normal Conditions: Replace every 30,000 miles (48,000 km) or 2 years Dusty Conditions: Clean at 15,000 miles (24,000 km) or 1 year, 45,000 miles (72,000 km) or 3 years, 75,000 miles (120,000 km) or 5 years, 105,000 miles (168,000 km) or 7 years. Replace every 30,000 miles (48,000 km) or 2 years.									
Inspect valve clearance			Adjust only if noisy.									
Replace spark plugs												
Replace timing belt, NOTE 1 and inspect water pump												
Inspect and adjust drive belts										●		
Inspect idle speed*												
Replace engine coolant	'01 model		Normal Conditions: At 120,000 miles (192,000 km) or 10 years, then every 60,000 miles (96,000 km) or 5 years Severe Conditions: At 120,000 miles (192,000 km)or 6 years, then every 60,000 miles (96,000 km) or 5 years									
	'02-03 models		At 120,000 miles (192,000 km) or 10 years, then every 60,000 miles (96,000 km) or 5 years									
Replace transmission fluid			Normal Conditions: At 120,000 miles (192,000 km) or 6 years, then every 90,000 miles (144,000 km) or 5 years Severe Conditions: At 60,000 miles (96,000 km) or 3 years, then every 30,000 miles (48,000 km) or 2 years									
Inspect front and rear brakes				○		●		○		●		○
Replace brake fluid			Every 3 years (independent of distance)									
Check parking brake adjustment						●				●		
Replace dust and pollen filter NOTE 2										●		
Lubricate locks, latches, and hinges						○				○		
Rotate tires (Check tire inflation and condition at least once a month)			Every 7,500 miles (12,000 km)									
Inspect tie-rod ends, steering gearbox, and boots				○		●		○		●		○
Inspect suspension components				○		●		○		●		○
Inspect driveshaft boots				○		●		○		●		○
Inspect brake hoses and lines (including ABS)						●				●		
Inspect all fluid levels and condition of fluids						●				●		
Inspect cooling system hoses and connections						●				●		
Inspect exhaust system*						●				●		
Inspect fuel lines and connections*						●				●		
Check lights and controls						○				○		
Inspect vehicle underbody						○				○		

NOTE:
1. If the vehicle is regularly driven in very hot or cold weather, over 110°F (43°C) or under −20°F (−29°C), replace this belt at 60,000 miles (96,000 km); If not, replace it at 105,000 miles (168,000 km).
2. Replace the dust and pollen filter every 15,000 miles if the vehicle is driven mostly where air has a high concentration of soot from industry and diesel-powered vehicle; also replace it anytime airflow is less than usual.

* According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended interval to ensure long-term reliability.

BACK

Protected by AR

41.25	45	48.75	52.5	56.25	60	63.75	67.5	71.25	75	78.75	82.5	86.25	90	93.75	97.5	101.25	105	108.75	112.5	116.25	120
66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192
—	3	—	3 1/2	—	4	—	4 1/2	—	5	—	5 1/2	—	6	—	6 1/2	—	7	—	7 1/2	—	8
Normal Conditions: Every 7,500 miles (12,000 km) or 1 year Severe Conditions: Every 3,750 miles (6,000 km) or 6 months																					
Normal Conditions: 15.000 miles (24,000 km) or 1 year Severe Conditions: 3.750 miles (6,000 km) or 6 months																					
Check oil and coolant each fuel stop																					
Normal Condition: Every 30,000 miles (48,000 km) or 2 years Dusty Condition: Every 15,000miles (24,000 km) or 1 year																					
Normal Condition: Replace every 30,000 miles (48,000 km) or 2 years Dusty Conditions: Clean at 15,000 miles (24,000 km) or 1 year, 45,000 miles (72,000 km) or 3 years, 75,000 miles (120,000 km) or 5 years, 105,000 miles (168,000 km) or 7 years. Replace every 30,000 miles (48,000 km) or 2 years.																					
Adjust only if noisy.																	●				
																	●				
					○												●				○
					●								●								●
																	●				
Normal Conditions: At 120,000 miles (192,000 km) or 10 years, then every 60,000 miles (96,000 km) or 5 years Severe Conditions: At 120,000 miles (192,000 km) or 6 years, then every 60,000 miles (96,000 km) or 5 years																					
At 120,000 miles (192,000 km) or 10 years, then every 60,000 miles (96,000 km) or 5 years																					
Normal Conditions: At 120,000 miles (192,000 km) or 6 years, then every 90,000 miles (144,000 km) or 5 years Severe Conditions: At 60,000 miles (96,000 km) or 3 years, then every 30,000 miles (48,000 km) or 2 years																					
	●		○		●		○		●		○		●		○		●		○		●
Every 3 years (independent of distance)																					
	●				●				●				●				●				●
					●								●								●
	○				○				○				○				○				○
Every 7,500 miles (12,000 km)																					
	●		○		●		○		●		○		●		○		●		○		●
	●		○		●		○		●		○		●		○		●		○		●
	●		○		●		○		●		○		●		○		●		○		●
	●				●				●				●				●				●
	●				●				●				●				●				●
	●				●				●				●				●				●
	●				●				●				●				●				●
	●				●				●				●				●				●
	○				○				○				○				○				○
	○				○				○				○				○				○

BACK

Protected by AR

Engine Electrical

Engine Electrical
Special Tools 4-2

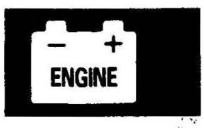
Starting System
Component Location Index 4-3
Circuit Diagram 4-4
Starter Circuit Troubleshooting 4-5
Starter Solenoid Test 4-6
Starter Performance Test 4-7
Starter Replacement 4-8
Starter Overhaul 4-9

Ignition System
Component Location Index 4-14
Circuit Diagram 4-15
Ignition Timing Inspection 4-16
Spark Plug Inspection 4-17

Charging System
Component Location Index 4-18
Circuit Diagram 4-19
Charging Circuit Troubleshooting 4-20
Alternator-Compressor Belt Inspection and Replacement 4-23
Alternator Replacement 4-23
Auto-Tensioner Inspection/Replacement 4-24
Alternator Overhaul 4-27

Cruise Control
Component Location Index 4-33
Circuit Diagram 4-34
Symptom Troubleshooting Index 4-35
Cruise Control Communication Circuit Troubleshooting 4-37
Control Unit Input Test 4-38
Brake Pedal Position Switch Test 4-40
Main Switch Test/Replacement 4-40
Set/Resume/Cancel Switch Test/Replacement 4-41
Actuator Test 4-42
Actuator/Cable Replacement 4-43
Actuator Cable Adjustment 4-44

Engine Mount Control System
Component Location Index 4-45
Circuit Diagram 4-46
Troubleshooting 4-47



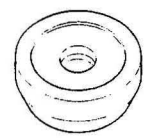
Protected by AR

Special Tools

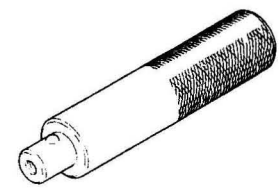
Number	Tool Number	Description	Qty
①	A973X-041-XXXXX	Vacuum Pump/Gauge, 0−30 in.Hg	1
②	07746-0010400	Attachment, 52 x 55 mm	1
③	07749-0010000	Driver	1



①



②

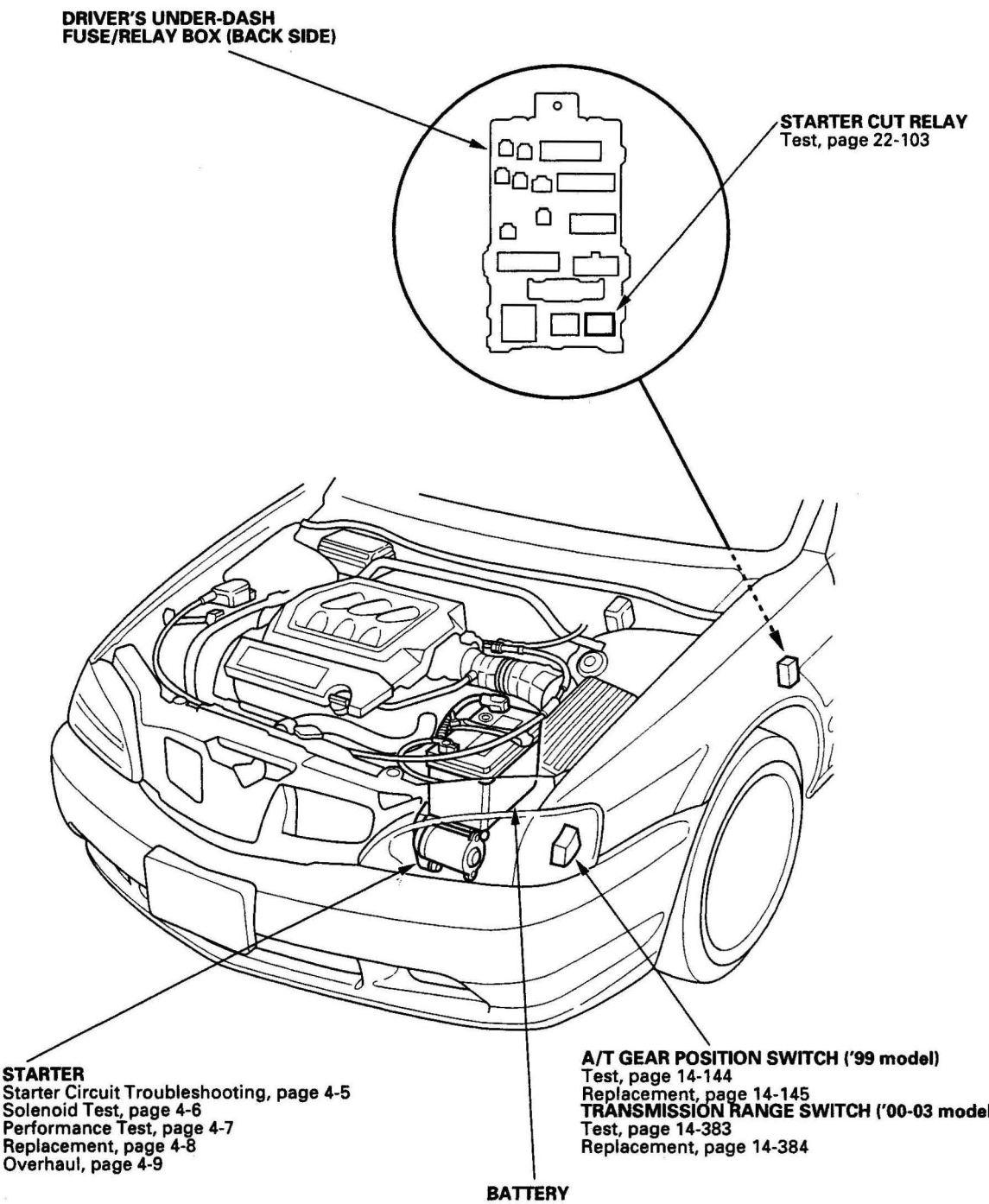


③

BACK

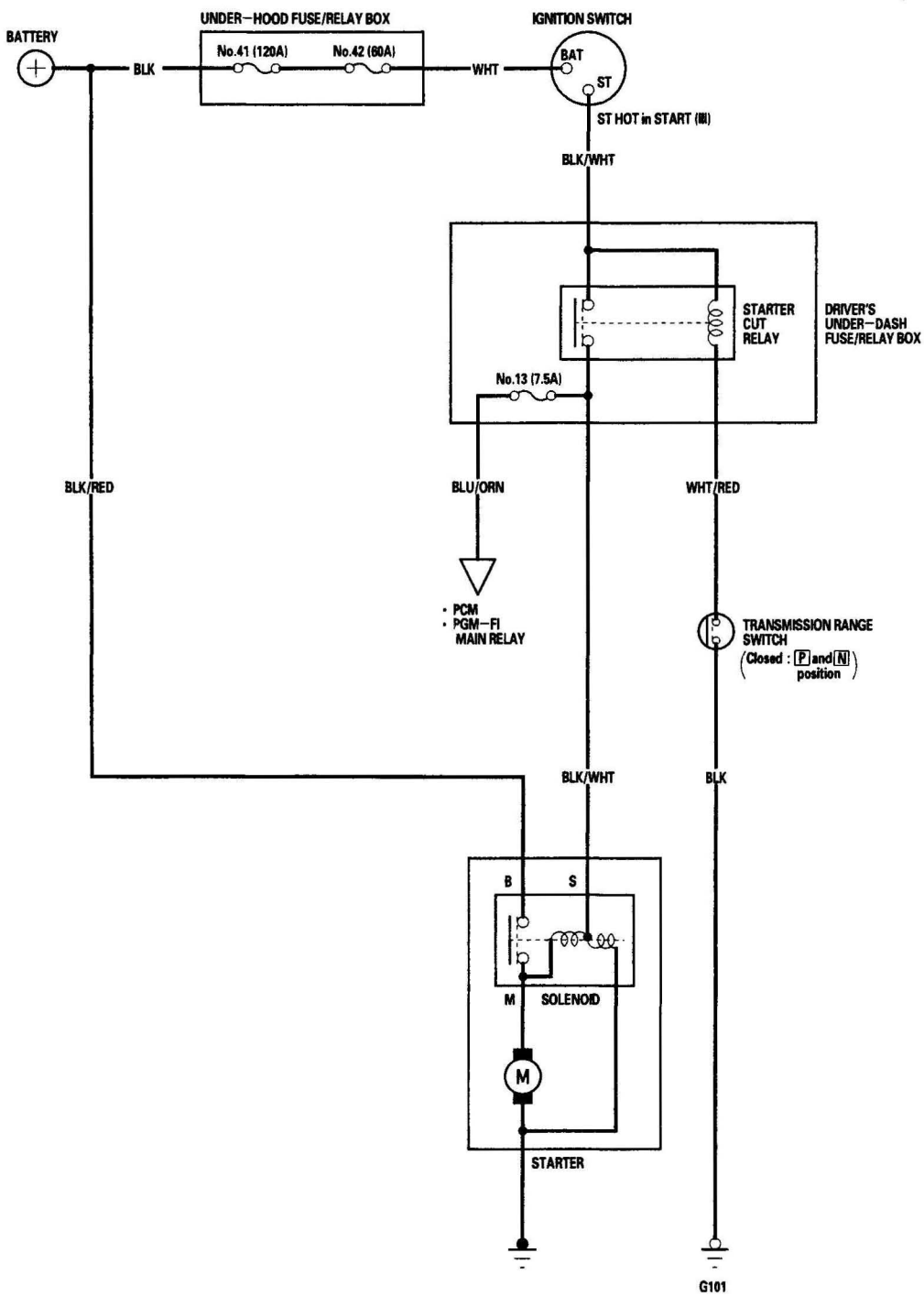
Protected by AR

Component Location Index



Protected by AR

Circuit Diagram



BACK

Protected by AR

Starter Circuit Troubleshooting

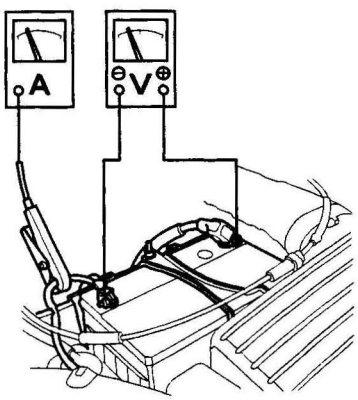
NOTE:
- Air temperature must be between 59° and 100°F (15° and 38°C) during this procedure.
- After this test, or any subsequent repair, reset the powertrain control module (PCM) to clear any codes (see page 11-4).
- The battery must be installed in good condition and fully charged.

Recommended Procedure:
- Use a starter system tester.
- Connect and operate the equipment in accordance with the manufacturer's instructions.

Alternate Procedure

1. Hook up the following equipment:

   - Ammeter, 0—400 A
   - Voltmeter, 0—20 V (accurate within 0.1 volt)
   - Tachometer, 0—1200 rpm



2. Remove the No. 1 FUEL PUMP (15A) fuse from the driver's under-dash fuse/relay box.

3. With the shift lever in Park or Neutral, turn the ignition switch to start (III).

   Did the starter crank the engine normally?

   YES—The starting system is OK.■

   NO—If the starter will not crank the engine at all, go to step 4. If it cranks the engine erratically or too slowly, go to step 7. If it won't disengage from the torque converter ring gear when you release the key, check for the following until you find the cause.

   - Solenoid plunger and switch malfunction
   - Dirty drive gear or damaged overrunning clutch.

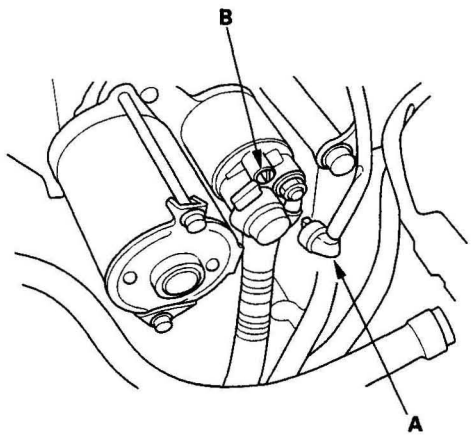
4. Check the battery condition. Check electrical connections at the battery, the negative battery cable to body, the engine ground cables and the starter for looseness and corrosion. Then try starting the engine again.

   Did the starter crank the engine?

   YES—Repairing the loose connection repaired the problem. The starting system is OK.■

   NO—Go to step 5.

5. Make sure the transmission is in Park or Neutral, then disconnect the BLK/WHT wire (A) from the starter solenoid (B). Connect a jumper wire from the battery positive terminal to the solenoid terminal.



   Did the starter crank the engine?

   YES—Go to step 6.

   NO—Remove the starter and repair or replace as necessary.

6. Check the following items in the order listed until you find the open circuit.

   - Check the BLK/WHT wire and connectors between the driver's under-dash fuse/relay box and the ignition switch, and between the driver's under-dash fuse/relay box and the starter.
   - Check the ignition switch (see page 22-191).
   - Check the A/T gear position switch ('99 model)/ transmission range switch ('00-03 models) and connector.
   - Check the starter cut relay.

(cont'd)

Protected by AR

Starter Circuit Troubleshooting (cont'd)

7. Check engine speed while cranking the engine.

   Is engine speed above 100 rpm?

   YES – Go to step 8.

   NO – Replace the starter, or remove and disassemble it, and check for the following until you find the cause.

   - Excessively worn starter brushes
   - Open circuit in commutator brushes
   - Dirty or damaged helical spline or drive gear
   - Faulty drive gear clutch

8. Check the cranking voltage and current draw.

   Is cranking voltage greater than or equal to 8.5 V, and current draw less than or equal to 380A?

   YES – Go to step 9.

   NO – Replace the starter, or remove and disassemble it, and check for the following until you find the cause.

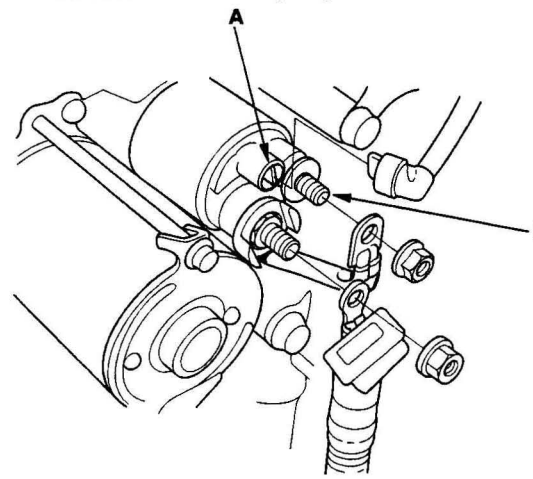
   - Open circuit in starter armature commutator segments
   - Starter armature dragging
   - Shorted armature winding
   - Excessive drag in engine

9. Remove the starter and inspect its drive gear and the torque converter ring gear for damage. Replace any damaged parts.■

Starter Solenoid Test

1. Check the hold-in coil for continuity between the S terminal (A) and the armature housing (ground). There should be continuity.

   - If there is continuity, go to step 2.
   - If there is no continuity, replace the solenoid.



2. Check the pull-in coil for continuity between the S terminal (A) and M terminal (B). There should be continuity.

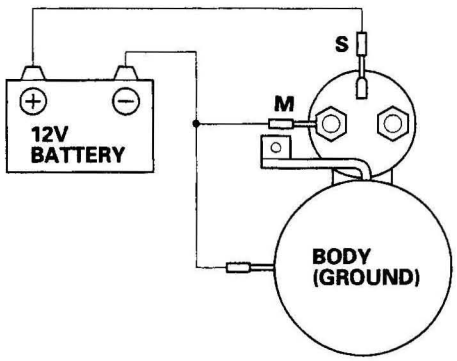
   - If there is continuity, the solenoid is OK.
   - If there is no continuity, replace the solenoid.

BACK

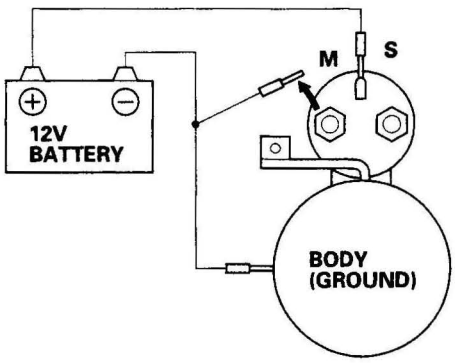
Protected by AR

Starter Performance Test

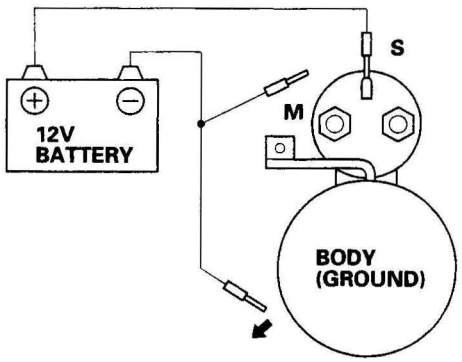
1. Disconnect the wires from the S terminal and the M terminal.
2. Make a connections as described below using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle). To avoid damaging the starter, never leave the battery connected for more than 10 seconds.
3. Connect the battery as shown. Be sure to disconnect the starter motor wire from the solenoid. If the starter pinion moves out, it is working properly.



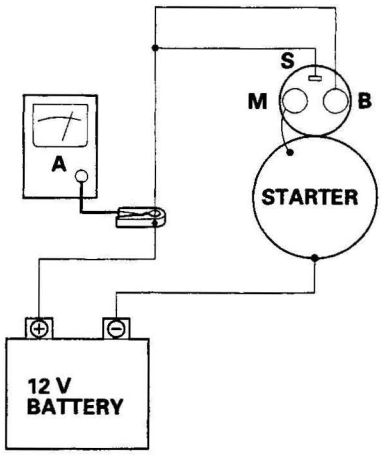
4. Disconnect the battery from the M terminal. If the pinion does not retract, the hold-in coil of the solenoid is working properly.



5. Disconnect the battery from the body. If the pinion retracts immediately, it is working properly.



6. Remove the starter (see page 4-8).
7. Clamp the starter firmly in a vise.
8. Connect the starter to the battery as described in the diagram below, and confirm that the motor starts and keeps rotating.



9. If the electric current and motor speed meet the specifications when the battery voltage is at 11.5 V, the starter is working properly.

Specifications:

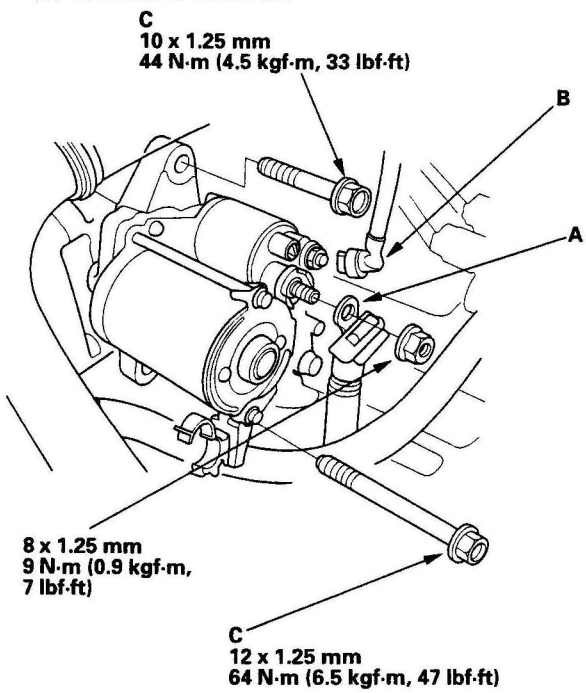
1.6 kw	**80 A or less (Electric current), 2,600 rpm or more (Motor-speed)**

BACK

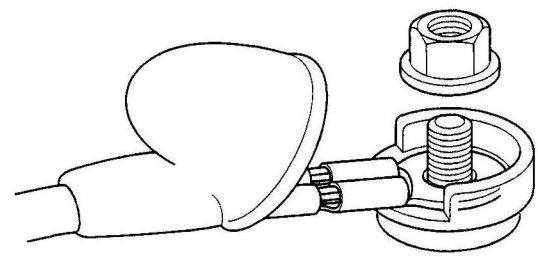
Protected by AR

Starter Replacement

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable, then disconnect the positive cable.
3. Remove the ATF cooler hose from the clamp on the starter motor ('99-01 models).
4. Disconnect the starter cable (A) from the B terminal on the solenoid, then disconnect the BLK/WHT wire (B) from the S terminal.



5. Remove the two bolts (C) holding the starter, then remove the starter.
6. Install in the reverse order of removal. Make sure the crimped side of the ring terminal is facing out.



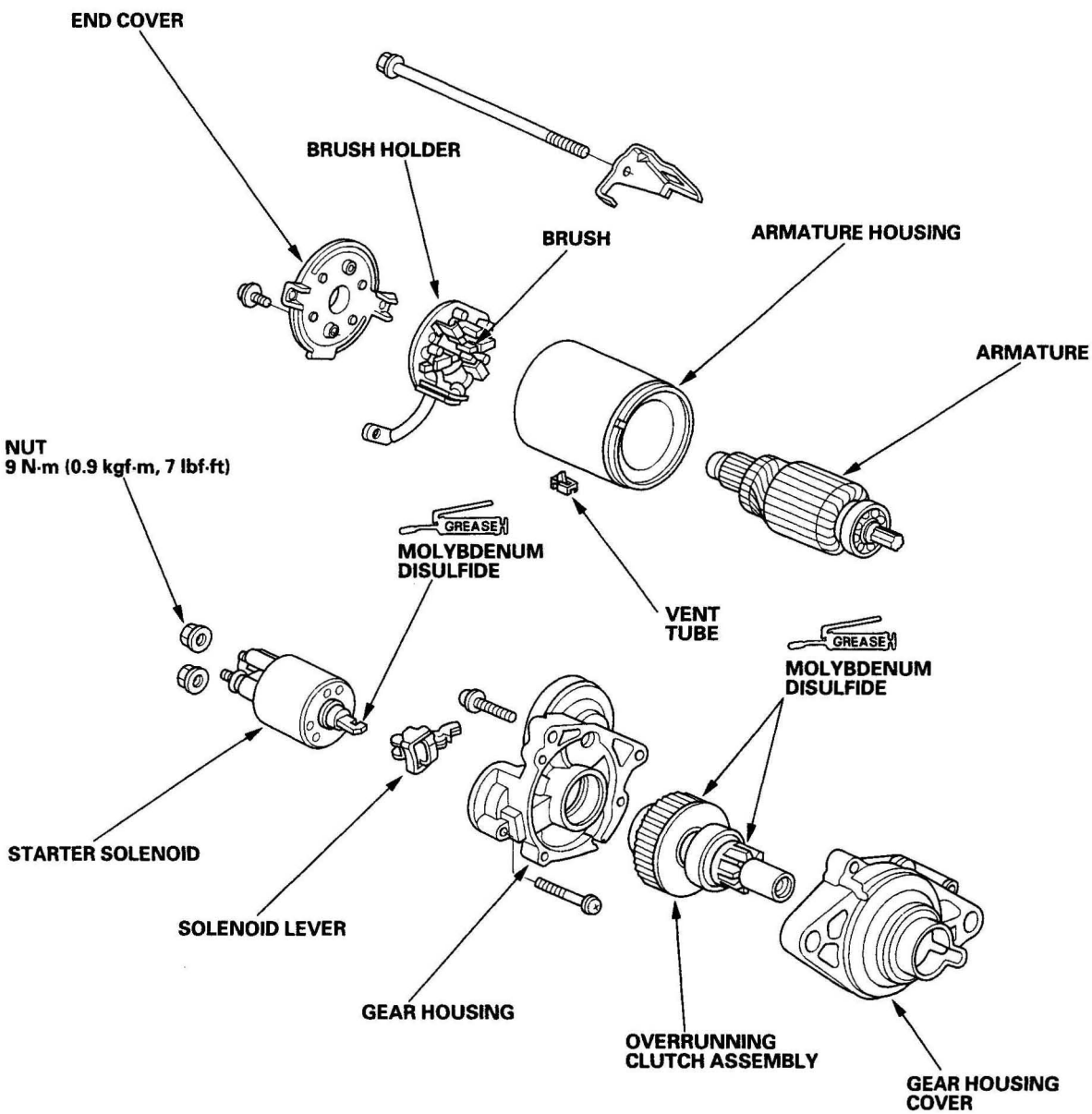
7. Connect the battery positive cable and negative cable to the battery.
8. Start the engine to make sure the starter works properly.
9. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's radio station presets.
10. Perform the powertrain control module (PCM) idle learn procedure (see page 11-158).
11. Perform the power window control unit reset procedure ('02-03 models) (see page 22-308).

BACK

Protected by AR

Starter Overhaul

Disassembly/Reassembly



(cont'd)

Protected by AR

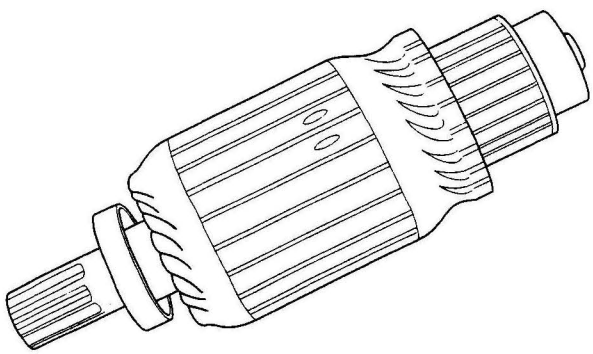
Starter Overhaul (cont'd)

1. Remove the starter (see page 4-8).

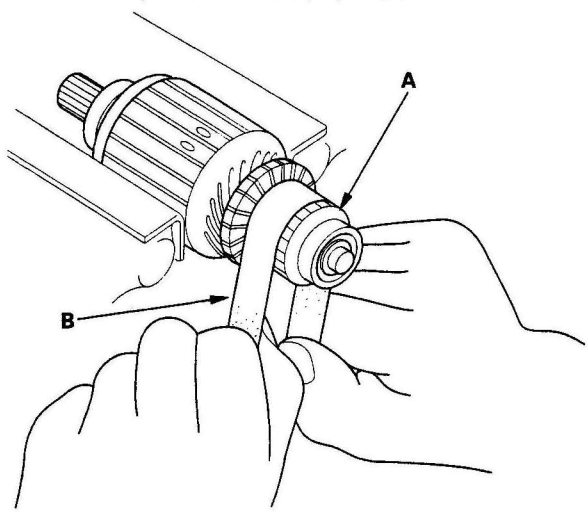
2. Disassemble the starter as shown at the beginning of this procedure.

Armature Inspection and Test

3. Inspect the armature for wear or damage from contact with the permanent magnet. If there is wear or damage, replace the armature.

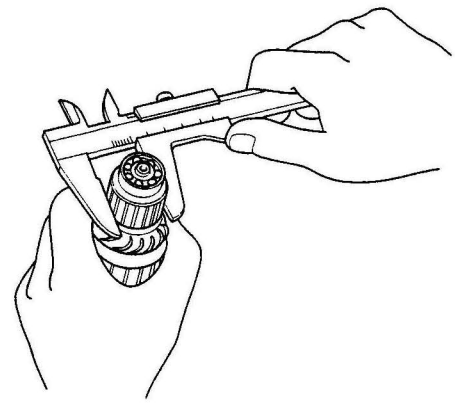


4. Check the commutator (A) surface. If the surface is dirty or burnt, resurface with emery cloth or a lathe within the following specifications, or recondition with # 500 or # 600 sandpaper (B).



5. Check the commutator diameter. If the diameter is below the service limit, replace the armature.

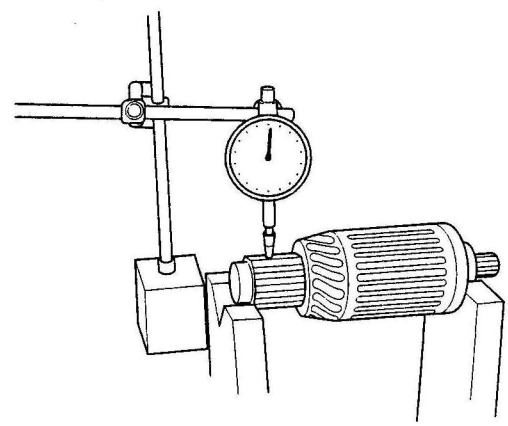
Commutator Diameter
Standard (New): 28.0—28.1 mm (1.102—1.106 in.)
Service Limit: 27.5 mm (1.083 in.)



6. Measure the commutator runout.

- If the commutator runout is within the service limit, check the commutator for carbon dust or brass chips between the segments.
- If the commutator runout is not within the service limit, replace the armature.

Commutator Runout
Standard (New): 0.02 mm (0.001 in.) max.
Service Limit: 0.05 mm (0.002 in.)

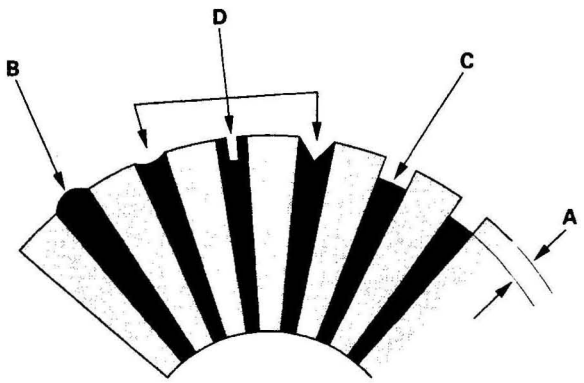


BACK

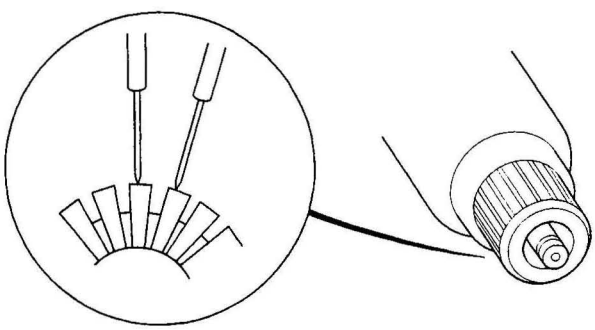
Protected by AR

7. Check the mica depth (A). If the mica is too high (B), undercut the mica with a hacksaw blade to the proper depth. Cut away all the mica (C) between the commutator segments. The undercut should not be too shallow, too narrow, or V-shaped (D).

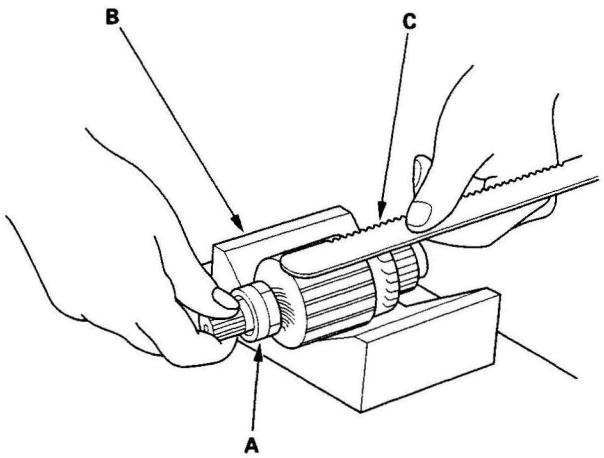
Commutator Mica Depth
Standard (New): 0.4—0.5 mm (0.016—0.020 in.)
Service Limit: 0.15 mm (0.006 in.)



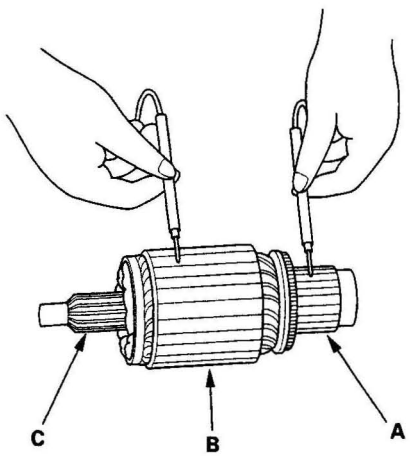
8. Check for continuity between the segments of the commutator. If an open circuit exists between any segments, replace the armature.



9. Place the armature (A) on an armature tester (B). Hold a hacksaw blade (C) on the armature core. If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.



10. Check with an ohmmeter that no continuity exists between the commutator (A) and armature coil core (B), and between the commutator and armature shaft (C). If continuity exists, replace the armature.



(cont'd)

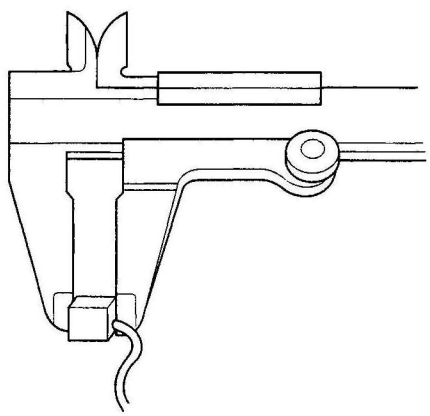
Protected by AR

Starter Overhaul (cont'd)

Starter Brush Inspection

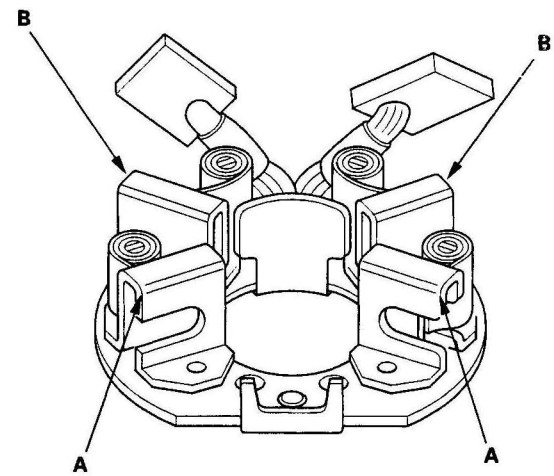
11. Measure the brush length. If it is not within the service limit, replace the brush holder assembly.

Brush Length
Standard (New): 15.8–16.2 mm (0.62–0.64 in.)
Service Limit: 11.0 mm (0.43 in.)



Starter Brush Holder Test

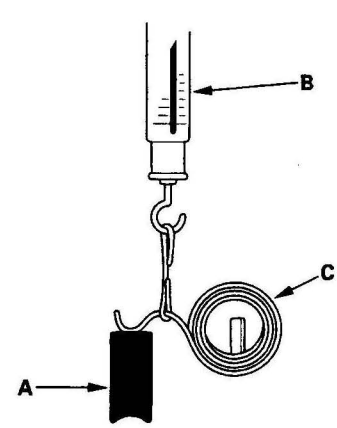
12. Check that there is no continuity between the (+) brush holder (A) and (–) brush holder (B). If there is continuity, replace the brush holder assembly.



Brush Spring Inspection

13. Insert the brush (A) into the brush holder, and bring the brush into contact with the commutator, then attach a spring scale (B) to the spring (C). Measure the spring tension at the moment the spring lifts off the brush. If the spring tension is not within specification, replace the spring.

Spring Tension:
15.7–17.7 N (1.6–1.8 kgf, 3.53–3.97 lbf)

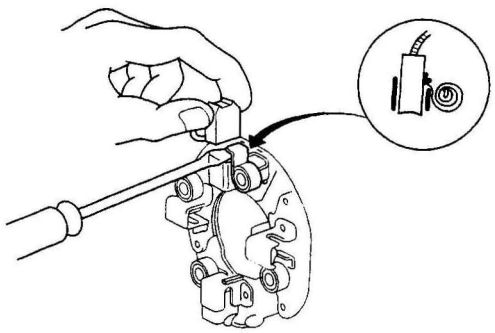


BACK

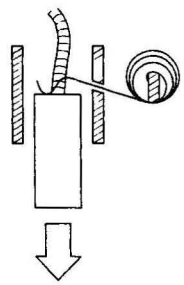
Protected by AR

14. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.

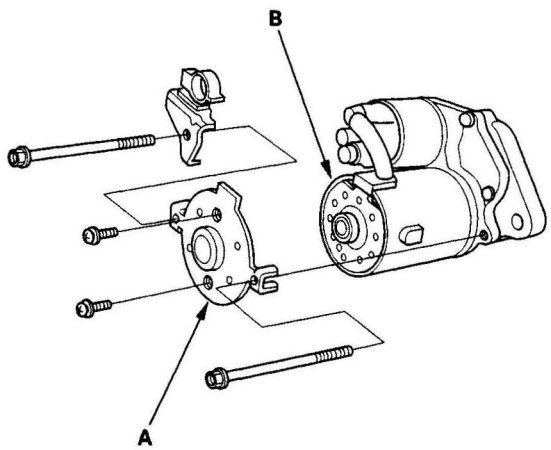
    NOTE: To seat new brushes, slip a strip of # 500 or # 600 sandpaper, with the grit side up, between the commutator and each brush, and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.



15. Install the armature in the housing. Next, pry back each brush spring again, and push the brush down until it seats against the commutator, then release the spring against the end of the brush.



16. Install the starter end cover (A) to retain the brush holder (B).



Overrunning Clutch Inspection

17. Slide the overrunning clutch along the shaft. Replace it if it does not slide smoothly.

18. Rotate the overrunning clutch (A) both ways. If it does not lock in either direction or it locks in both directions, replace it.



19. If the starter drive gear (B) is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.

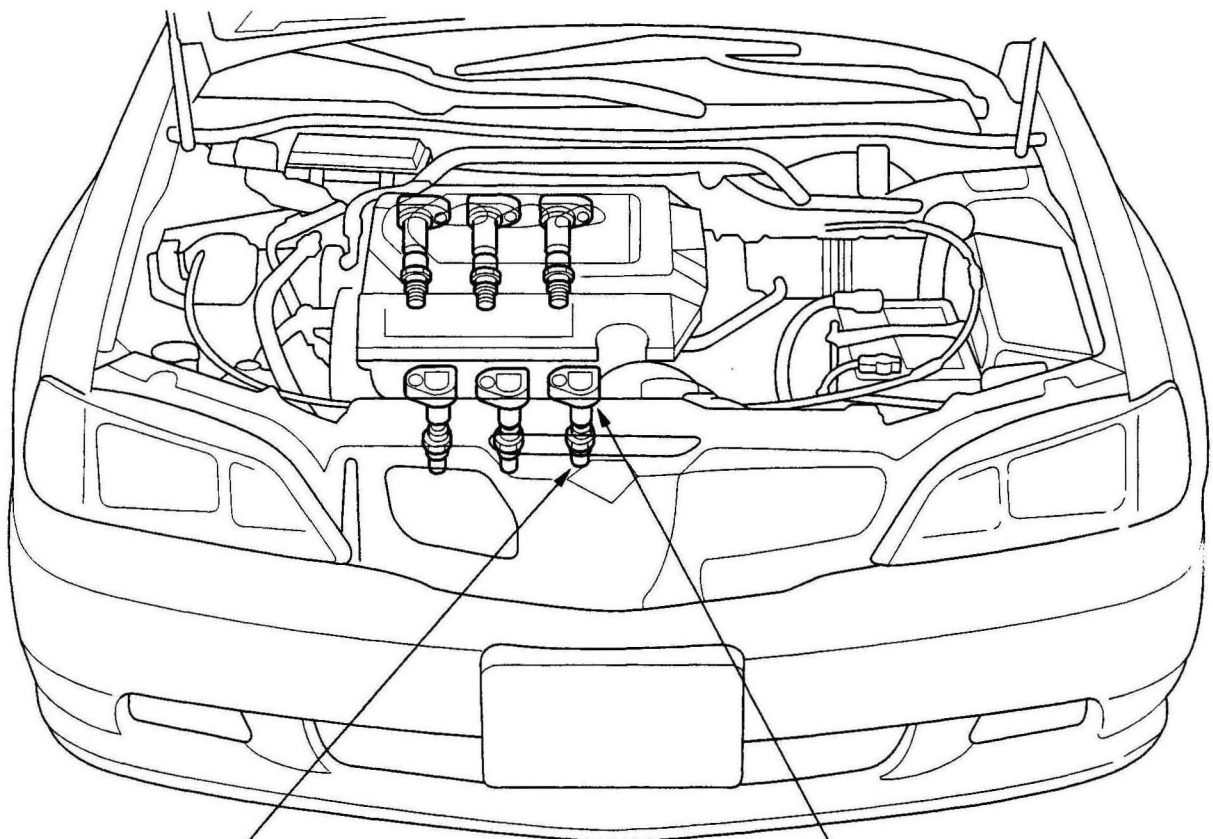
    Check the condition of the torque converter ring gear to see if the starter drive gear teeth are damaged.

20. Reassemble the starter in the reverse order of disassembly.

BACK

Protected by AR

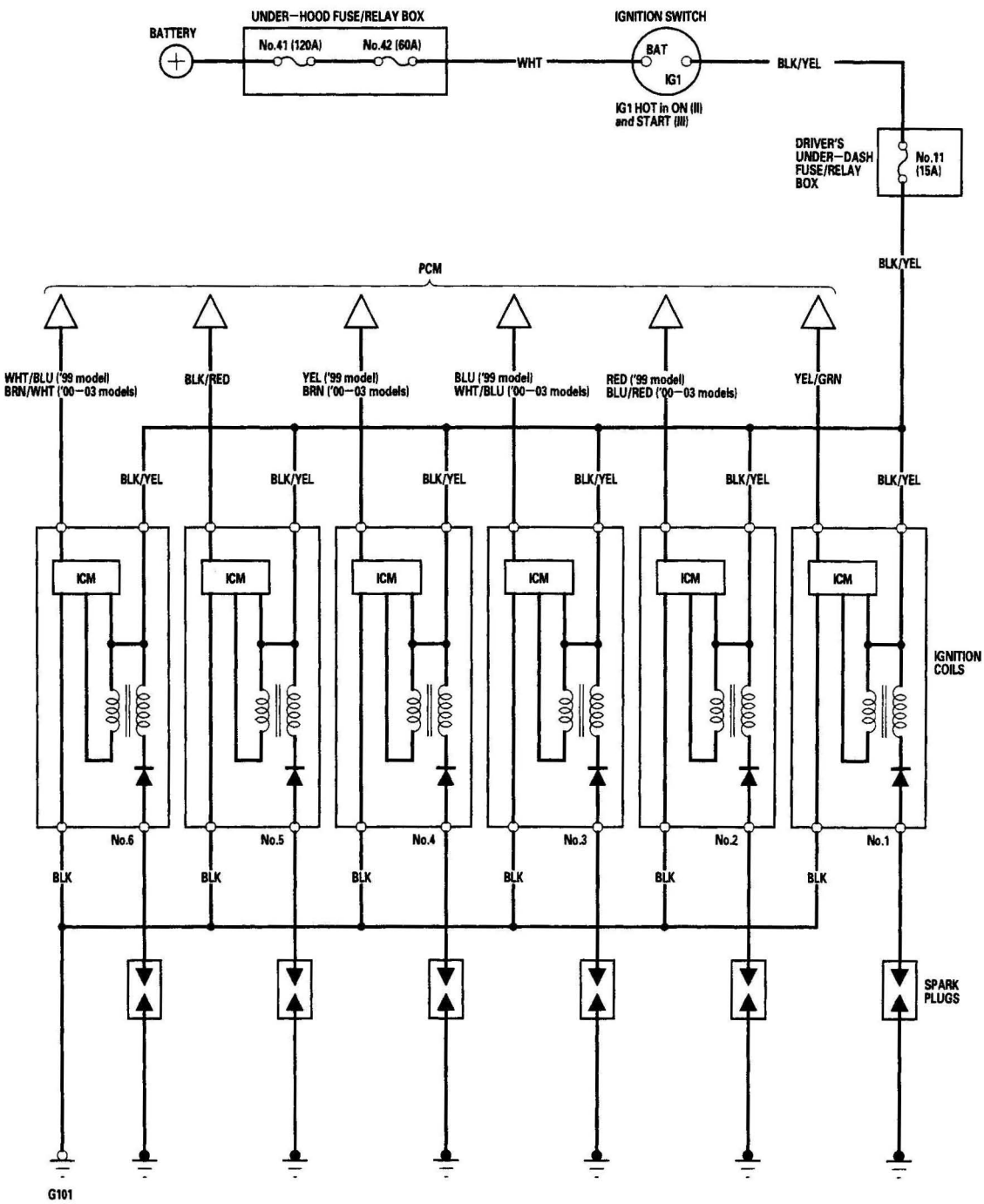
Component Location Index



BACK

Protected by AR

Circuit Diagram



ICM : Ignition Control Module

BACK

Protected by AR

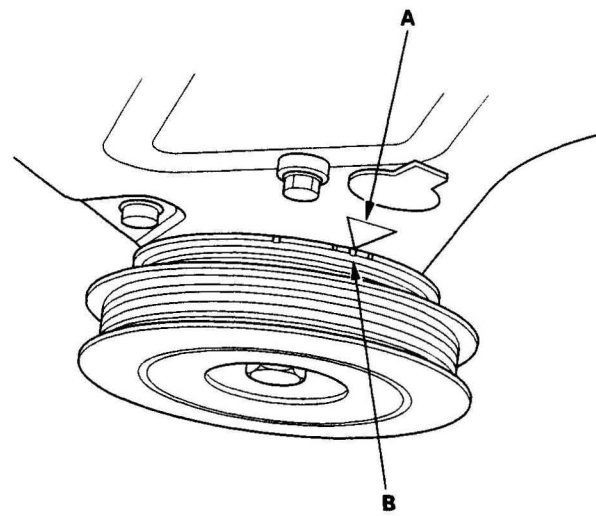
Ignition Timing Inspection

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or Neutral) until the radiator fan comes on, then let it idle.
2. Check the idle speed, and adjust it if necessary (see page 11-157).
3. Connect the Honda PGM Tester to the data link connector (DLC), and follow the tester's prompts in the "SCS" menu (see the Honda PGM Tester Operator's Manual).
4. Connect the timing light to the No. 1 ignition coil wire.



5. Point the light toward the pointer (A) on the timing belt cover. Check the ignition timing under no load conditions: headlights, blower fan, rear window defogger, and air conditioner are not operating. If the ignition timing differs from the specification below, replace the powertrain control module (PCM) (see page 11-4).

Ignition Timing:
10° ±2° BTDC (RED mark (B)) at idle in Park or Neutral



6. Disconnect the Honda PGM Tester.

BACK

Protected by AR

Spark Plug Inspection

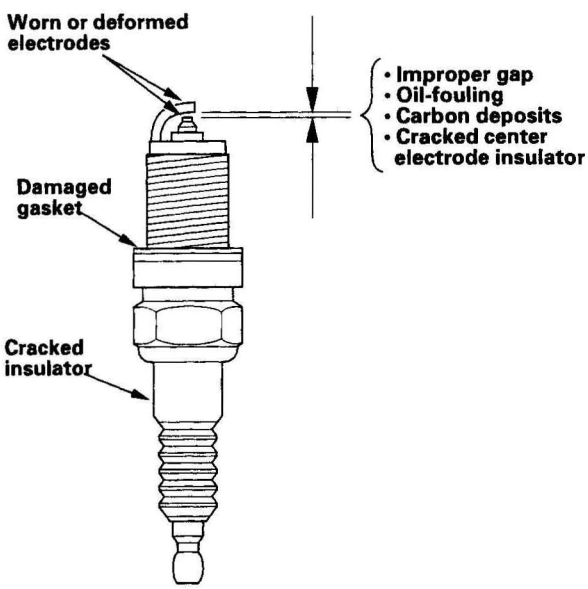
1. Inspect the electrodes and ceramic insulator.

   Burned or worn electrodes may be caused by:

   - Advanced ignition timing
   - Loose spark plug
   - Plug heat range too hot
   - Insufficient cooling

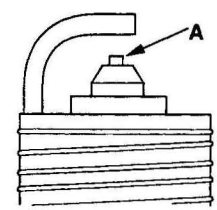
   Fouled plug may be caused by:

   - Retarded ignition timing
   - Oil in combustion chamber
   - Incorrect spark plug gap
   - Plug heat range too cold
   - Excessive idling/low speed running
   - Clogged air cleaner element
   - Deteriorated ignition coils



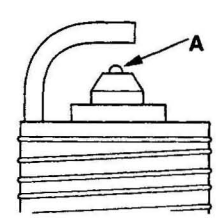
2. Do not adjust the gap of platinum tip plugs (A); replace the spark plug if the gap is out of specification.

   Electrode Gap:
   Standard (New): 1.0–1.1 mm (0.039–0.043 in.)
   Service Limit: 1.3 mm (0.051 in.)



3. Replace the plug at the specified interval, or if the center electrode is rounded (A). Use only the spark plugs listed below.

   Spark Plugs:
   J32A1 engine:
   NGK: PZFR5F-11
   DENSO: PKJ16CR-L11
   J32A2 engine:
   NGK: PZFR6E-11
   DENSO: PKJ20CR-M11

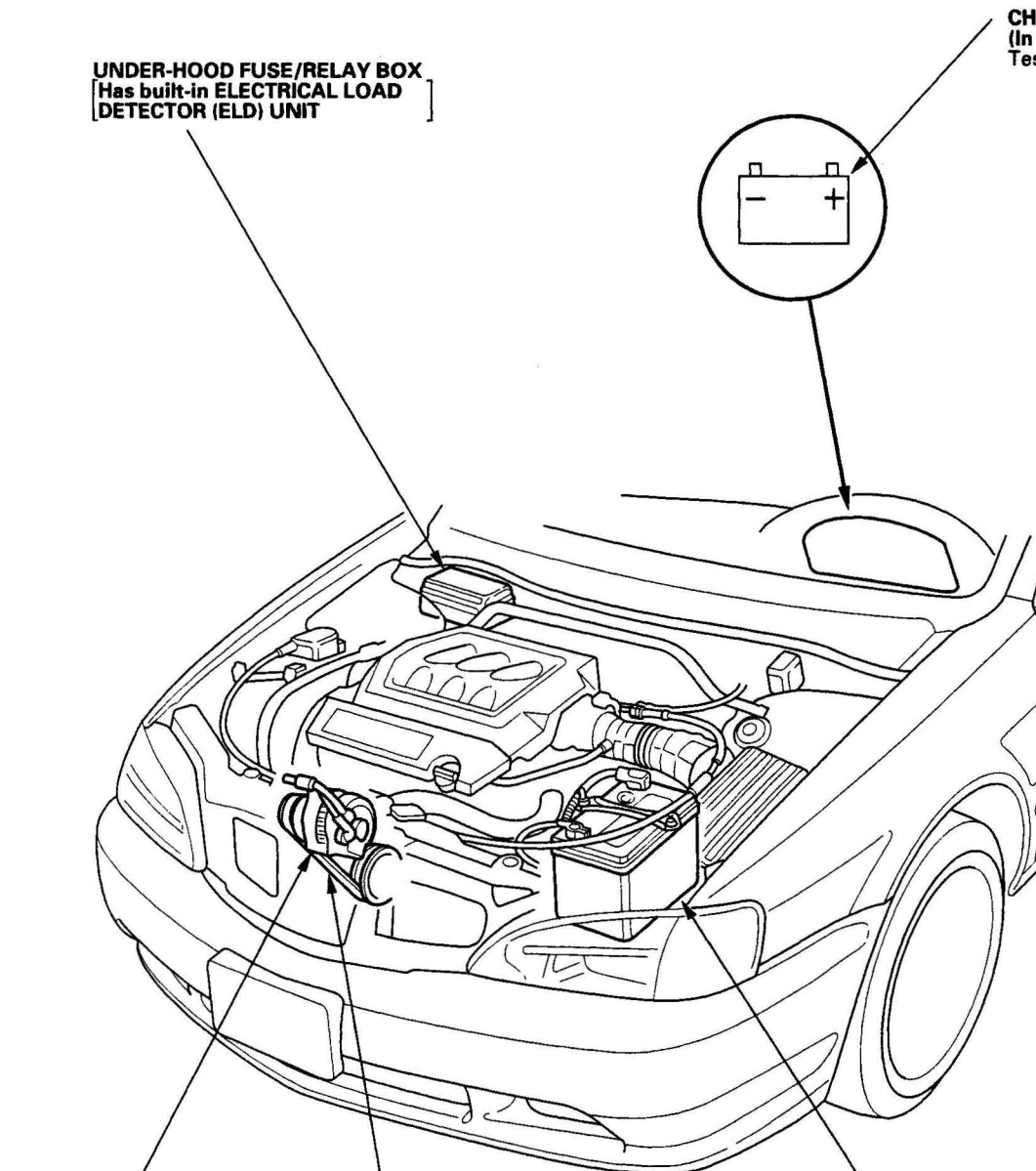


4. Apply a small quantity of anti-seize compound to the plug threads, and screw the plugs into the cylinder head finger-tight. Then torque them to 18 N·m (1.8 kgf·m, 13 lbf·ft).

BACK

Protected by AR

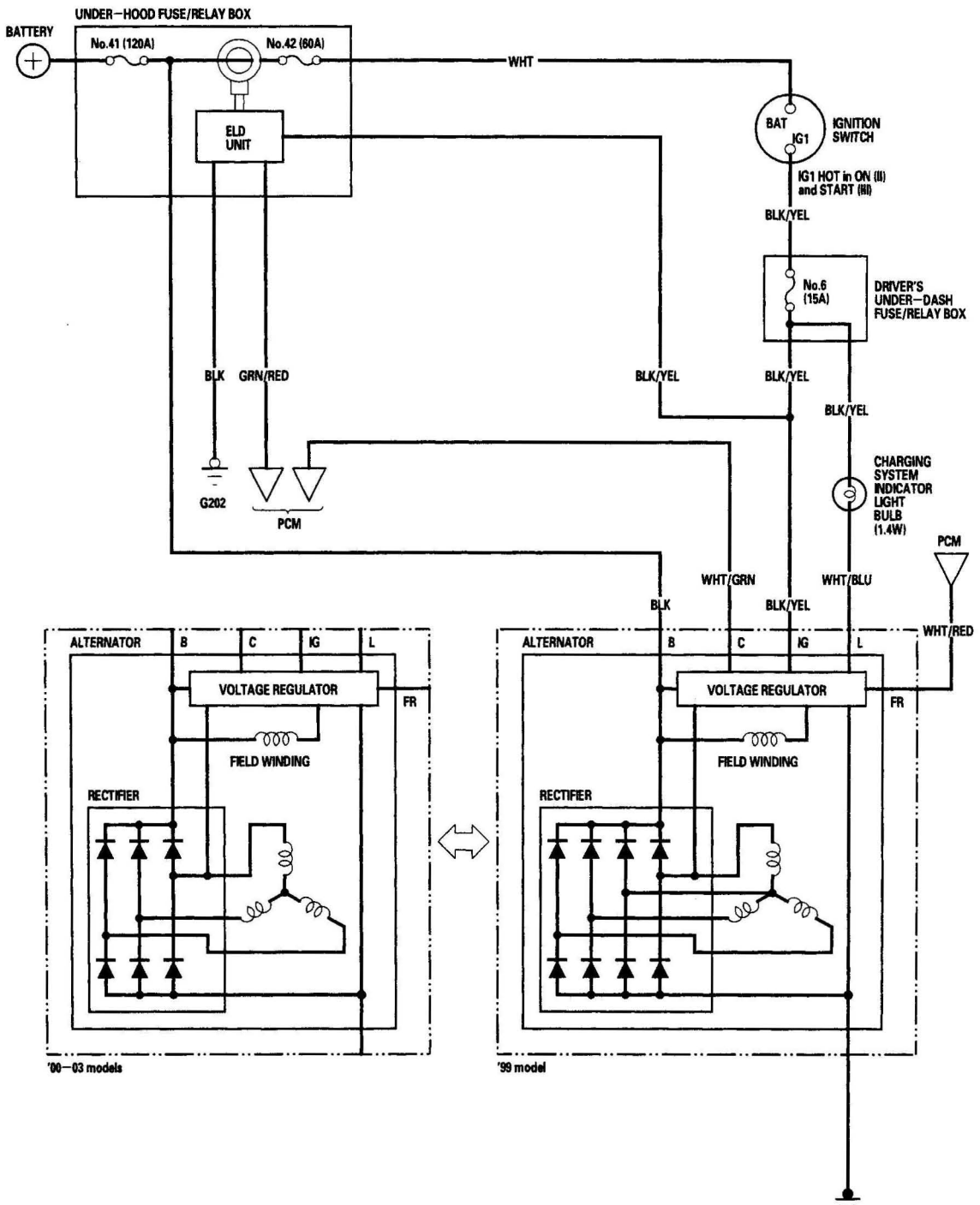
Component Location Index



BACK

Protected by AR

Circuit Diagram



BACK

Protected by AR

Charging Circuit Troubleshooting

If the charging system indicator does not come on or does not go off, or the battery is dead or low, test the following items in the order listed below:
Battery (see page 22-102)
Charging system indicator
Alternator/regulator circuit
Alternator control system

Charging System Indicator Test

1. Check the B terminal, that the 4P connector and under-hood fuse/relay box terminals are securely tightened.

   Are they securely tightened?

   YES—Go to step 2.

   NO—Tighten or reconnect. ■

2. Turn the ignition switch ON (II).

   Does the charging system indicator come on?

   YES—Go to step 3.

   NO—Go to step 7.

3. Start the engine.

   Does the charging system indicator go off?

   YES—Charging system indicator circuit is OK. ■

   NO—Go to step 4.

4. Turn the ignition switch OFF.

5. Disconnect the alternator 4P connector from the alternator.

6. Turn the ignition switch ON (II).

   Does the charging system indicator come on?

   YES—Turn the ignition switch OFF, and repair the short in the BLK/YEL and WHT/BLU wire. ■

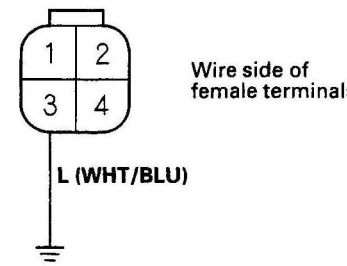
   NO—Go to step 10.

7. Turn the ignition switch OFF.

8. Disconnect the alternator 4P connector from the alternator.

9. Connect the alternator 4P connector terminal No. 3 to body ground with a jumper wire. Turn the ignition switch ON (II).

ALTERNATOR 4P CONNECTOR



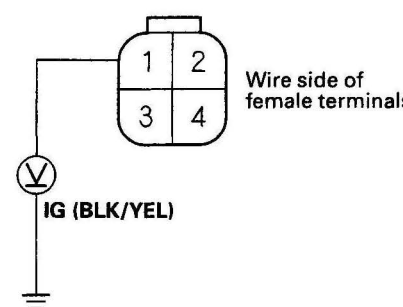
Does the charging system indicator come on?

YES—Go to step 10.

NO—Turn the ignition switch OFF. Check for a blown No. 6 (15A) fuse and a blown charging system light bulb. If the fuse and bulb are OK, repair the open in the BLK/YEL and WHT/BLU wire. ■

10. Measure the voltage at the No. 1 terminal of the alternator 4P connector with the ignition switch ON (II).

ALTERNATOR 4P CONNECTOR



Is there battery voltage?

YES—Repair or replace the alternator. ■

NO—Repair open in the BLK/YEL wire between the alternator and the driver's under-dash fuse relay box. ■

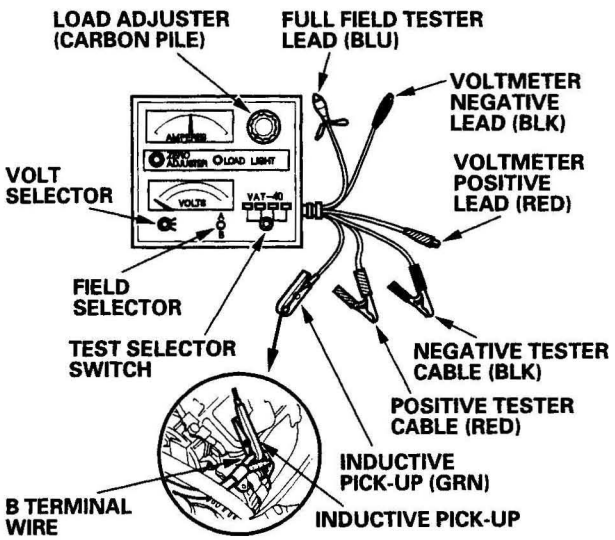
BACK

Protected by AR

Alternator and Regulator Circuit Test

1. Be sure the battery is sufficiently charged (see page 22-102).

2. Connect a VAT-40 (or equivalent tester), and turn the selector switch to position 1 (starting).



3. Shift to Park or Neutral, and start the engine. Hold the engine at 3,000 rpm, with no load until the radiator fan comes on, then let it idle.

4. Raise the engine speed to 2,000 rpm, and hold it there.

   Is there voltage over 15.1 V?

   YES—Replace the voltage regulator (see page 4-27).■

   NO—Go to step 5.

5. Release the accelerator pedal, and let the engine idle.

6. Make sure all accessories are turned off. Turn the selector switch to position 2 (charging).

7. Remove the inductive pick-up, and zero the ammeter.

8. Place the inductive pick-up over the B terminal wire of the alternator so that the arrow points away from the alternator.

9. Raise the engine speed to 2,000 rpm, and hold it there.

   Is the voltage less than 13.5 V?

   YES—Repair or replace the alternator (see page 4-27).■

   NO—Go to step 10.

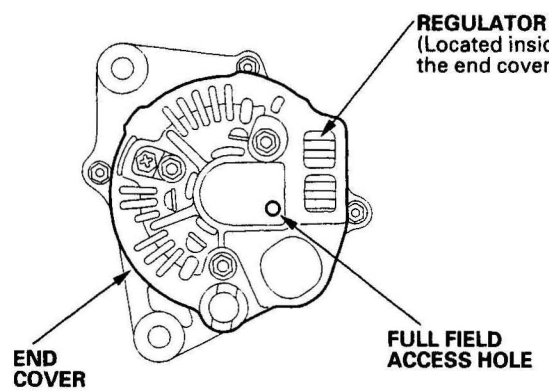
10. Apply a load with the VAT-40 until the battery voltage drops to between 12—13.5 V.

    Is the amperage 75A or more?

    YES—The charging system is OK.■

    NO—Go to step 11.

11. With the engine speed still at 2,000 rpm, full-field the alternator. Attach the probe to the VAT-40 full-field test lead, and insert the probe into the full field access hole at the back of the alternator. Switch the field selector to the "A (Ground)" position momentarily, and check the amperage reading. Because voltage will rise quickly when the alternator is full-fielded, do not allow the voltage to exceed 18 V: it may damage the electrical system.



    Is the alternator output 75A or more?

    YES—Replace the voltage regulator.■

    NO—Repair or replace the alternator (see page 4-27).■

(cont'd)

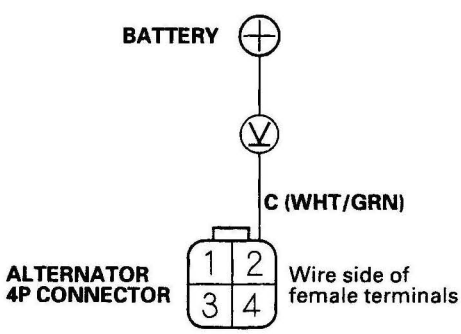
Protected by AR

Charging Circuit Troubleshooting (cont'd)

Alternator Control System Test

NOTE: After troubleshooting, perform the powertrain control module (PCM) idle learn procedure (see page 11-158).

1. Check for proper operation of the electrical load detector (ELD) by checking the malfunction indicator lamp (MIL) (see page 11-3).
2. Disconnect the alternator 4P connector from the alternator.
3. Start the engine, and turn the headlights (high beam) ON.
4. Measure voltage between the alternator 4P connector terminal No. 2 and the positive terminal of the battery.

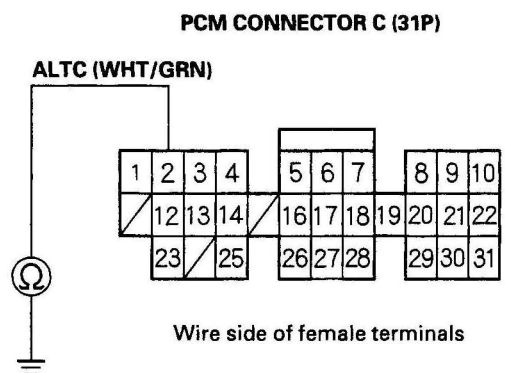


Is there 1 V or less?

YES – Go to step 8.

NO – Go to step 5.

5. Turn the headlight and ignition switch OFF.
6. Disconnect the powertrain control module (PCM) connector C (31P).
7. Check for continuity between the PCM connector terminal C2 and body ground.

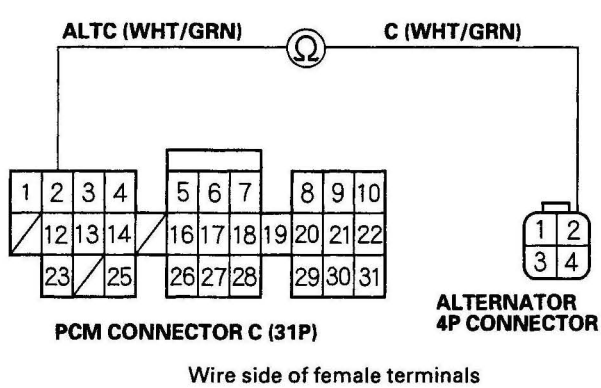


Is there continuity?

YES – Repair short in the wire between the alternator and PCM. ■

NO – Check that the terminals are firmly seated at the connector. If OK, substitute a known-good PCM, and recheck. If prescribed voltage is now available, replace the original PCM. ■

8. Turn the headlight and ignition switch OFF.
9. Disconnect the PCM connector C (31P).
10. Check for continuity between the PCM connector terminal C2 and alternator 4P connector terminal No. 2.



Is there continuity?

YES – Test the alternator/regulator. ■

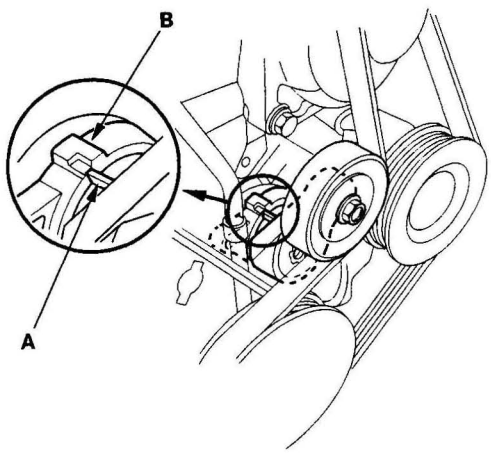
NO – Repair open in the wire between the alternator and PCM. ■

BACK

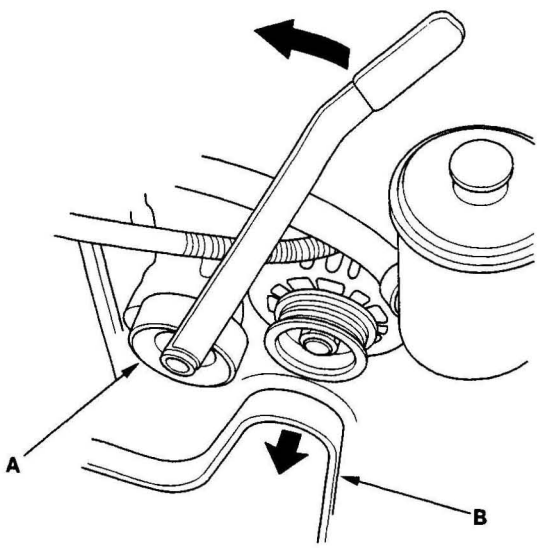
Protected by AR

Alternator-compressor Belt Inspection and Replacement

1. Inspect the belt for cracks and damaged. If the belt is cracks or damaged, replace it.
2. Check that the pointer (A) on the auto-tensioner housing is not beyond the edge of the indicator rib (B) on the tensioner base.



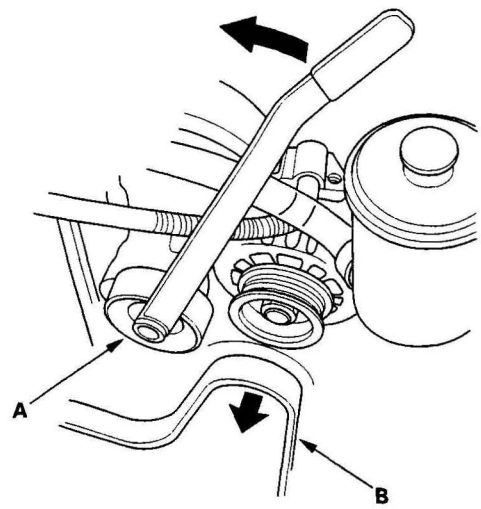
3. Move the auto-tensioner (A) to relieve tension from the alternator belt (B), and remove the alternator belt.



4. Install the new belt in the reverse order of removal.

Alternator Replacement

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable, then disconnect the positive cable.
3. Move the auto-tensioner (A) to relieve tension from the alternator belt (B), and remove the alternator belt.

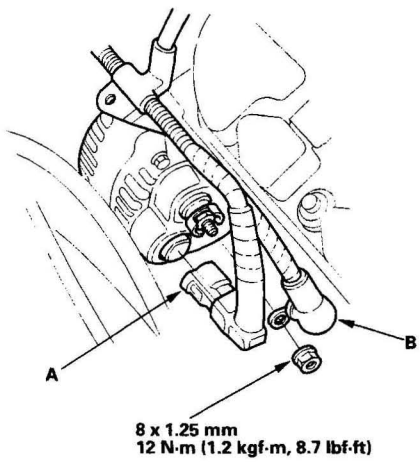


(cont'd)

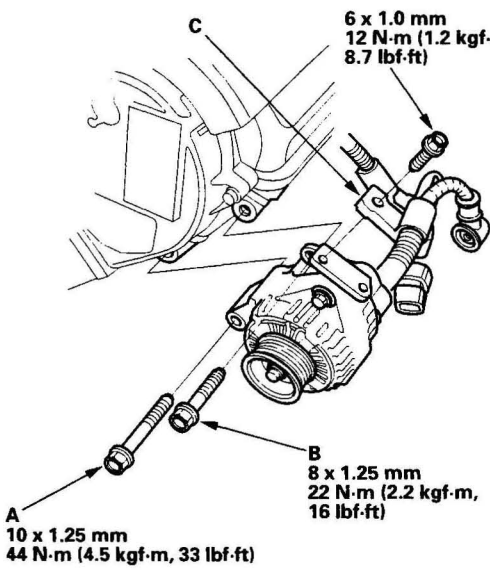
Protected by AR

Alternator Replacement (cont'd)

4. Disconnect the alternator 4P connector (A) and BLK wire (B) from the alternator.



5. Remove the mount bolt (A) and alternator bracket mounting bolt (B), then remove the harness clamp (C) from the alternator bracket.



6. Install in the reverse order of removal.

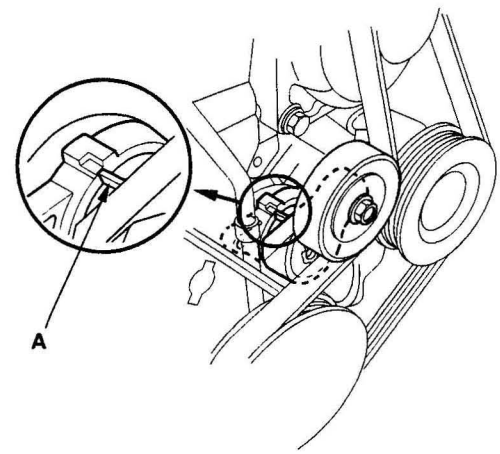
7. Enter the anti-theft codes for the radio and the navigation system, then enter the customer's radio station presets.

8. Perform the powertrain control module (PCM) idel learn procedure (see page 11-158).

9. Perform the power window control unit reset procedure ('02-03 models) (see page 22-308).

Auto-Tensioner Inspection/ Replacement

1. Check the position of the auto-tensioner indicator's pointer (A), start the engine, then check the position of the pointer again. If the position changes, go to step 5.



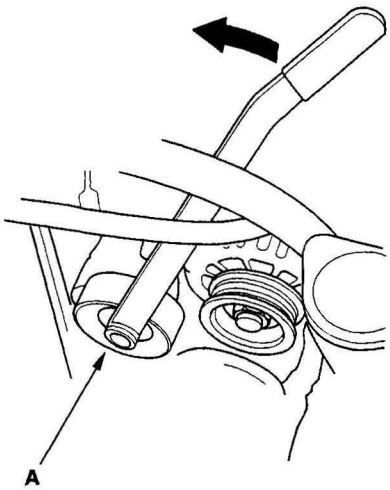
2. Check for abnormal noise from the tensioner pulley. If you hear abnormal noise, replace the tensioner pulley.

3. Stop the engine, then remove the alternator belt (see page 4-23).

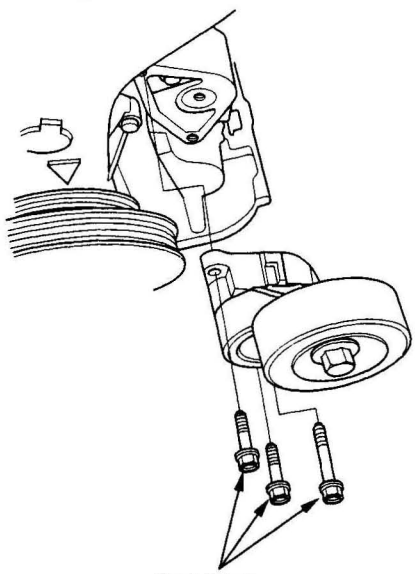
BACK

Protected by AR

4. Check if the auto-tensioner (A) moves smoothly and check for abnormal noise when the pulley is turned counterclockwise with the designated tool. If the auto-tensioner does not move smoothly or if the there is abnormal noise, replace the auto-tensioner. Do not move the auto-tensioner beyond its limit.

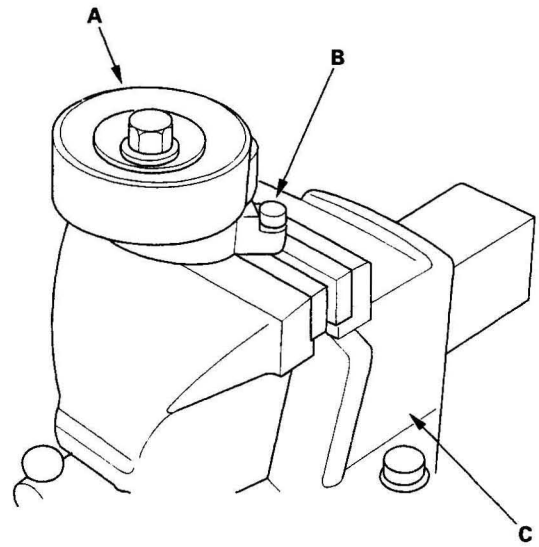


5. Stop the engine, then remove the auto-tensioner.



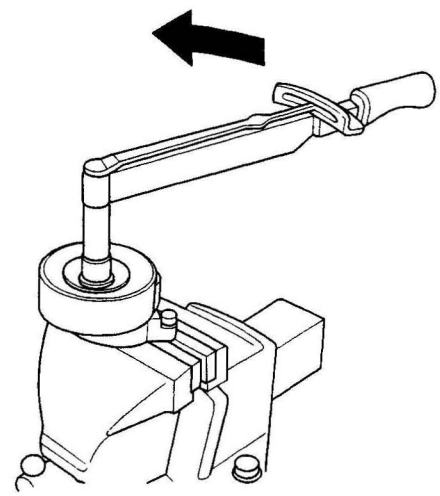
6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)

6. Clamp the auto-tensioner (A) by using two 6 mm bolts (B) and a vise (C) as shown. Do not clamp the auto-tensioner itself.



7. Attach a torque wrench to the pulley bolt. Measure the torque when the tensioner is turned counterclockwise. If the torque is less than the specified value, replace the auto-tensioner.

23 N·m (2.3 kgf·m, 17 lbf·ft)

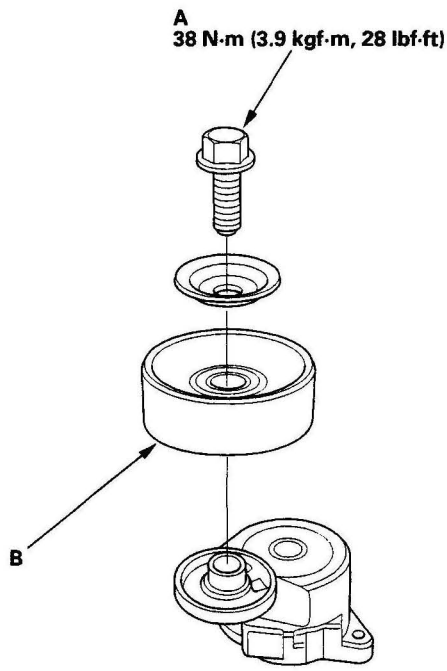


(cont'd)

Protected by AR

Auto-Tensioner Inspection/Replacement (cont'd)

8. If necessary, remove the pulley bolt (A) (left-hand threads), and replace the tensioner pulley (B).

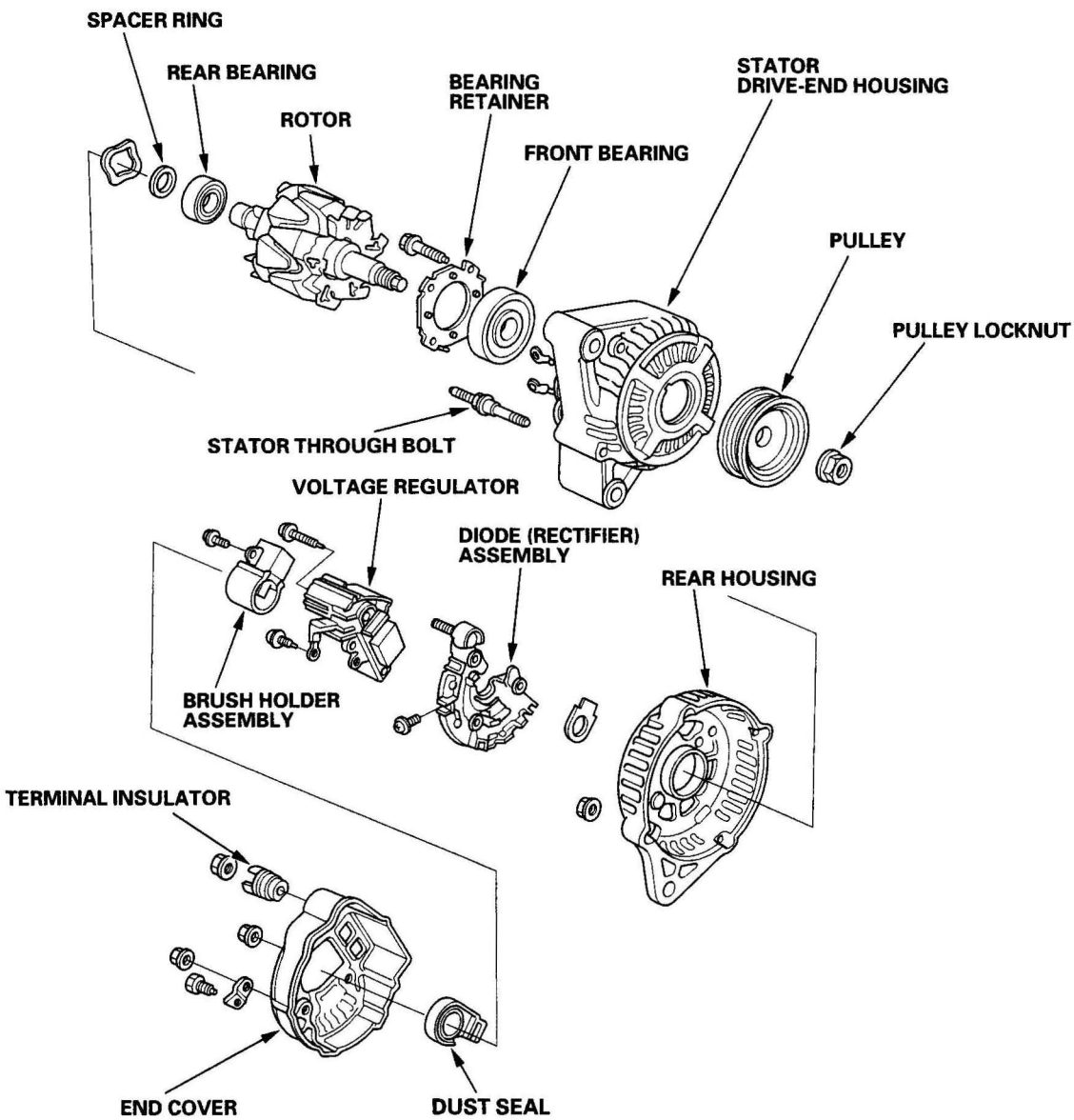


BACK

Protected by AR

Alternator Overhaul

Exploded View



(cont'd)

BACK

Protected by AR

Alternator Overhaul (cont'd)

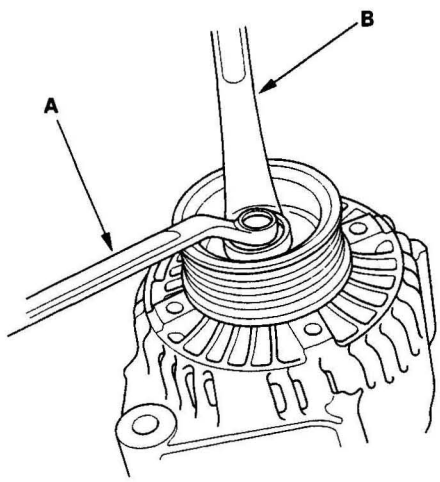
Special Tools Required
- Driver 07749-0010000
- Attachment, 52 x 55 mm 07746-0010400

NOTE: Refer to the Exploded View as needed during this procedure.

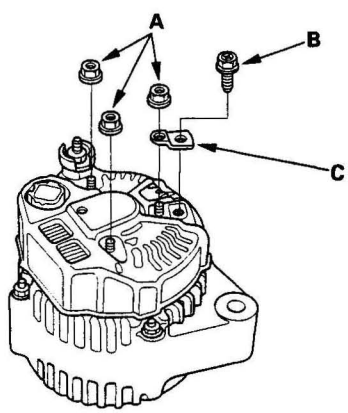
1. Test the alternator and regulator before you remove them (see page 4-20).

2. Remove the alternator (see page 4-23).

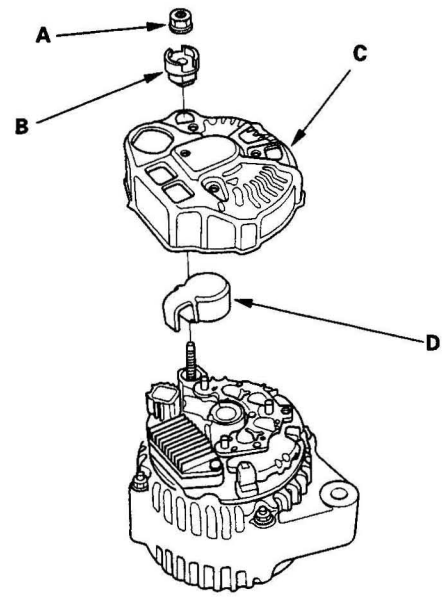
3. If the front bearing needs replacing, remove the pulley locknut with a 10 mm wrench (A) and a 22 mm wrench (B). If necessary, use an impact wrench.



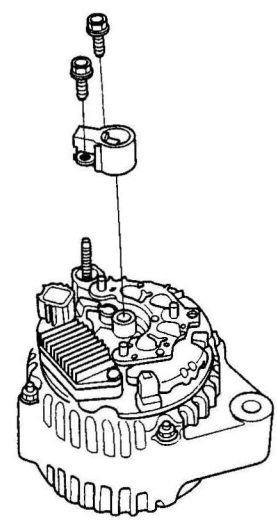
4. Remove the three flange nuts (A) and the screw (B) from the alternator, then remove the plate terminal (C).



5. Remove the washer nut (A) and insulator (B) from the "B" terminal, then remove the end cover (C) and dust seal (D).



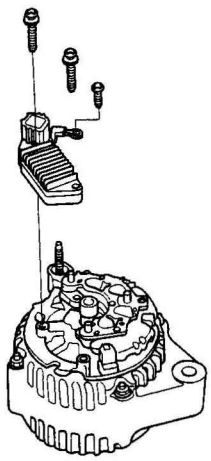
6. Remove the brush holder.



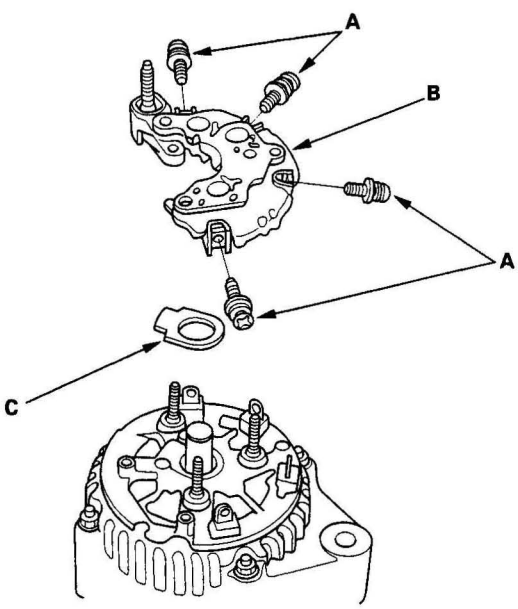
BACK

Protected by AR

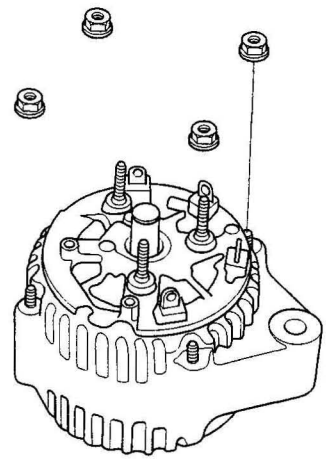
7. Remove the voltage regulator.



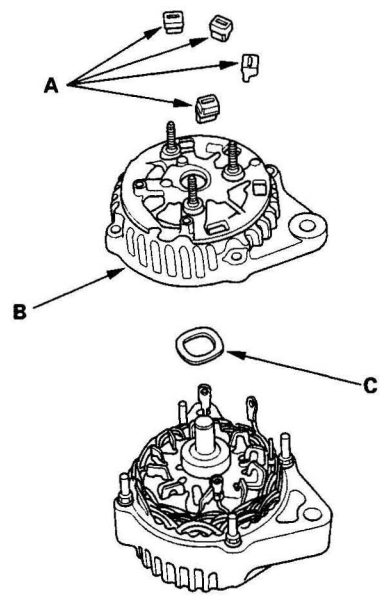
8. Remove the four screws (A), then remove the rectifier (B) and rubber seal (C).



9. Remove the four flange nuts.



10. Remove the four insulators (A) rear housing (B) and washer (C).

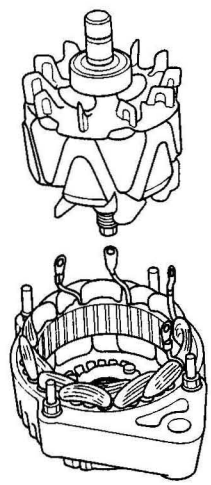


(cont'd)

Protected by AR

Alternator Overhaul (cont'd)

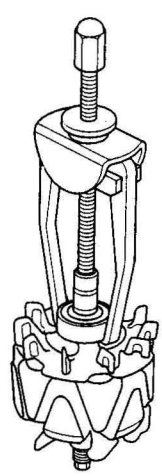
11. If you are not replacing the front bearing and/or rear bearing, go to step 18. Remove the rotor from the stator drive end housing.



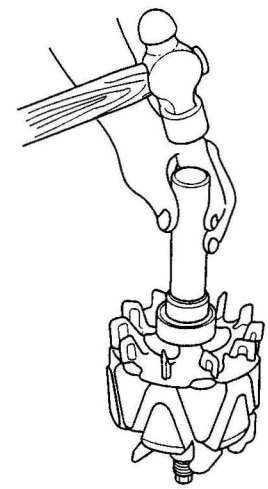
12. Inspect the rotor shaft for scoring, and inspect the bearing journal surface in the stator housing for seizure marks.

    - If either the rotor or stator housing is damaged, replace the alternator.
    - If both the rotor and the stator housing are OK, go to step 13.

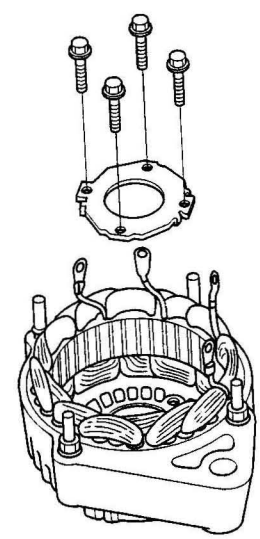
13. Remove the rear bearing using a puller as shown.



14. With a hammer and commercially available tools shown, install a new rear bearing in the rotor shaft.



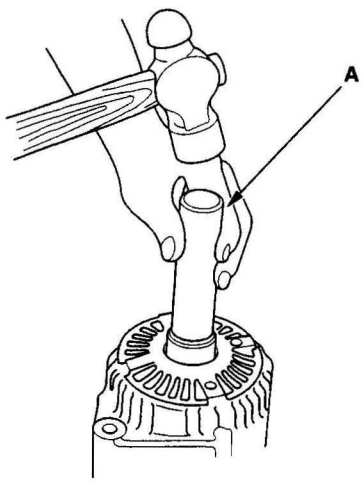
15. Remove the front bearing retainer plate.



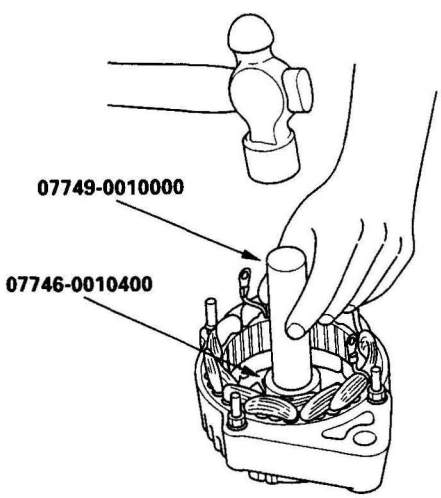
BACK

Protected by AR

16. Support the stator housing in a vise, and drive out the front bearing with a brass drift (A) and hammer.



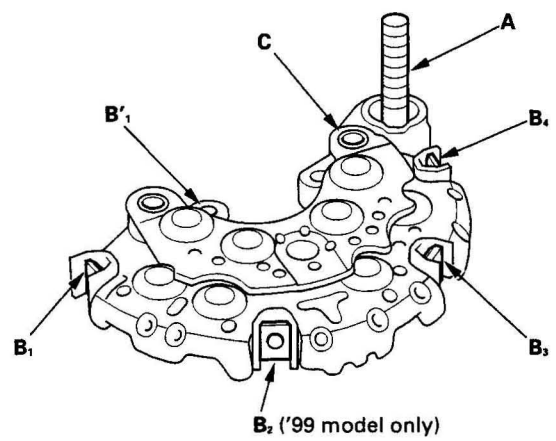
17. With a hammer and the special tools, install a new front bearing in the stator housing.

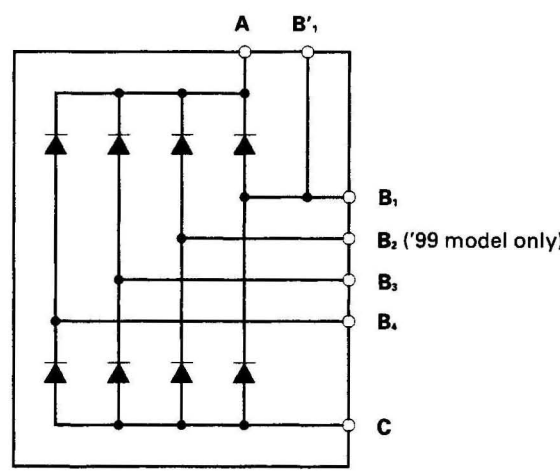


Rectifier Test

18. Check for continuity in each direction, between the B terminal (A) and P terminals (B), and between the E terminal (C) and P terminals of each diode pair. All diodes should have continuity in only one direction. Because the rectifier diodes are designed to allow current to pass in only one direction, and the rectifier is made up of eight diodes (four pairs) (six diodes (three pairs) for '00-03 models), you must test each diode in both directions for continuity with an ohmmeter that has diode checking capability: a total of 16 checks (12 checks for '00-03 models).

- If any diode is faulty, replace the rectifier assembly. (Diodes are not available separately.)
- If all the diodes are OK, go to step 19.





(cont'd)

BACK

Protected by AR

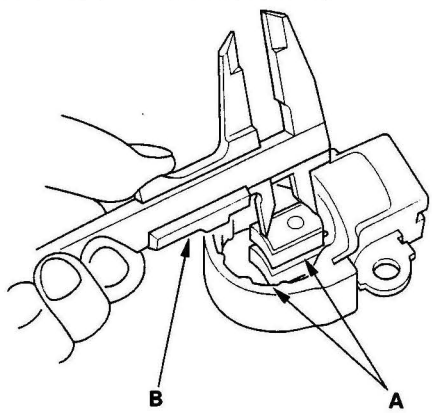
Alternator Overhaul (cont'd)

Alternator Brush Inspection

19. Measure the length of both brushes (A) with a vernier caliper (B).

    - If either brush is shorter than the service limit, replace the brush assembly.
    - If brush length is OK, go to step 20.

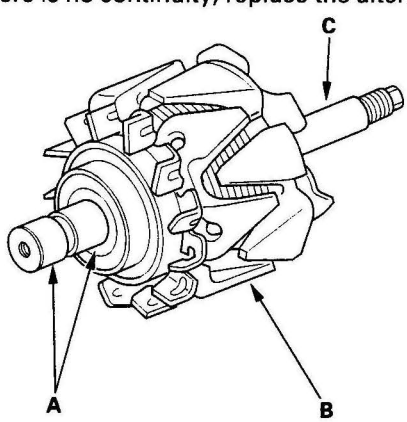
Alternator Brush Length:
Standard (New): 10.5 mm (0.41 in.)
Service Limit: 1.5 mm (0.06 in.)



Rotor Slip Ring test

20. Check that there is continuity between the slip rings (A).

    - If there is continuity, go to step 21.
    - If there is no continuity, replace the alternator.



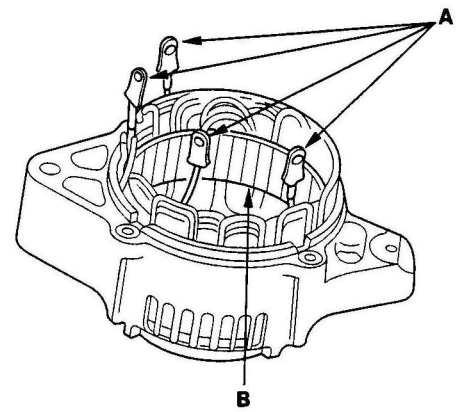
21. Check that there is no continuity between each slip ring and the rotor (B) and the rotor shaft (C).

    - If there is no continuity, go to step 22.
    - If there is continuity, replace the alternator.

Stator Test

22. Check that there is continuity between each pair of leads (A).

    - If there is continuity, go to step 23.
    - If there is no continuity, replace the alternator.



23. Check for no continuity between each lead and the coil core (B).

    - If there is no continuity, go to step 24.
    - If there is continuity, replace the alternator.

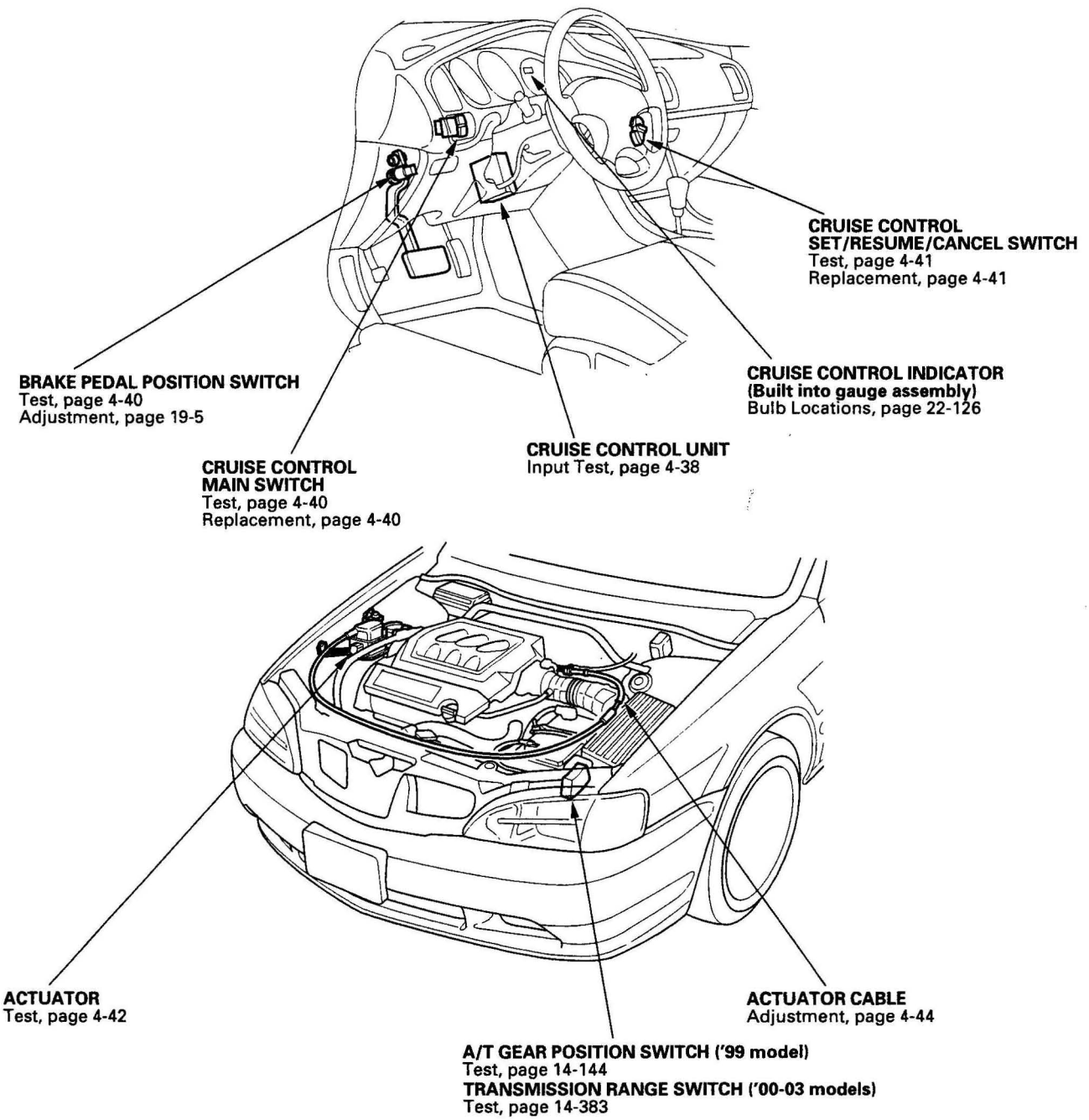
24. Assemble the alternator in the the reverse order of disassembly, and note these items:

    - Be careful not to get any grease or oil on the slip rings.
    - If you removed the pulley, tighten its locknut to 111 N·m (11.3 kgf·m, 81.7 lbf·ft) when you reinstall it.

BACK

Protected by AR

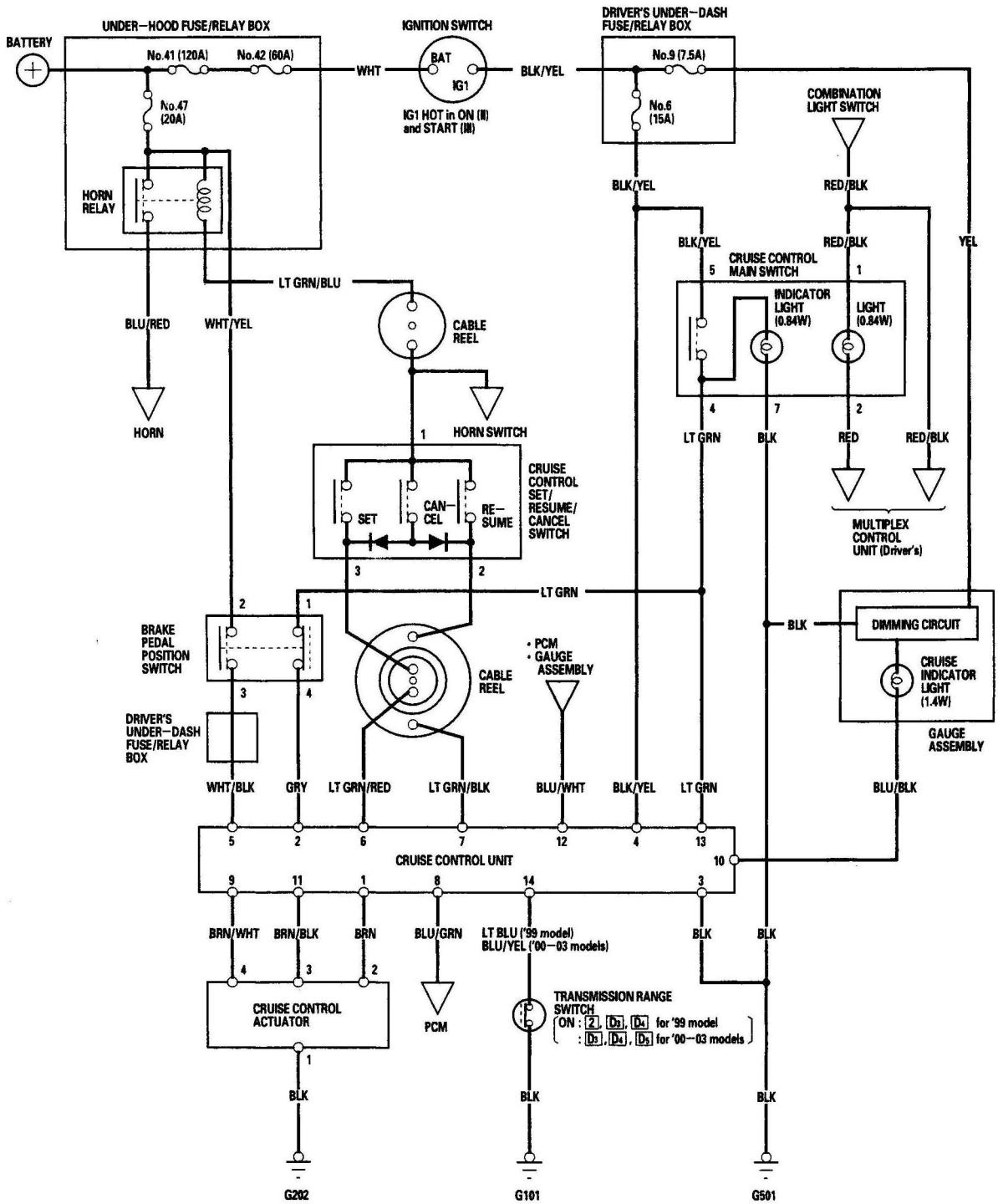
Component Location Index



BACK

Protected by AR

Circuit Diagram



BACK

Protected by AR

Symptom Troubleshooting Index

NOTE:
- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting,
  - check that the speedometer works properly.
  - check the No. 9 (7.5A) and No. 6 (15A) fuses in the driver's under-dash fuse/relay box, and No. 47 (20A) fuse in the under-hood fuse/relay box.
  - check that the horn sounds.
  - check the tachometer to see if it works properly.

Symptom	Diagnostic procedure	Also check for
Cruise control cannot be set	1. Check main switch (see page 4-40) 2. Check SET/RESUME/CANCEL switch (see page 4-41) 3. Test brake pedal position switch (see page 4-40) and check its adjustment (see page 19-5) 4. '99 model: Check A/T gear position switch (see page 14-144) '00-03 models: Check transmission range switch (see page 14-383) 5. Check control unit (see page 4-38)	• Poor ground: G101 • Open circuit, loose or disconnected terminals: BLK/YEL, LT GRN, LT GRN/RED, GRY, LT BLU (BLU/YEL for '00-03 models), BLU/WHT
Cruise control can be set, but indicator light does not go on	1. Check dimming circuit in gauge (see page 22-110) 2. Check control unit (see page 4-38)	• Poor ground: G501 • Open circuit, loose or disconnected terminals: YEL, BLU/BLK
Cruise speed is noticeably higher or lower than what was set	1. Check actuator and cable deflection (see page 4-42) 2. Check control unit (see page 4-38)	
Excessive overshooting or undershooting when trying to set speed	1. Check actuator and cable deflection (see page 4-42) 2. Check control unit (see page 4-38)	
Speed fluctuates on a flat road with cruise control set	1. Check actuator and cable deflection (see page 4-42) 2. Check control unit (see page 4-38)	
Vehicle does not decelerate or accelerate accordingly when SET/RESUME/CANCEL button is pushed	1. Check SET/RESUME/CANCEL switch (see page 4-41) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals: LT GRN/RED, LT GRN/BLK
Set speed not cancelled (engine rpm stays high) when shift lever is moved to Neutral position	1. '99 model: Check A/T gear position switch (see page 14-144) '00-03 models: Check transmission range switch (see page 14-383) 2. Check control unit (see page 4-38)	Short to ground in the LT BLU wire (BLU /YEL wire for '00-03 models)
Set speed not cancelled when brake pedal is pushed	1. Test brake pedal position switch (see page 4-40)and check its adjustmet (see page 19-5) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals: WHT/BLK

(cont'd)

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Diagnostic procedure	Also check for
Set speed does not cancel when main switch is pushed OFF	1. Check main switch (see page 4-40) 2. Check control unit (see page 4-38)	Short to power in the LT GRN wire
Set speed does not cancel when CANCEL button is pushed	1. Check SET/RESUME/CANCEL switch (see page 4-41) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals: LT GRN/RED, LT GRN/BLK
Set speed will not resume when RESUME button is pushed (with main switch on, set speed is temporarily cancelled)	1. Check SET/RESUME/CANCEL switch (see page 4-41) 2. Check control unit (see page 4-38)	Open circuit, loose or disconnected terminals: LT GRN/BLK
The transmission shifts down slower than normal when going up a hill with the cruise control on	1. Troubleshoot the cruise control communication circuit (see page 4-37)	Open circuit, loose or disconnected terminals: BLU/GRN

BACK

Protected by AR

Cruise Control Communication Circuit Troubleshooting

NOTE: After troubleshooting, perform the powertrain control module (PCM) idle learn procedure (see page 11-158).

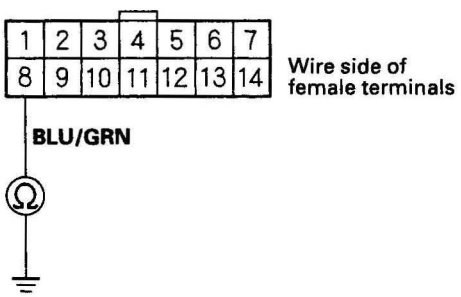
1. Start the engine.
2. Turn on the cruise control main switch, then drive the vehicle to speeds over 25 mph (40 km/h) with the cruise control.

   Does the cruise control operate?

   YES – Go to step 3.

   NO – Check the cruise control unit or cruise control actuator. ■
3. Turn the ignition switch OFF.
4. Disconnect cruise control unit 14P connector and powertrain control module (PCM) connector A (32P).
5. Check for continuity between the No. 8 terminal of the cruise control unit 14P connector and body ground.

CRUISE CONTROL UNIT 14P CONNECTOR



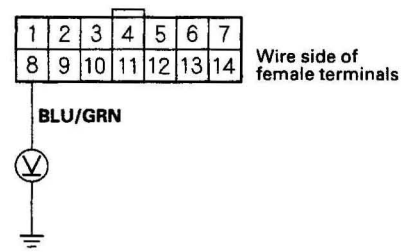
Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal A5 and the cruise control unit 14P connector terminal No. 8. ■

NO – Go to step 6.

6. Reconnect the cruise control unit 14P connector and PCM connector A (32P).
7. Connect a voltmeter between the No. 8 terminal of the cruise control unit 14P connector and body ground. Test-drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control set, and watch the voltmeter.

CRUISE CONTROL UNIT 14P CONNECTOR



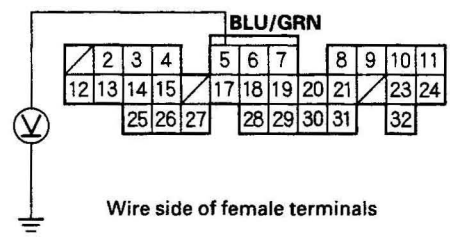
Is there about 1 V?

YES – Go to step 8.

NO – Substitute a known-good cruise control unt. If the system works properly, replace the cruise control unit. ■

8. Connect a voltmeter between PCM connector terminal A5 and body ground. Drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control set, and watch the voltmeter.

PCM CONNECTOR A (32P)



Is there about 1 V?

YES – Check for loose connectors of the BLU/GRN wire between the cruise control unit and PCM. If necessary replace the PCM and recheck (see page 11-4). ■

NO – Repair open in the wire between the PCM connector terminal A5 and the cruise control unit 14P connector terminal No. 8. ■

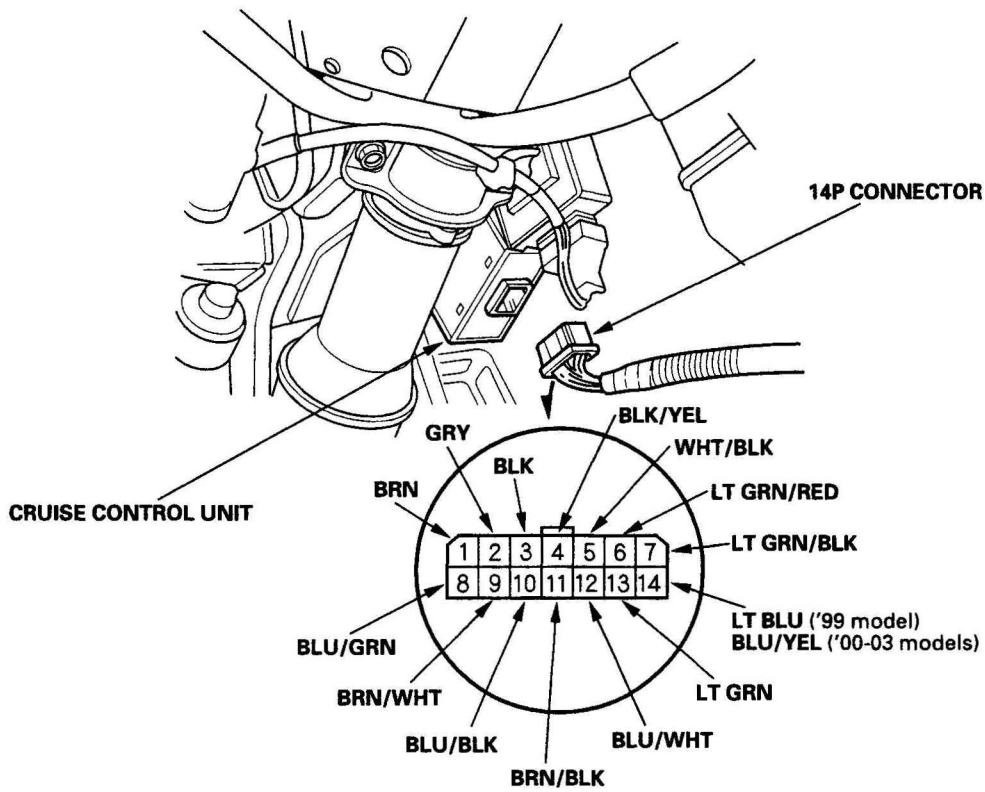
BACK

Protected by AR

Control Unit Input Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS before performing repairs or service (see page 23-17).

1. Remove the driver's dashboard lower cover.
2. Disconnect the 14P connector from the control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.



4. With the 14P connector disconnected, make these input tests.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BRN	Connect battery power	Check the operation of the magnetic clutch: Clutch should click and output link should be locked.	• Faulty actuator • Poor ground (G202) • An open in the wire • Short to ground
2	GRY	Ignition switch ON (II), main switch ON and brake pedal depressed, then released	Check for voltage to ground: There should be 0 V with the pedal depressed and battery voltage with the pedal released.	• Faulty brake pedal position switch • An open in the wire • Open in main switch • Blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box
3	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire

BACK

Protected by AR

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
4	BLK/YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box • An open in the wire
5	WHT/BLK	Brake pedal depressed, then released	Check for voltage to ground: There should be battery voltage with the pedal depressed, and 0 V with the pedal released.	• Blown No. 47 (20A) fuse in the under-hood fuse/relay box • Faulty brake pedal position switch • An open in the wire
6	LT GRN/RED	Set button pushed	Check for voltage to ground: There should be battery voltage. When testing terminal No. 6, there should be no voltage on terminal No. 7.	• Blown No. 47 (20A) fuse in the under-hood fuse/relay box • Faulty horn relay • Faulty set/resume/cancel switch • Faulty cable reel • An open in the wire
7	LT GRN/BLK	Resume button pushed	Check for voltage to ground: There should be battery voltage. When testing terminal No. 7, there should be no voltage on terminal No. 6.	
8	BLU/GRN	Reconnect the cruise control unit 14P connector, start the engine, turn the main switch ON and drive the vehicle to speeds over 25 mph (40 km/h) with the cruise control set.	Check for voltage to ground: There should be about 1V	• Loose connection at the PCM • Fauty cruise control unit • Short to ground
9 11	BRN/WHT BRN/BLK	Connect battery power to the BRN/WHT terminal and ground to the BRN/BLK terminal	Check the opration of the actuator motor: You should be able to hear the motor	• Fauty actuator • An open in the wire
10	BLU/BLK	Ignition switch ON (II)	Attach to ground: Cruise indicator light in the gauge assembly should comes on.	• Blown bulb • Blown No. 9 (7.5A) fuse in the under-dash driver's fuse/relay box • Faulty dimming circuit in the gauge assembly • An open in the wire
12	BLU/WHT	Ignition switch ON (II) and main switch ON; raise the front of the vehicle, and rotate one wheel slowly while holding the other wheel	Check for voltage between the BLU/WHT (+) and BLK (−) terminals: There should be 0−5 V or more repeatedly.	• Faulty PCM • An open in the wire • Short to ground
13	LT GRN	Ignition switch ON (II) and main switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box • Faulty main switch • An open in the wire
14	LT BLU (BLU/YEL '00-03 models)	Shift lever in 2, D3 or D4 (D5, D4 or D5 for '00-03 models)	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity when shift lever is in other positions.	• Faulty transmission range switch • Poor ground (G101) • An open in the wire

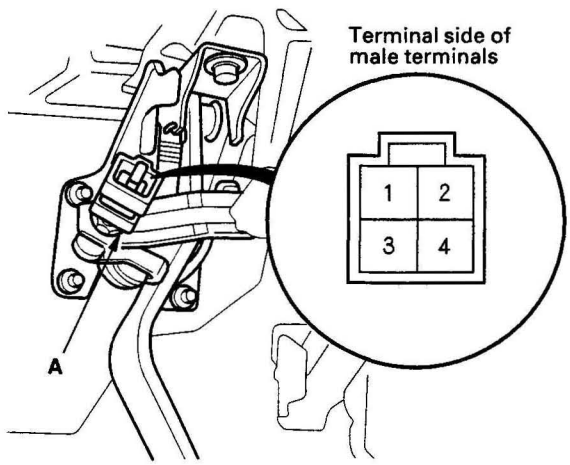
5. If any test indicates a problem, find and correct the cause, then recheck the system. If all the input tests prove OK, the control unit must be faulty. Substitute a known-good control unit and retest. If the system works properly, replace the control unit.

BACK

Protected by AR

Brake Pedal Position Switch Test

1. Disconnect the 4P connector from the switch (A).

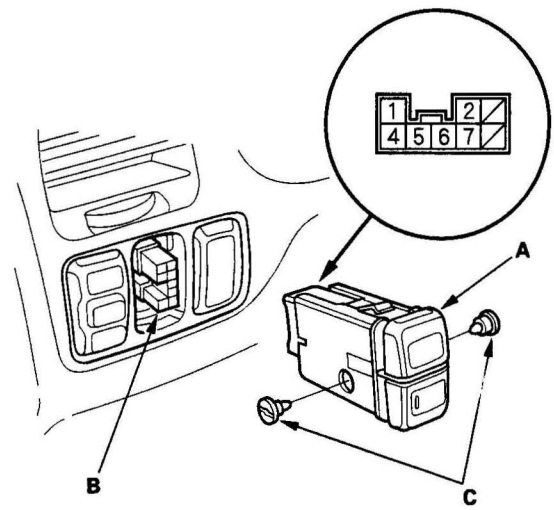


2. Remove the brake pedal position switch.
3. Check for continuity between the terminals according to the table.
   - If the continuity is not as specified, replace the brake pedal position switch and adjust the pedal height (see page 19-5).
   - If OK, install the brake pedal position switch and adjust the pedal height (see page 19-5).

Terminal / Brake Switch	1	2	3	4
DEPRESSED		○—○		
RELEASED	○————			————○

Main Switch Test/Replacement

1. Carefully pry the switch (A) out of the instrument panel.



2. Disconnect the 8P connector (B) from the switch.
3. Check for continuity between the terminals in each switch position according to the table. If there is no continuity, replace the bulbs (C) or the switch.

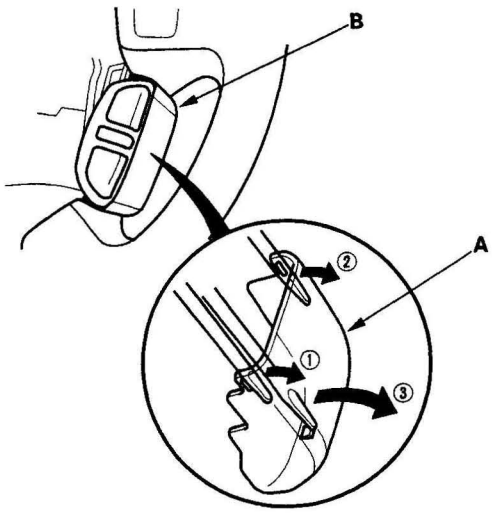
Terminal / Position	4		7	5	1		2
OFF	○	⊗	○		○	⊗	○
ON	○	⊗	○	○	○	⊗	○

BACK

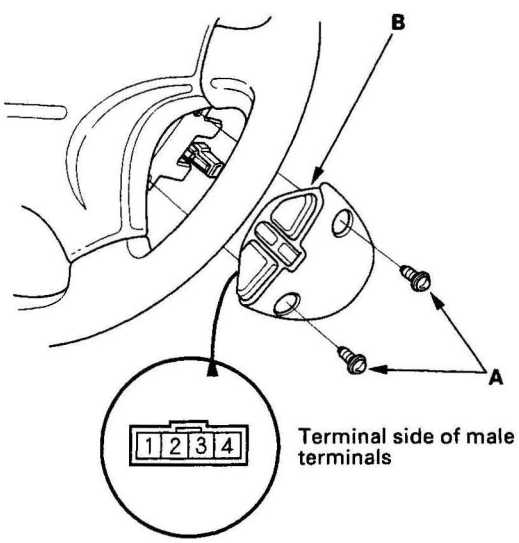
Protected by AR

Set/Resume/Cancel Switch Test/Replacement

1. Carefully remove the set/resume/cancel switch cover (A) by prying between the cover and the switch (B) in the sequence shown.



2. Remove the two screws (A), then remove the switch (B).



3. Check for continuity between the terminals in each switch position according to the table.

   - If there is continuity and it matches the table, but switch failure occurred on the cruise control unit input test, check and repair the wire hamess on the switch circuit.
   - If there is no continuity in one or both positions, replace the switch.

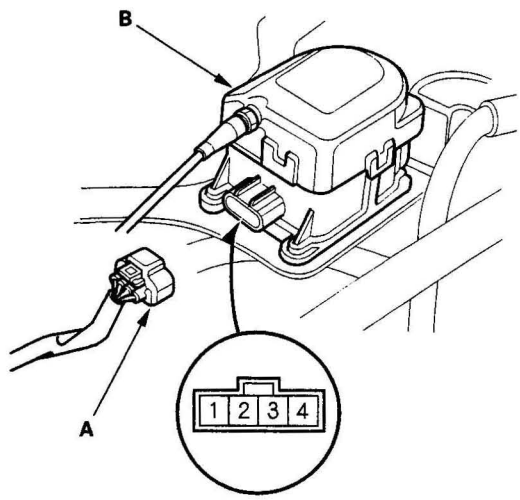
Terminal / Position	1		2	3
SET (ON)	○	———	○	○
RESUME (ON)	○	———	○	
CANCEL (ON)	○	▸ ▸	○	○

BACK

Protected by AR

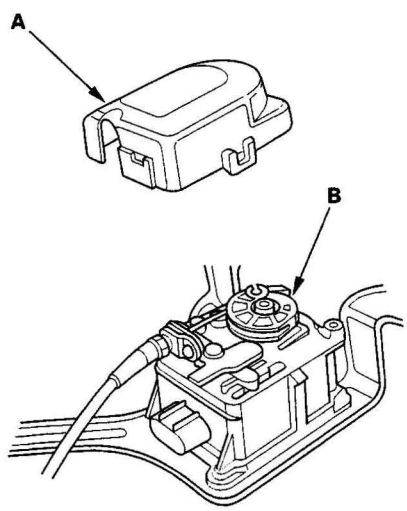
Actuator Test

1. Disconnect the 4P connector (A) from the actuator (B).



Terminal side of male terminals

2. Remove the cover (A), and check the output linkage (B) for smooth movement.



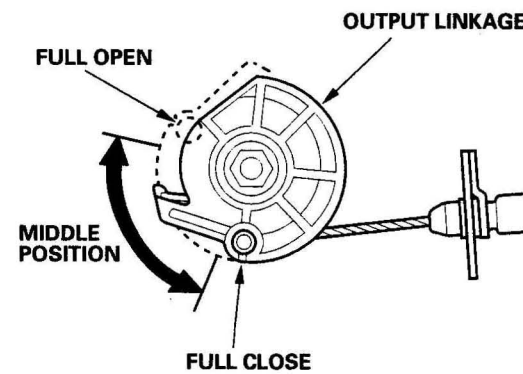
3. Connect the battery power to the No. 2 terminal and ground to the No. 1 terminal.

4. Check for a clicking sound from the magnetic clutch. The output linkage should be locked.

5. If the output linkage is not locked, replace the actuator assembly.

6. Check the operation of the actuator motor in each output linkage position according to the table. You should be able to hear the motor.

Battery power polarities		Output linkage position		
(+)	(−)	FULL CLOSE	MIDDLE POSITION	FULL OPEN
No. 4 Terminal	No. 3 Terminal	The motor runs.	The motor runs.	The motor stops.
No. 3 Terminal	No. 4 Terminal	The motor stops.	The motor runs.	The motor runs.



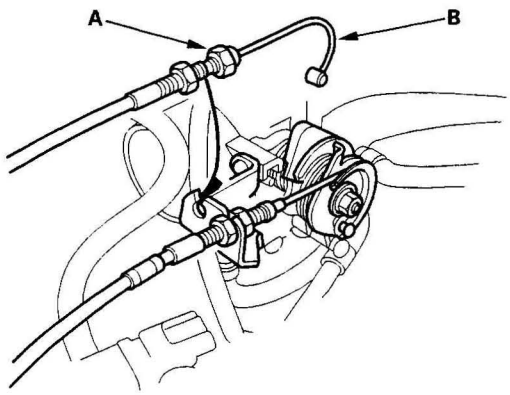
7. If the actuator motor does not operate as specified, replace the actuator assembly.

BACK

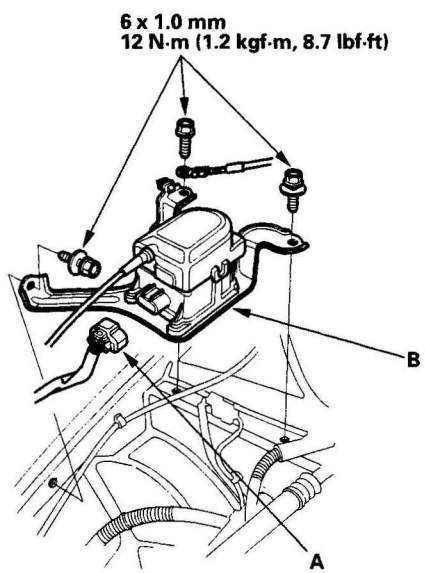
Protected by AR

Actuator/Cable Replacement

1. Loosen the locknut (A), then disconnect the actuator cable (B) from the throttle linkage.

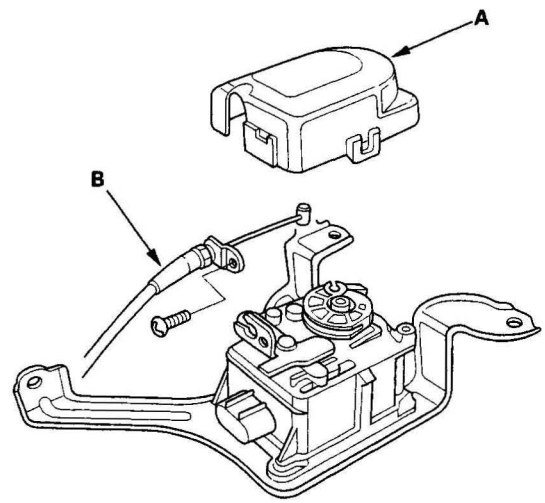


2. Disconnect the 4P connector (A) from the actuator.

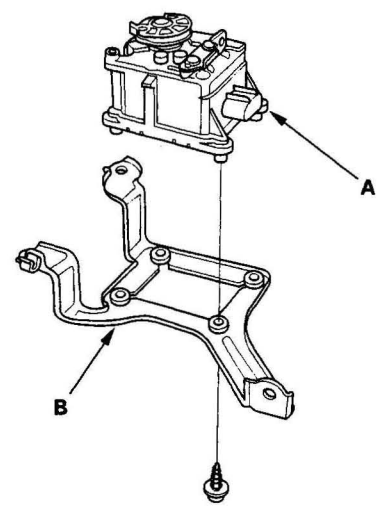


3. Remove the three mounting bolts, and remove the actuator assembly (B).

4. Remove the actuator cover (A), then remove the actuator cable (B) from the actuator.



5. Remove the actuator (A) from the bracket (B).

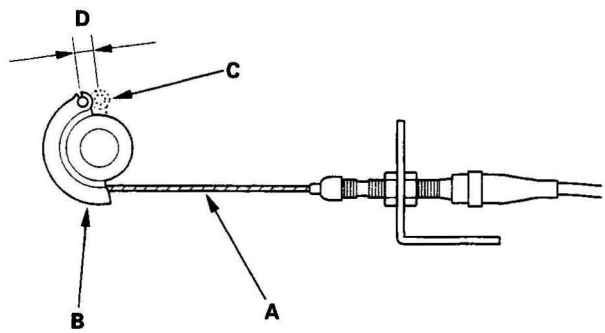


6. Install in the reverse order of removal, and adjust the free play at the throttle linkage after connecting the actuator cable.

Protected by AR

Actuator Cable Adjustment

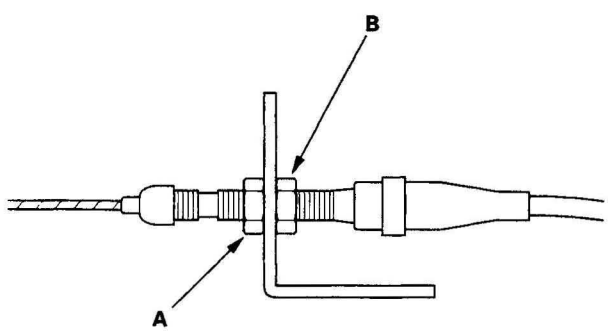
1. Check that the actuator cable (A) moves smoothly with no binding or sticking.



2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or Neutral) until the radiator fan comes on, then let it idle.

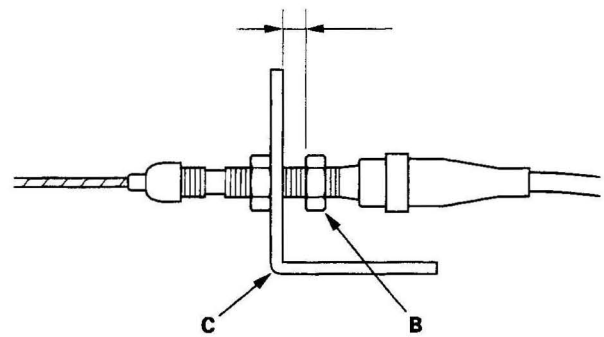
3. Measure the amount of movement of the output linkage (B) until the engine speed starts to increase. At first, the output linkage should be located at the fully closed position (C). The free play (D) should be 3.75±0.5 mm (0.15±0.02 in.).

4. If the free play is not within specs, move the cable to the point where the engine speed starts to increase, then tighten the locknut (A) and adjusting nut (B).

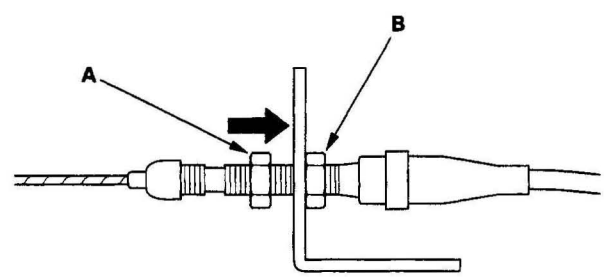


5. Turn the adjusting nut (A) until it is 3.75±0.5 mm (0.15±0.02 in.) away from the bracket (B).

3.75±0.5 mm (0.15±0.02 in.)



6. Pull the cable so that the adjusting nut (A) touches the bracket, then tighten the locknut (B).

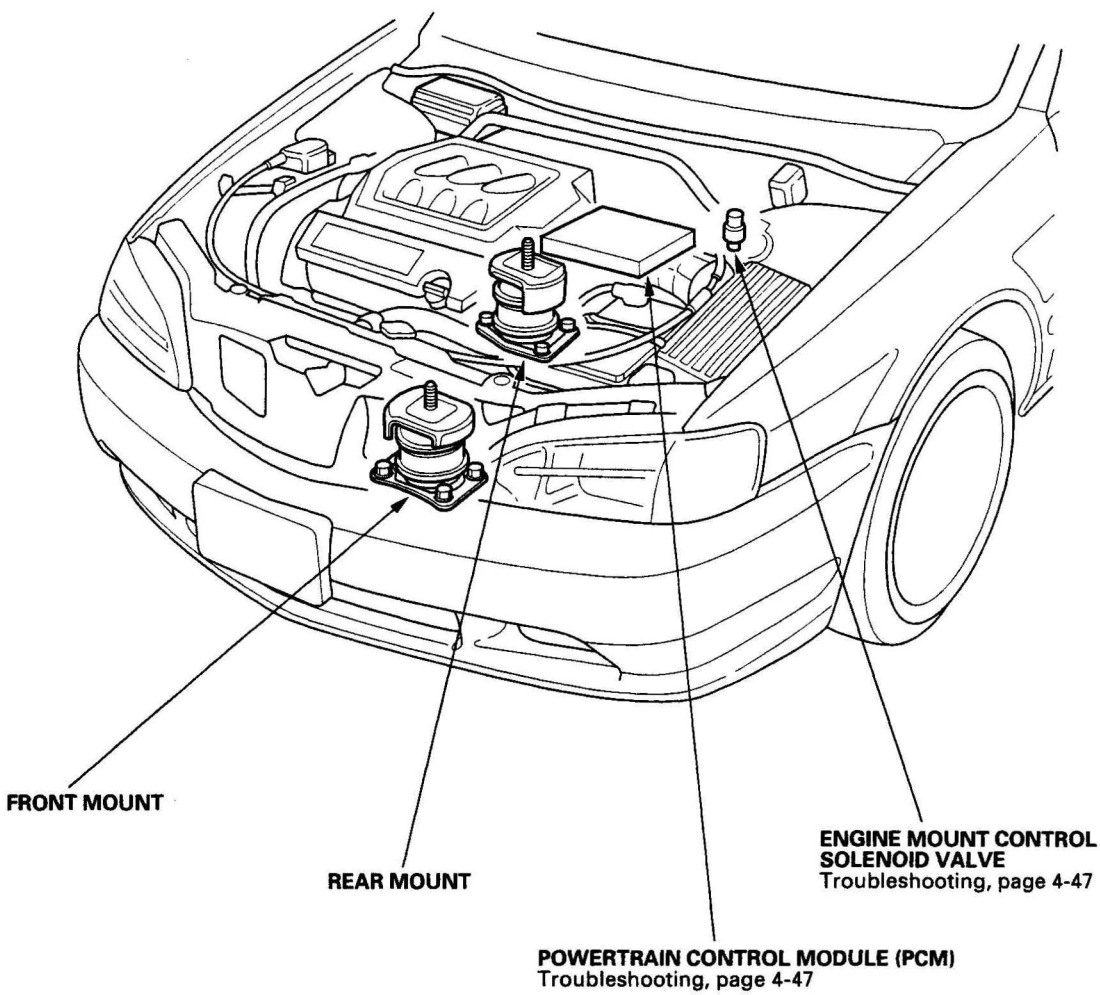


BACK

Protected by AR

Engine Mount Control System

Component Location Index

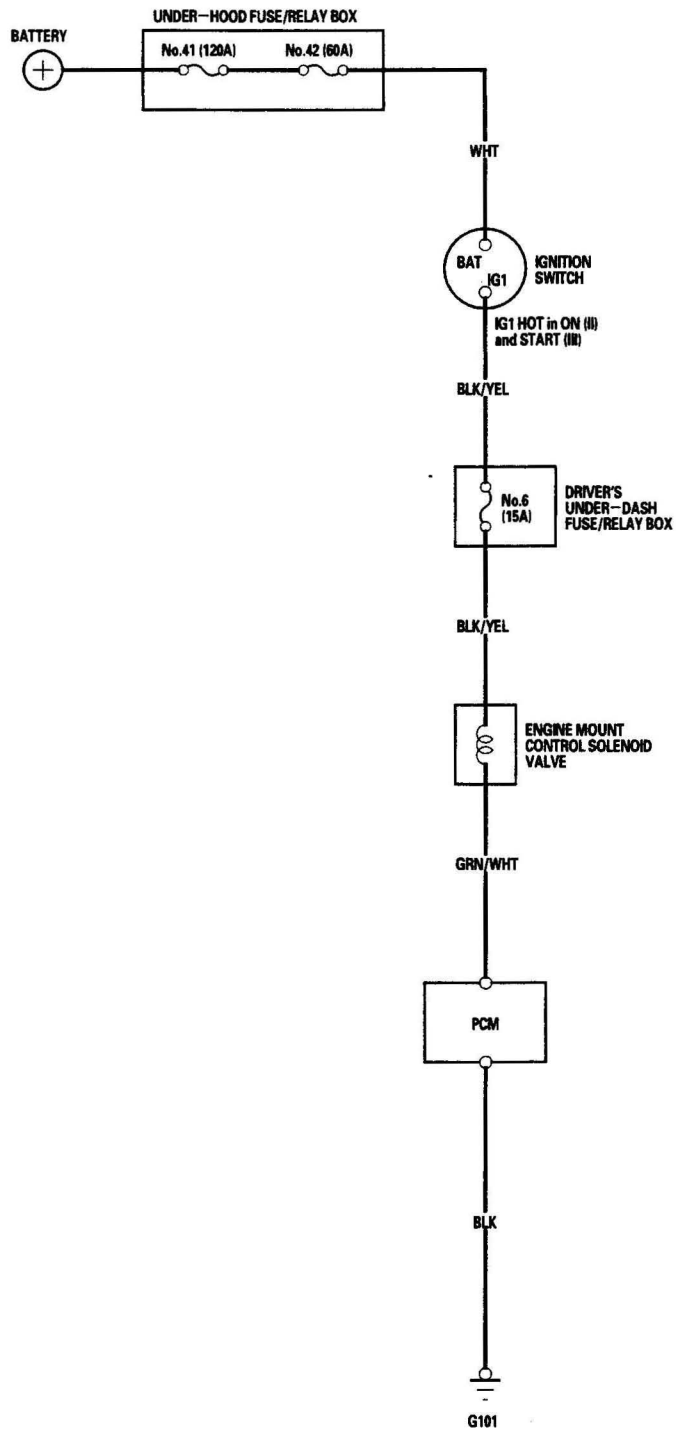


BACK

Protected by AR

Engine Mount Control System

Circuit Diagram



BACK

Protected by AR

Troubleshooting

Special Tool Required
Vacuum pump/gauge, 0–30 in.Hg
A973X-041-XXXXX

NOTE: Check the vacuum hoses and lines for damage and proper connections before troubleshooting.

Follow this procedure if the engine vibrates excessively when idling.

1. Warm up the engine to normal operating temperature (the cooling fan comes on twice).

   Is the idle speed less than 680 rpm (750 rpm for '02-03 models)?

   YES – Go to step 2.

   NO – Adjust the idle speed (see page 11-157). ■

2. Fully depress the brake pedal.

3. With the transmission in gear, have an assistant disconnect and reconnect the engine mount control solenoid valve 2P connector from the engine mount control solenoid valve.

   Is there a noticeable change in idle smoothness when the engine mount control solenoid valve 2P connector is disconnected?

   YES – Reconnect the engine mount control solenoid valve 2P connector to the solenoid valve. The engine mount control system is OK. ■

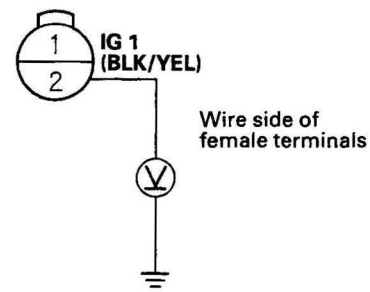
   NO – Go to step 4.

4. Shift to Park or Neutral position.

5. Disconnect the engine mount control solenoid valve 2P connector from the engine mount control solenoid valve.

6. Measure voltage between the No. 2 terminal and body ground.

   ENGINE MOUNT CONTROL SOLENOID VALVE 2P CONNECTOR



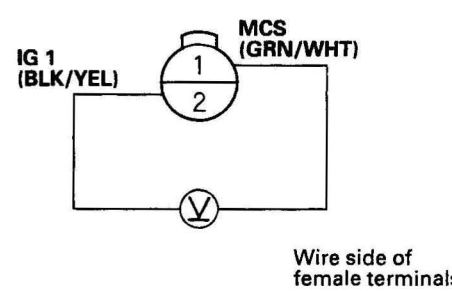
   Is there battery voltage?

   YES – Go to step 7.

   NO – Repair open in the wire between engine mount control solenoid valve and No. 6 (15A) fuse in the driver's under-dash fuse/relay box. ■

7. Measure voltage between the No. 1 terminal and No. 2 terminal.

   ENGINE MOUNT CONTROL SOLENOID VALVE 2P CONNECTOR



   Is there battery voltage?

   YES – Go to step 8.

   NO – Repair open in the wire between powertrain control module (PCM) (A2) and the engine mount control solenoid valve 2P connector. If the wire is OK, substitute a known-good PCM and recheck. ■

(cont'd)

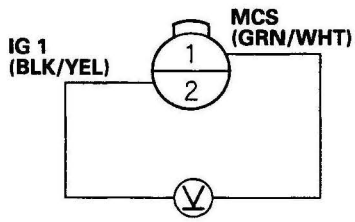
Protected by AR

Troubleshooting (cont'd)

8. Raise the engine speed above 1,000 rpm.

9. Measure voltage between the engine mount control solenoid valve 2P connector No. 1 terminal and No. 2 terminal.

ENGINE MOUNT CONTROL SOLENOID VALVE 2P CONNECTOR



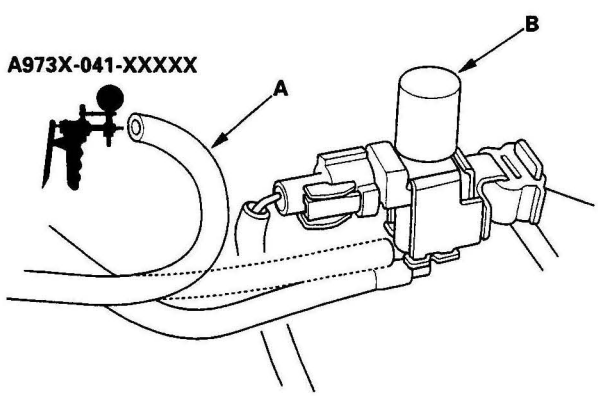
Wire side of female terminals

Is there battery voltage?

YES—Repair short to body ground in the wire between PCM (A2) and the engine mount control solenoid valve. If the wire is OK, substitute a known-good PCM and recheck.■

NO—Go to step 10.

10. Disconnect the upper vacuum hose (A) from the engine mount control solenoid valve (B), and connect a vacuum pump/gauge to the hose. Apply vacuum for 20 seconds.



Does the engine mount hold vacuum?

YES—Go to step 11.

NO—Either the vacuum hose or one of the engine mounts has a vacuum leak. Repair as needed.■

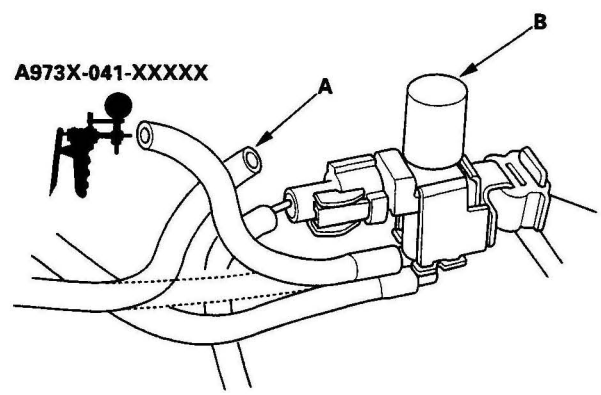
11. Release the vacuum, then apply vacuum again.

Is there a noticeable change in idle smoothness with and without vacuum applied?

YES—Go to step 12.

NO—Replace the front engine mount and/or rear engine mount.■

12. Disconnect the upper vacuum hose (A) from the engine mount control solenoid valve (B) and connect a vacuum pump/gauge to the hose.



Is there manifold vacuum at idle, and a decrease in manifold vacuum when you raise the engine speed above 1,000 rpm?

YES—Replace the engine mount control solenoid valve.■

NO—A hose is restricted or pinched or the intake manifold port is plugged.

BACK

Protected by AR

Engine Mechanical



Engine Assembly
Engine Removal 5-2
Engine Installation 5-13

Cylinder Head **6-1**

Engine Block **7-1**

Engine Lubrication **8-1**

Intake Manifold/Exhaust System **9-1**

Engine Cooling **10-1**

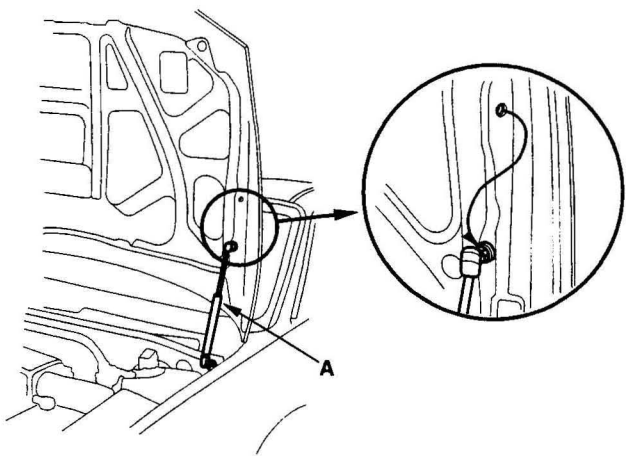
Protected by AR

Engine Removal

NOTE:
- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

1. Remove the support struts (A) from the engine hood. Move the hood to a vertical position, then reinstall the support strut as shown.

   NOTE: Do not attempt to close the hood with the support strut in the vertical position, as it will damage the support strut and hood.



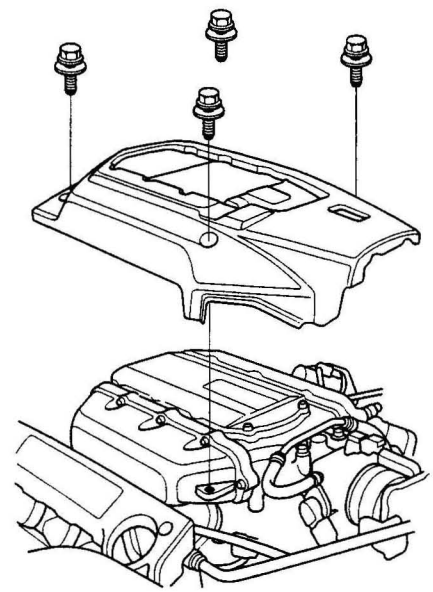
2. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.

3. Disconnect the negative cable from the battery first, then the positive cable.

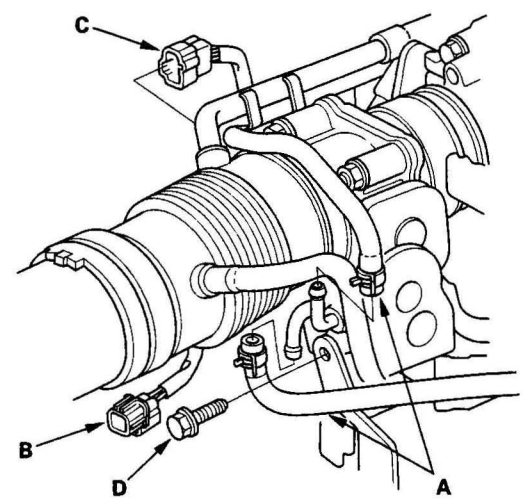
4. Remove the battery.

5. Remove the intake manifold cover ('00-03 models).

   J32A2 engine shown:



6. Remove the water bypass hoses (A). Disconnect the TCS control valve actuator connector (B) and the TCS control valve angle sensor connector (C) from the TCS control valve assembly, then remove the bolt (D) securing the TCS control valve bracket (J32A2 engine).

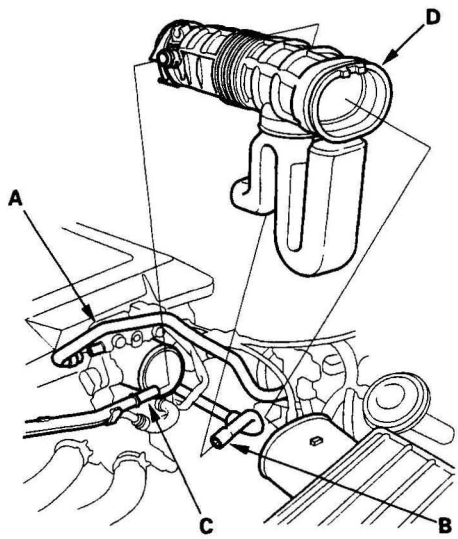


BACK

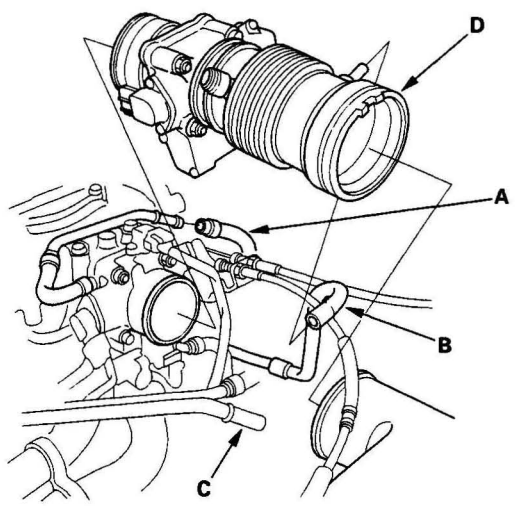
Protected by AR

7. Remove the evaporative emission (EVAP) canister hose (A) from the throttle body.

'99 model:

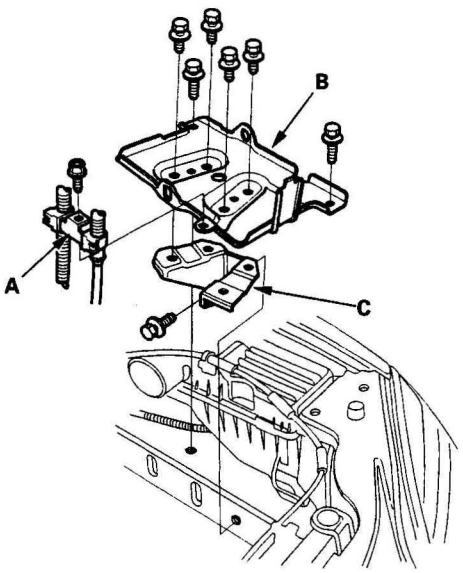


'00-03 models (J32A2 engine shown):



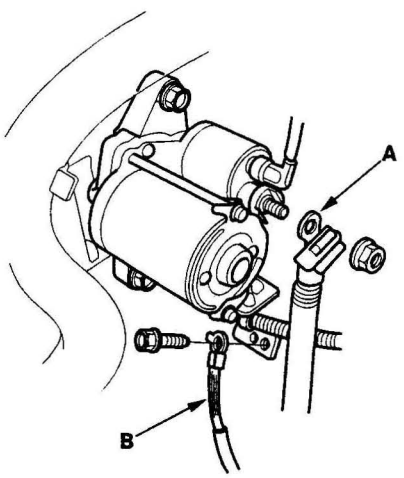
8. Remove the vacuum hose (B) and breather pipe (C), then remove the intake air duct (D).

9. Remove the harness clamp (A), then remove the battery base (B).



10. Remove the battery base bracket (C).

11. Remove the starter cable (A).



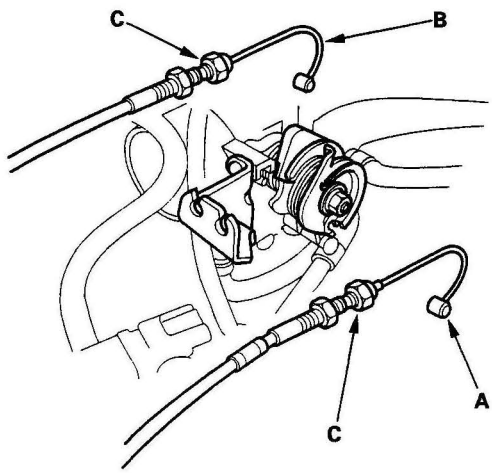
12. Remove the ground cable (B) ('02-03 models).

(cont'd)

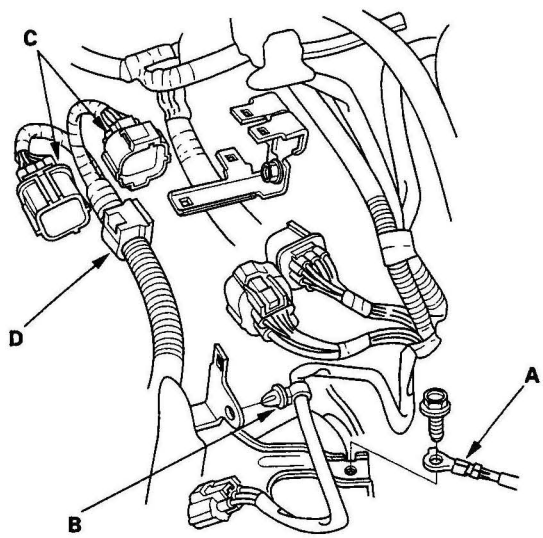
Protected by AR

Engine Removal (cont'd)

13. Remove the throttle cable (A) and cruise control cable (B) by loosening the locknuts (C), then slip the cable ends out of the accelerator linkage. Take care not to bend the cables when removing them. Always replace any kinked cable with a new one.



14. Remove the ground cable (A) and harness clamp (B) (J32A2 engine).

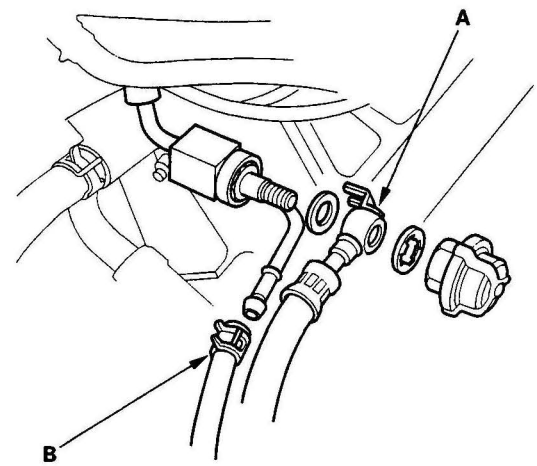


15. Disconnect the engine wire harness connectors (C), and remove the harness clamp (D) on the left side of the engine compartment.

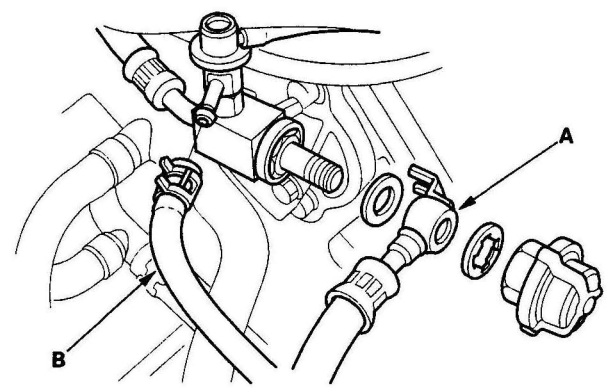
16. Relieve fuel pressure (see page 11-163).

17. Remove the fuel feed hose (A) and fuel return hose (B).

'99 model:



'00-03 models:

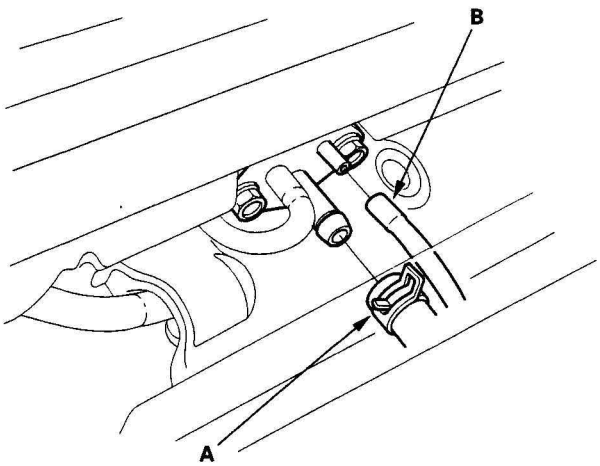


BACK

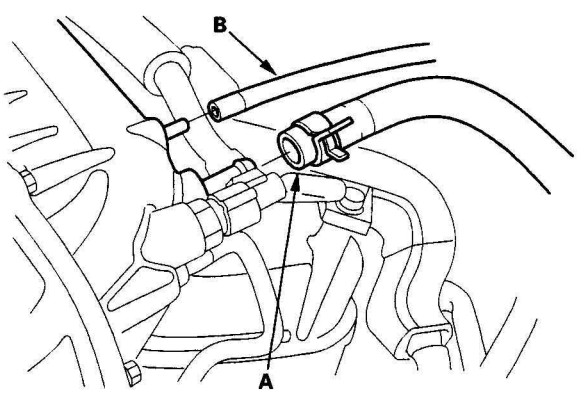
Protected by AR

18. Remove the brake booster vacuum hose (A) and vacuum hose (B).

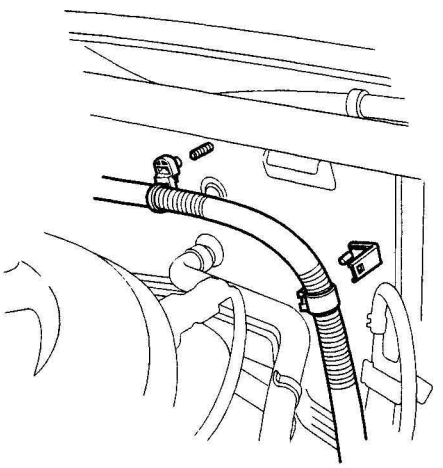
'99 model:



'00-03 models:



19. Remove the engine wire harness clamps.



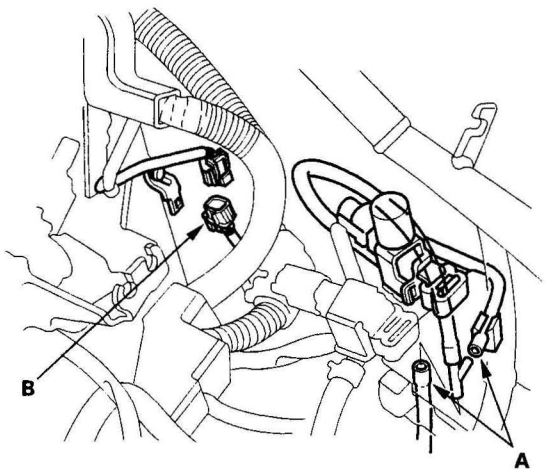
(cont'd)

BACK

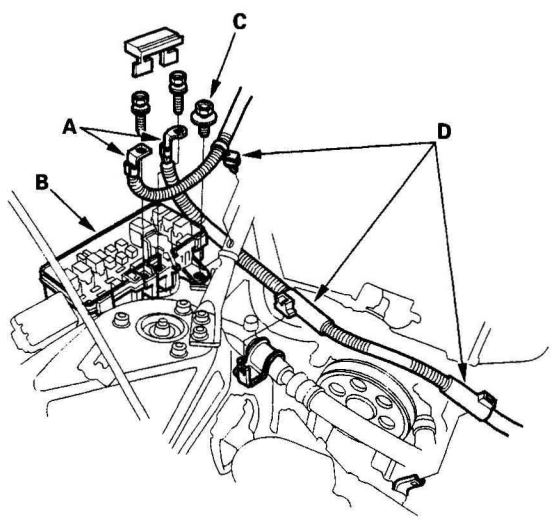
Protected by AR

Engine Removal (cont'd)

20. Remove the vacuum hoses (A), then disconnect the primary heated oxygen sensor (primary HO2S) connector (B).



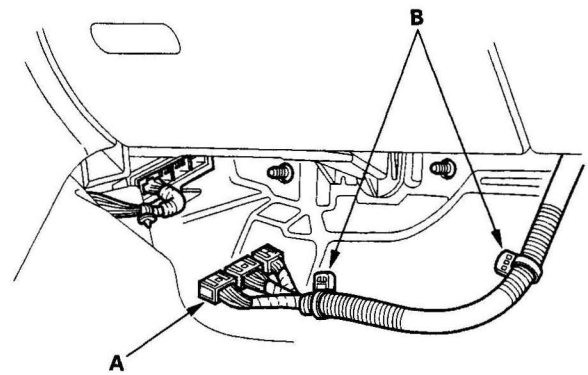
21. Remove the battery cables (A) from the under-hood fuse relay box (B).



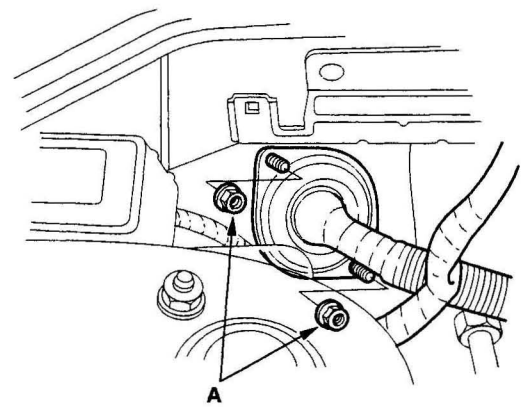
22. Remove the flange bolt (C), then remove the under-hood fuse relay box.

23. Remove the harness clamps (D).

24. Disconnect the powertrain control module (PCM) connectors (A) from the PCM, and remove the harness clamps (B).



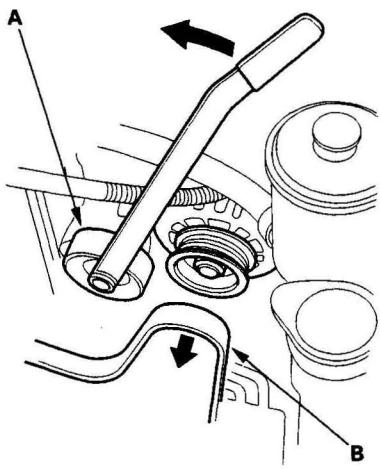
25. Remove the grommet mounting nuts (A), then pull out the engine wire harness.



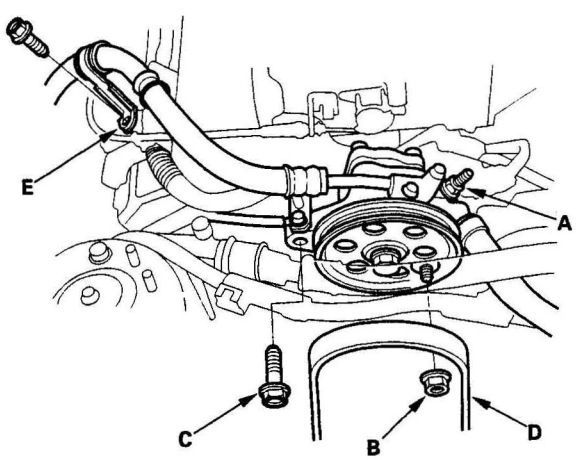
BACK

Protected by AR

26. Move the auto-tensioner (A) to remove tension from the alternator belt (B), then remove the alternator belt.

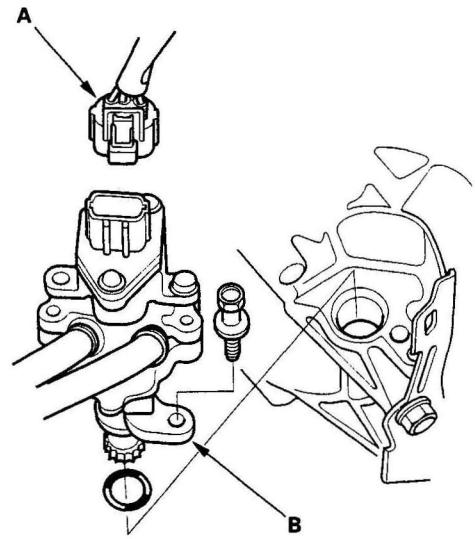


27. Loosen the adjusting nut (A), remove the locknut (B) and mounting bolt (C), then remove the power steering (P/S) pump belt (D) and pump without disconnecting the P/S hoses.



28. Remove the P/S hose clamp (E).

29. Disconnect the vehicle speed sensor (VSS) connector (A) ('99 model).



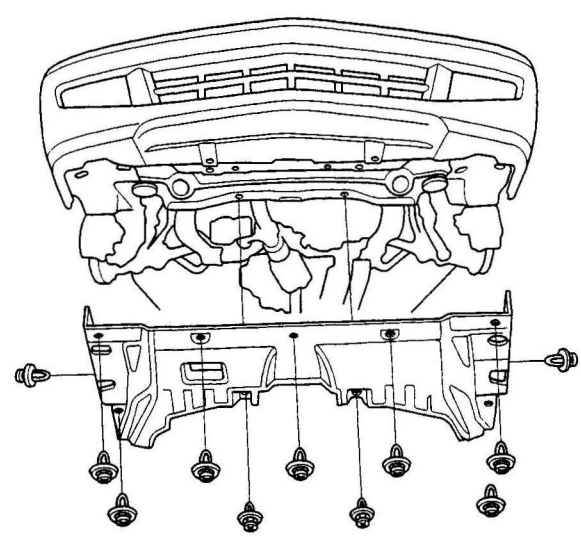
30. Remove the power steering speed sensor (B). Do not remove the hoses (J32A1 engine).

31. Remove the radiator cap.

32. Raise the hoist to full height.

33. Remove the front tires/wheels.

34. Remove the splash shield.



(cont'd)

BACK

Protected by AR

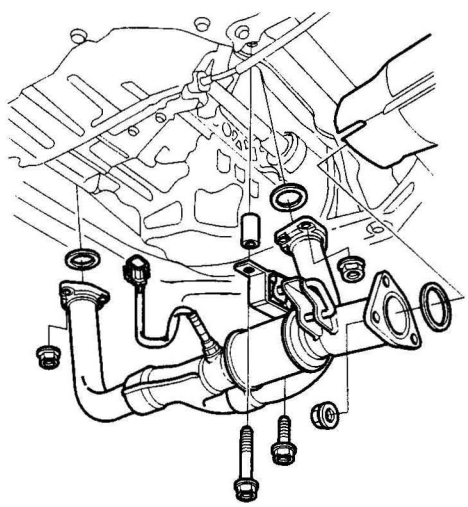
Engine Removal (cont'd)

35. Loosen the drain plug in the radiator to drain the engine coolant (see page 10-13).

36. Drain the automatic transmission fluid (ATF):
    - '99 model (see page 14-109).
    - '00-03 models (see page 14-350).

37. Drain the engine oil. Reinstall the drain bolt using a new washer (see page 8-5).

38. Remove exhaust pipe A.

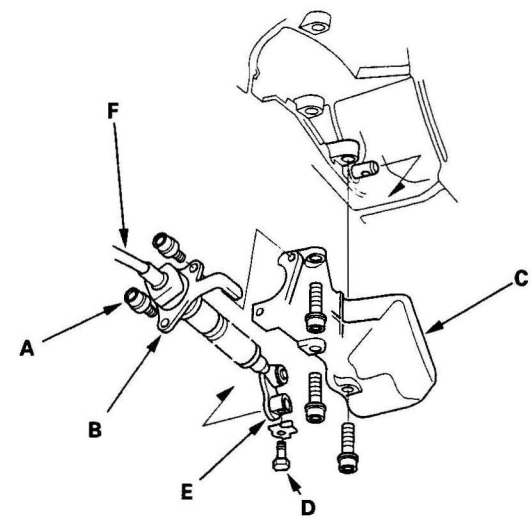


39. Remove the damper forks (see step 2 on page 18-19).

40. Disconnect the suspension lower arm ball joints (see page 18-17).

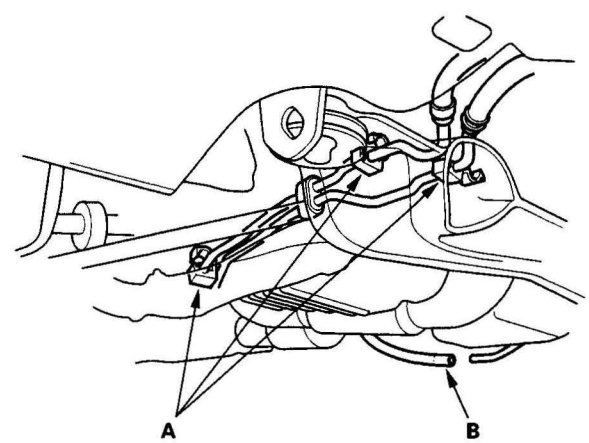
41. Remove the driveshafts (see step 10 on page 16-4). Coat all precision finished surfaces with clean engine oil. Tie plastic bags over the driveshaft ends.

42. Remove the bolts (A) securing the shift cable holder (B), then remove the shift cable cover (C). To prevent damage to the control lever joint, be sure to remove the bolts securing the shift cable holder before removing the bolts securing the shift cable cover.



43. Remove the lock bolt (D) securing the control lever (E), then remove the shift cable (F) with the control lever. Take care not to bend the shift cable while removing it.

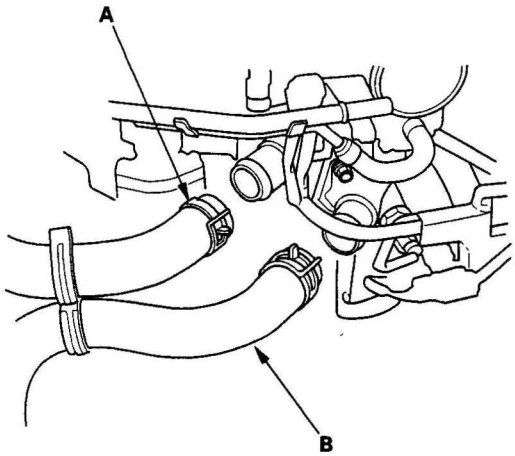
44. Unplug the P/S hose clamps (A), and disconnect the engine mount control vacuum hose (B).



BACK

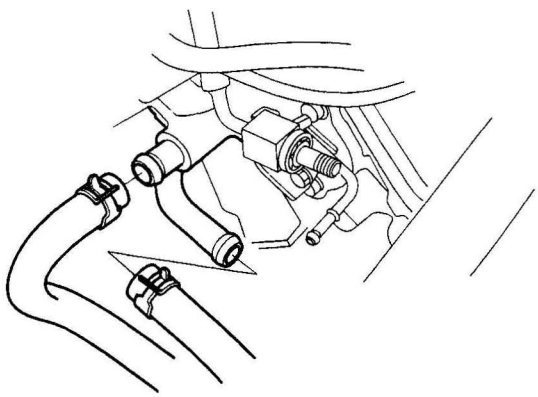
Protected by AR

45. Lower the hoist, then remove the upper radiator hose (A), and the lower radiator hose (B).

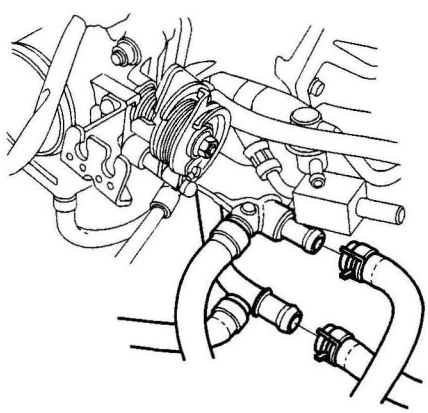


46. Remove the heater hoses.

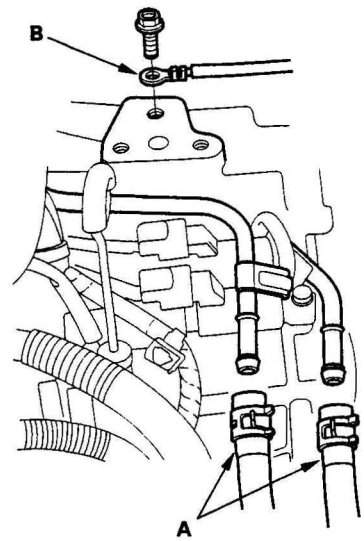
'99 model:



'00-03 models:

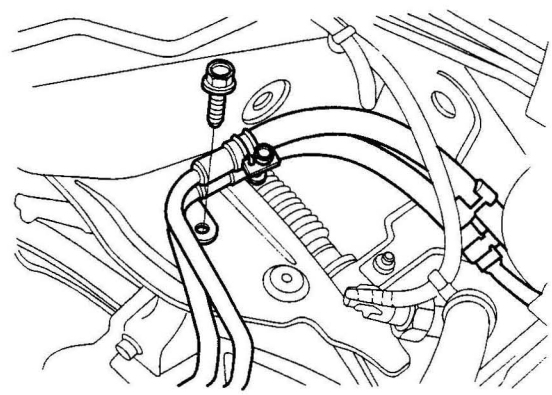


47. Remove the ATF cooler hoses (A), then plug the ATF cooler hoses and lines ('99 model).



48. Remove the ground cable (B) (J32A1 engine).

49. Remove the P/S hose clamp from the rear beam.



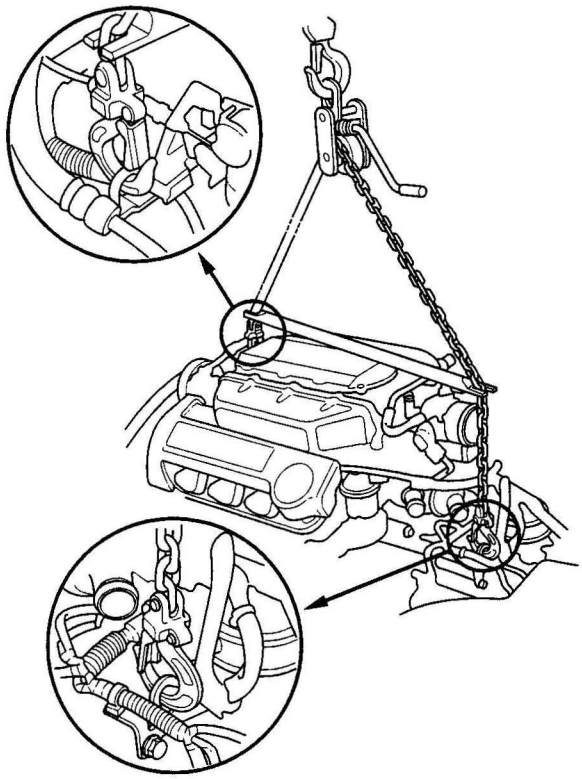
(cont'd)

BACK

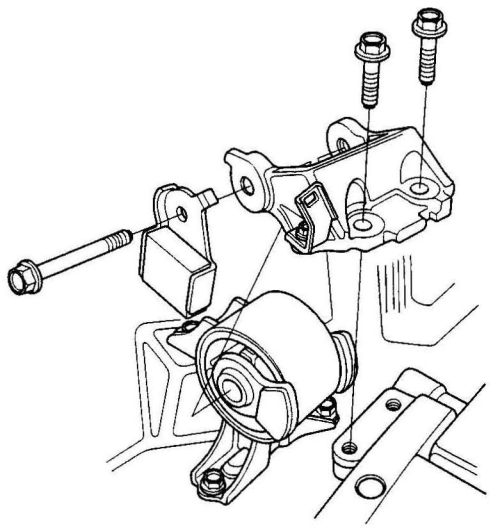
Protected by AR

Engine Removal (cont'd)

50. Attach the chain hoist to the engine as shown.

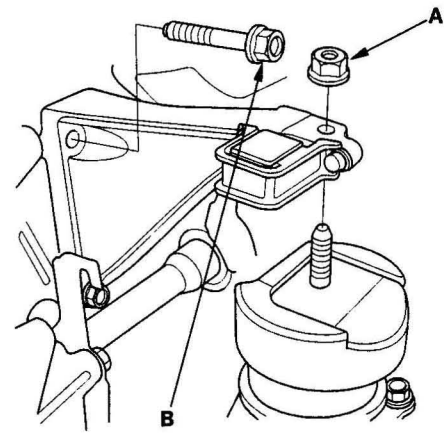


51. Remove the side engine mount bracket.

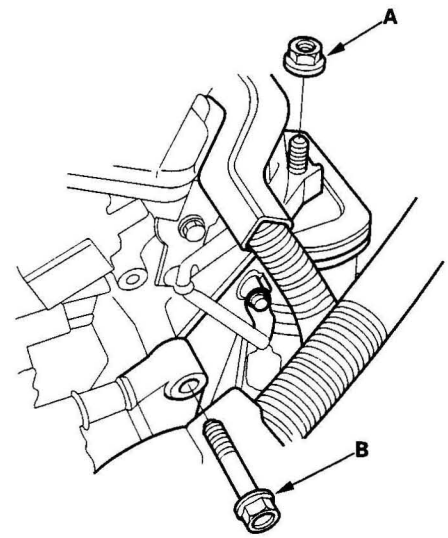


52. Remove the rear mount bracket support nut (A) and mounting bolt (B).

'99 model:



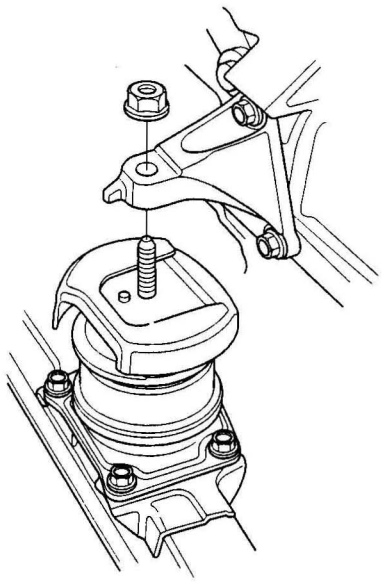
'00-03 models:



BACK

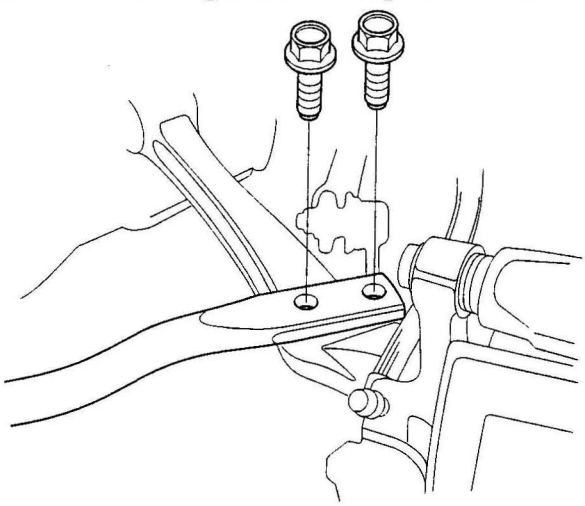
Protected by AR

53. Remove the front mount bracket support nut.

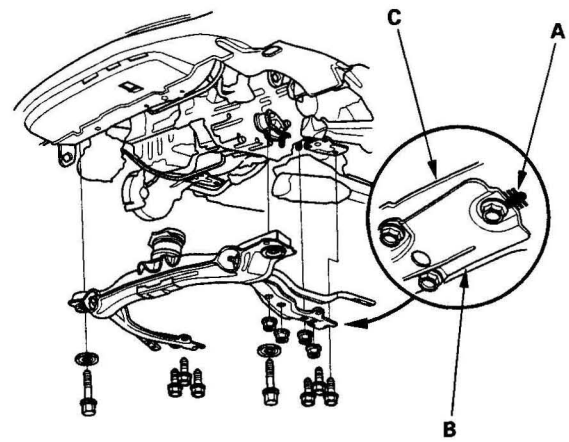


54. Make sure the hoist brackets are positioned properly. Raise the hoist to full height.

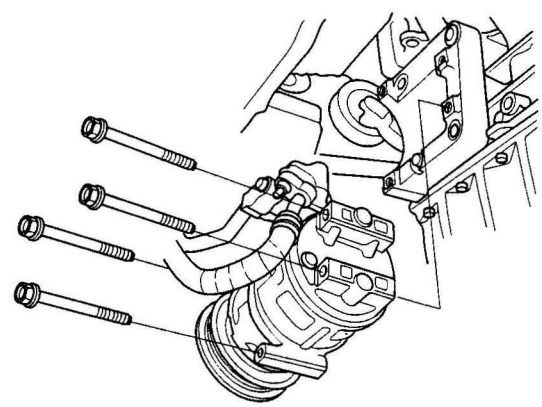
55. Remove the flange bolts securing the radius rods.



56. Make a mark (A) on the front beam (B) and rear beam (C), then remove the front beam.



57. Remove the A/C compressor without disconnecting the A/C hoses.



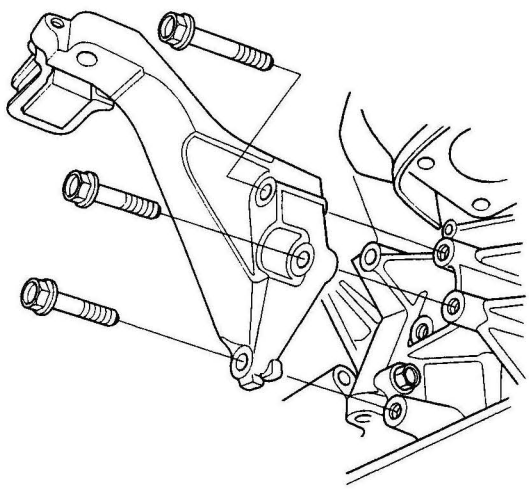
(cont'd)

Protected by AR

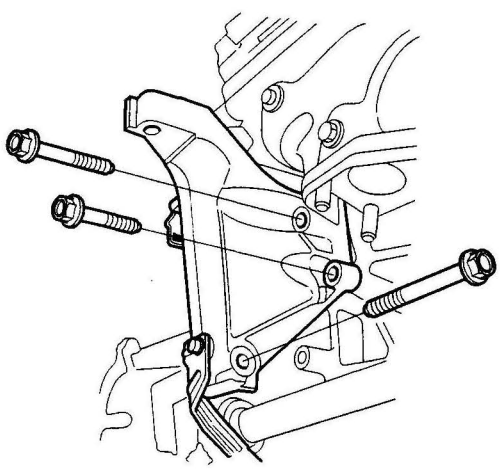
Engine Removal (cont'd)

58. Remove the rear mount bracket.

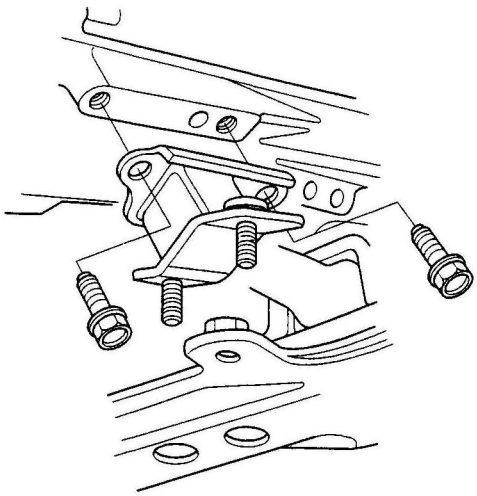
'99 model:



'00-03 models:



59. Remove the transmission lower rear mount.



60. Check that the engine/transmission is completely free of vacuum hoses, fuel and coolant hoses and electrical wiring.

61. Slowly lower the engine about 150 mm (6 in.). Check once again that all hoses and wires are disconnected from the engine/transmission.

62. Lower the engine all the way. Disconnect the chain hoist from the engine.

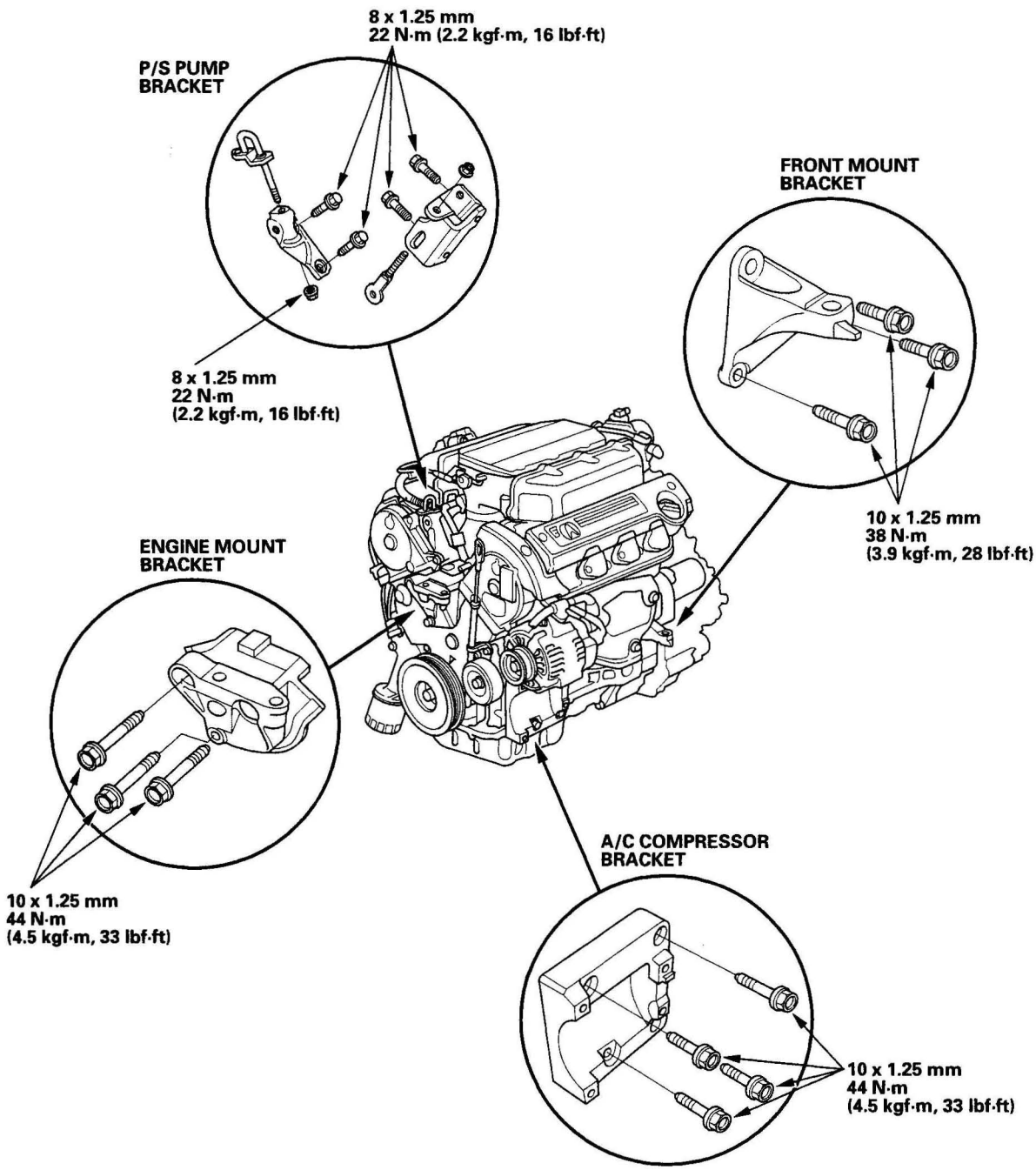
63. Remove the engine from under the vehicle.

BACK

Protected by AR

Engine Installation

1. Install the accessory brackets. Tighten their bolts and nuts to the specified torques.



(cont'd)

BACK

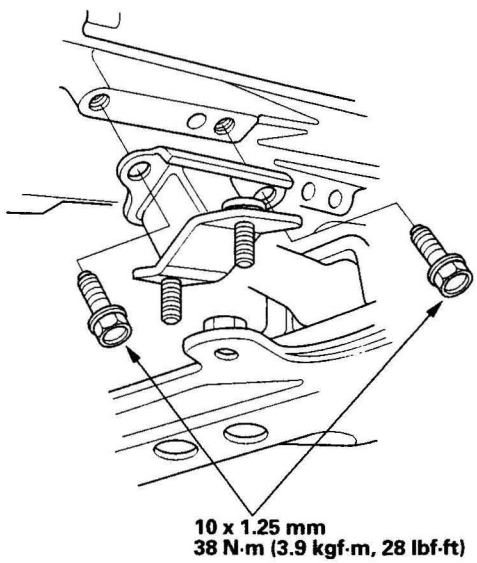
Protected by AR

Engine Installation (cont'd)

2. Position the engine under the vehicle. Attach the chain hoist to the engine, then lift the engine into position in the vehicle.

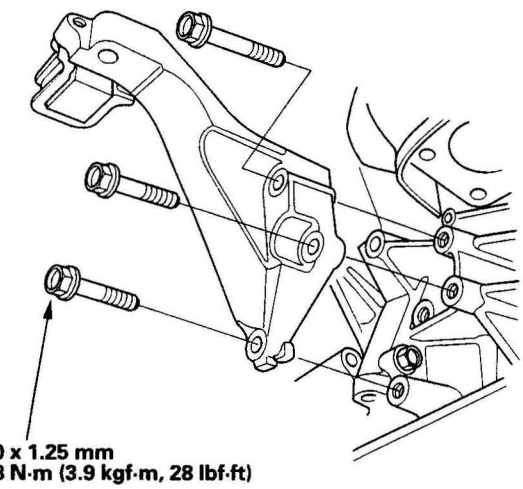
NOTICE
Reinstall the mounting bolts/nuts in the sequence given. Failure to follow this sequence may cause excessive noise and vibration, and reduce bushing life.

3. Install the transmission lower rear mount.

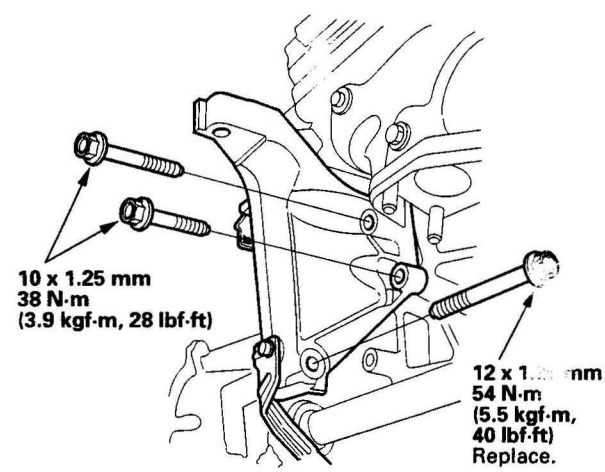


4. Install the rear mount bracket.

'99 model:



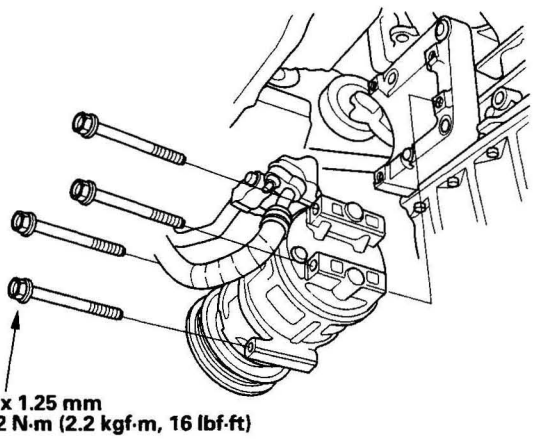
'00-03 models:



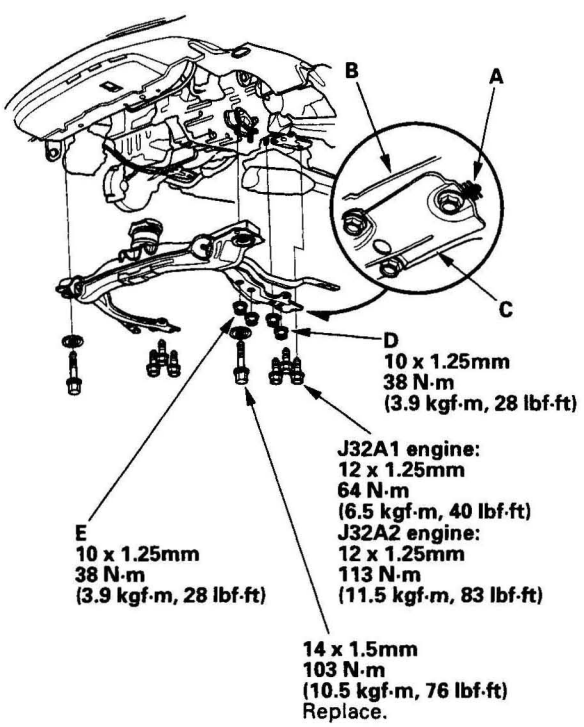
BACK

Protected by AR

5. Install the A/C compressor.

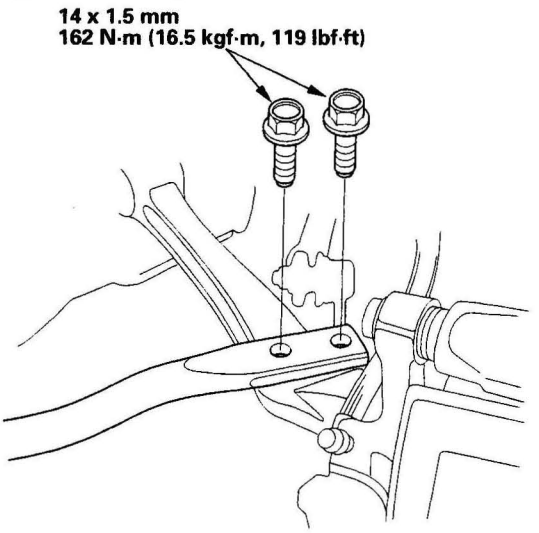


6. Install the front beam. Align mark (A) on the rear beam (B) and front beam (C), then tighten the bolts.



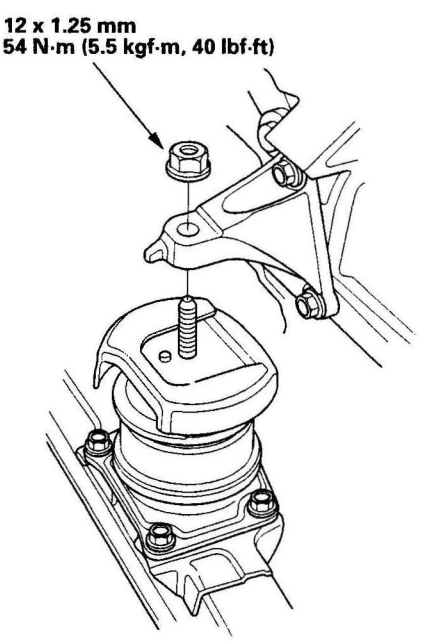
7. Tighten the transmission lower rear mount mounting nuts (D) and transmission lower front mount mounting nuts (E).

8. Tighten the flange bolts on the radius rods.



9. Lower the hoist.

10. Tighten the front mount bracket support nut.



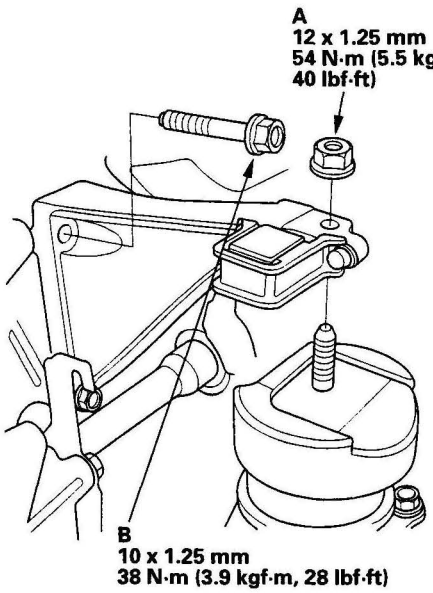
(cont'd)

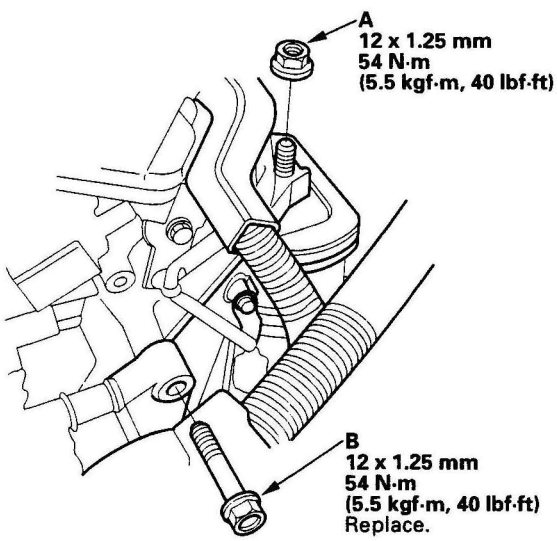
BACK

Protected by AR

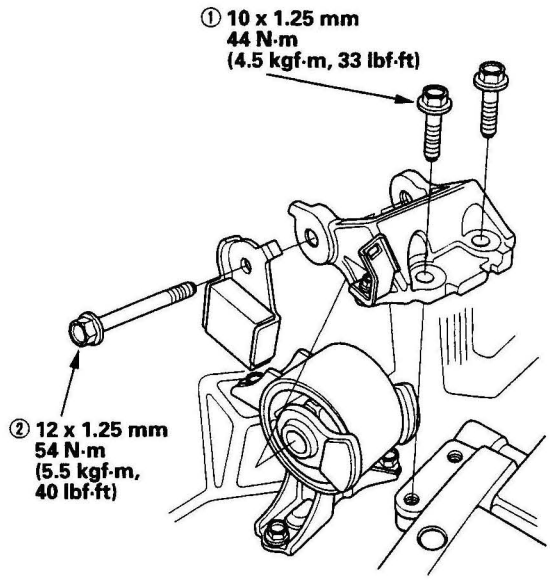
Engine Installation (cont'd)

11. Tighten the rear mount bracket support nut (A) and mounting bolt (B).





12. Install the side engine mount bracket, then tighten the mounting bolts in the numbered sequence shown.



13. Remove the chain hoist from the engine.

BACK

Protected by AR

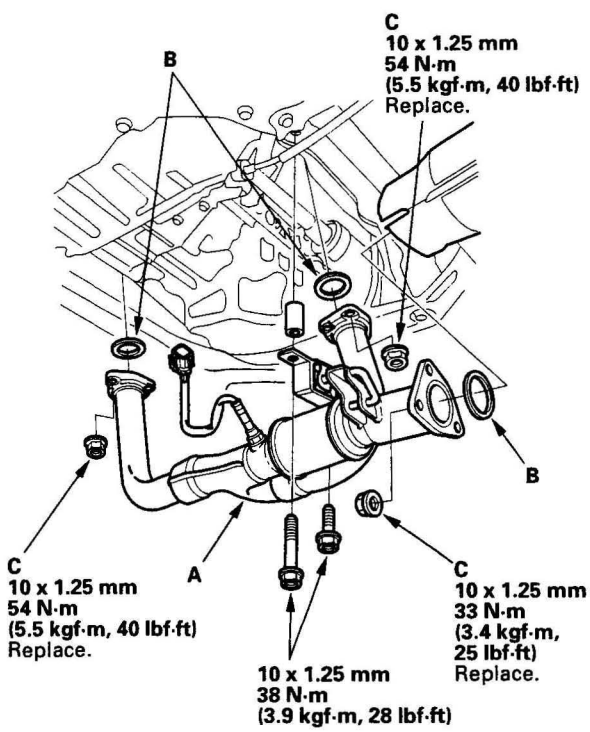
14. Raise the hoist to full height.

15. Install a new spring clip on the end of each driveshaft, then install the driveshafts. Make sure each clip "clicks" into place in the differential and intermediate shaft.

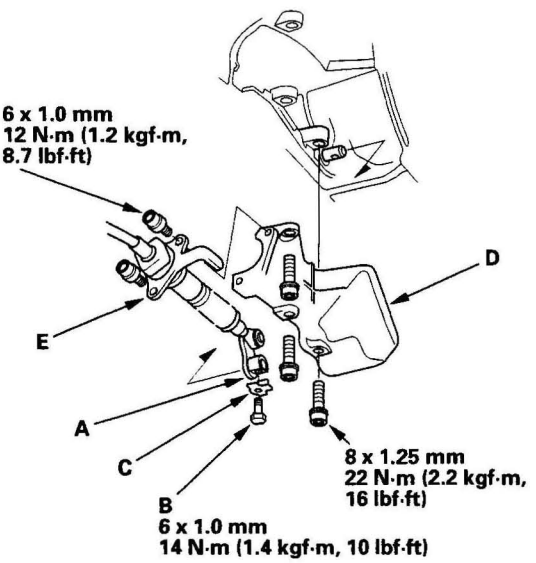
16. Connect the suspension lower arm ball joints. Use new cotter pins (see page 18-17).

17. Install the damper fork (see step 2 on page 18-21).

18. Install exhaust pipe A (A); use new gaskets (B) and new self locking nuts (C).



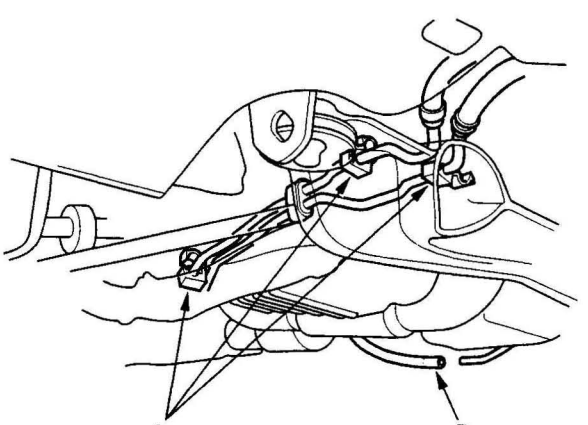
19. Install the control lever (A) with the shift cable, on the control shaft. Do not bend the shift cable any more than is necessary to install the control lever.



20. Install the lock bolt (B) with a new lock washer (C), then bend the lock tab of the lock washer.

21. Install the shift cable cover (D), then install the shift cable holder (E) on the shift cable cover.

22. Install the power steering (P/S) hose on the clamps (A), and connect the engine mount control vacuum hose (B).



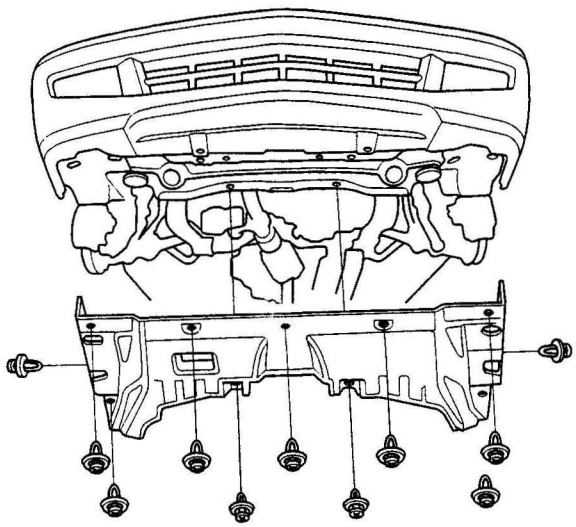
(cont'd)

BACK

Protected by AR

Engine Installation (cont'd)

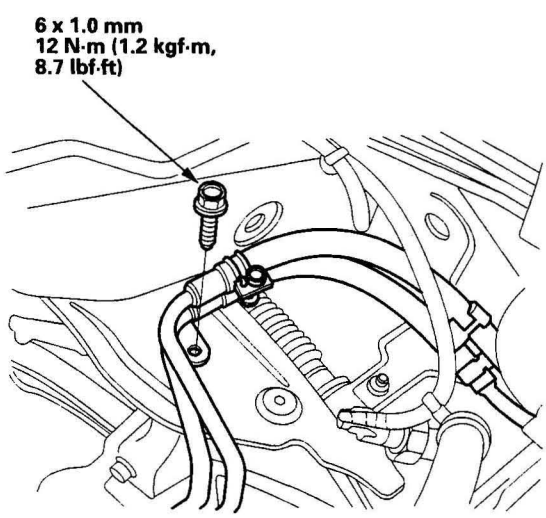
23. Install the splash shield.



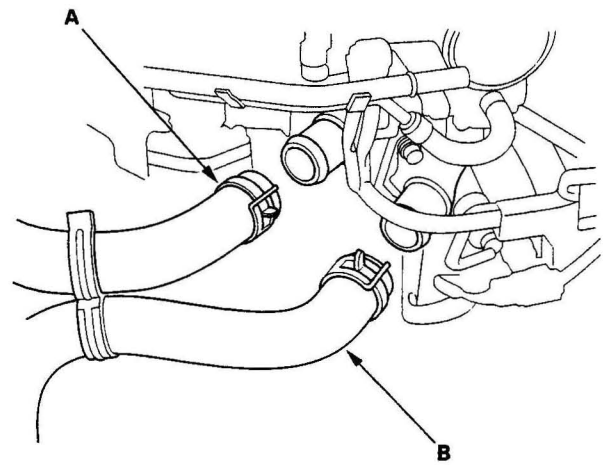
24. Install the front tires/wheels.

25. Lower the hoist.

26. Install the P/S hose clamp.

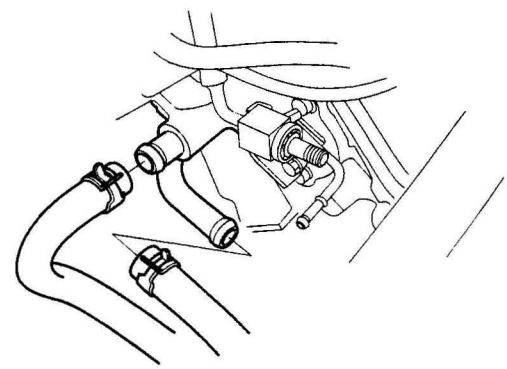


27. Install the upper radiator hose (A) and lower radiator hose (B).

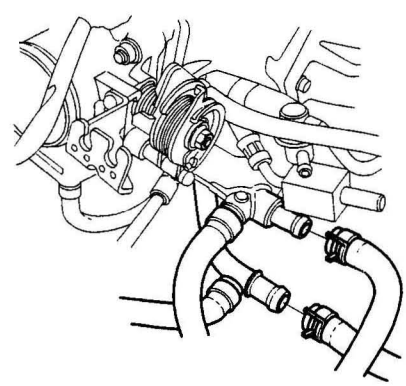


28. Install the heater hoses.

'99 model:



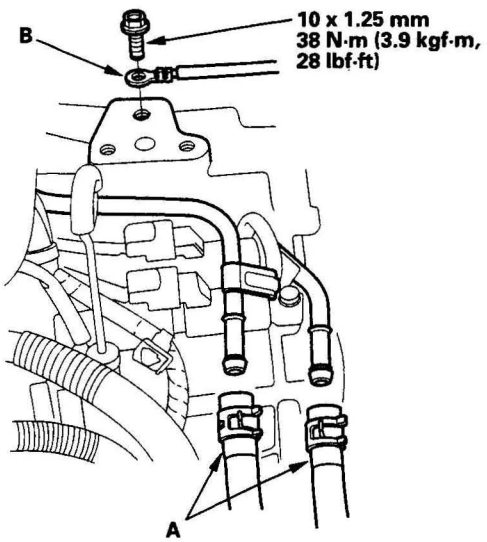
'00-03 models:



BACK

Protected by AR

29. Install the automatic transmission fluid (ATF) cooler hoses (A) ('99 model).



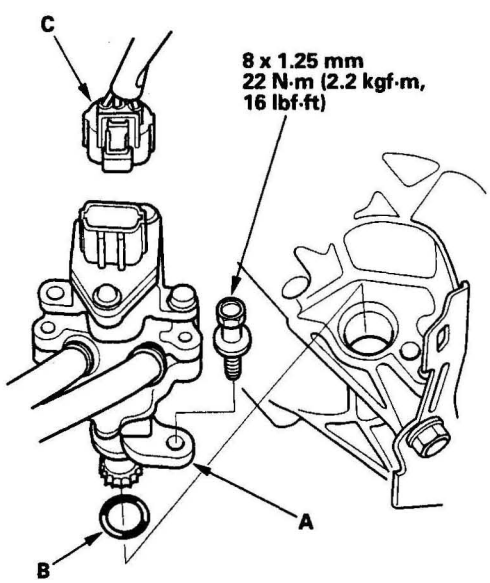
30. Install the ground cable (B) (J32A1 engine).

31. Install the alternator belt.

32. Loosely install the P/S pump belt and pump.

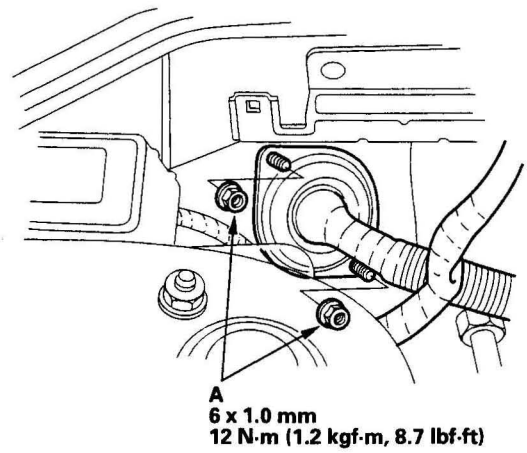
33. Adjust the P/S pump belt (see page 17-14).

34. Install the power steering speed sensor (A) with a new O-ring (B).

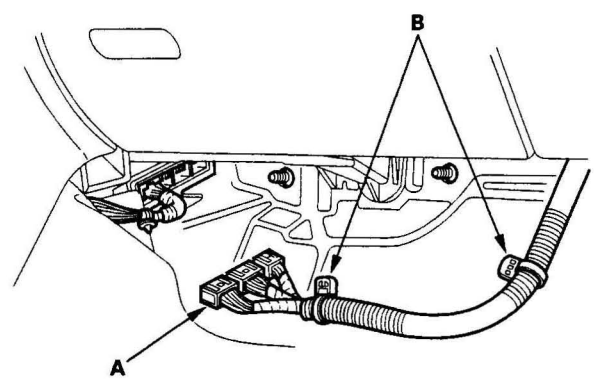


35. Connect the vehicle speed sensor (VSS) connector (C) ('99 model).

36. Push the powertrain control module (PCM) connectors through the bulkhead. Install the grommet, and tighten the mounting nuts (A).



37. Connect the PCM connector (A), and install the harness clamps (B).

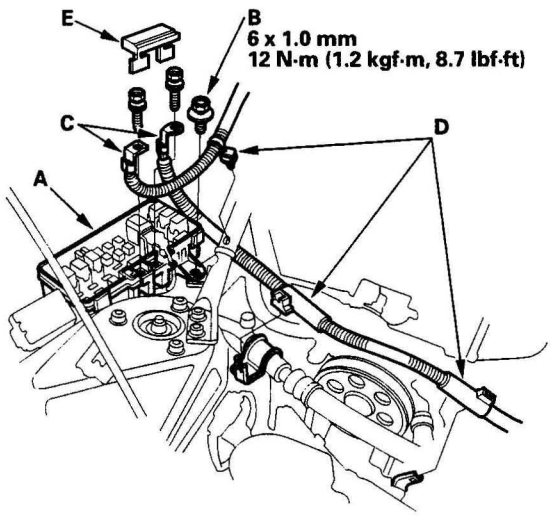


(cont'd)

Protected by AR

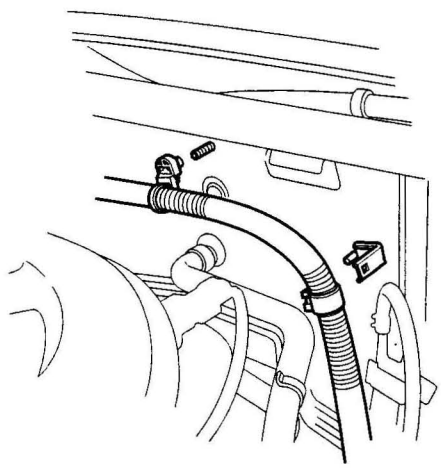
Engine Installation (cont'd)

38. Install the under-hood fuse relay box (A), and tighten the flange bolt (B).

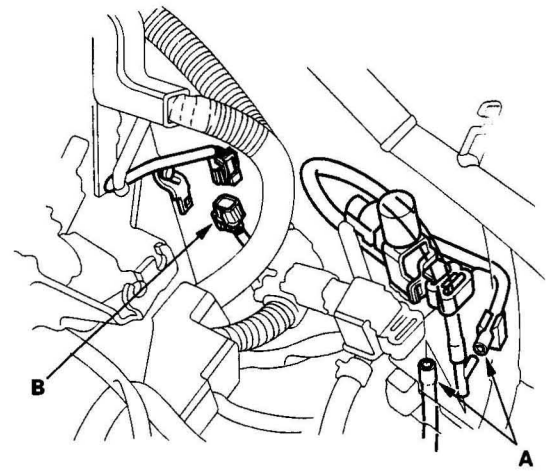


39. Install the battery cables (C) on the under-hood fuse relay box. Install the harness clamps (D). Install the battery cable grommet (E).

40. Install the engine wire harness clamps.



41. Install the vacuum hoses (A), then connect the primaly heated oxygen sensor (primary HO2S) connector (B).

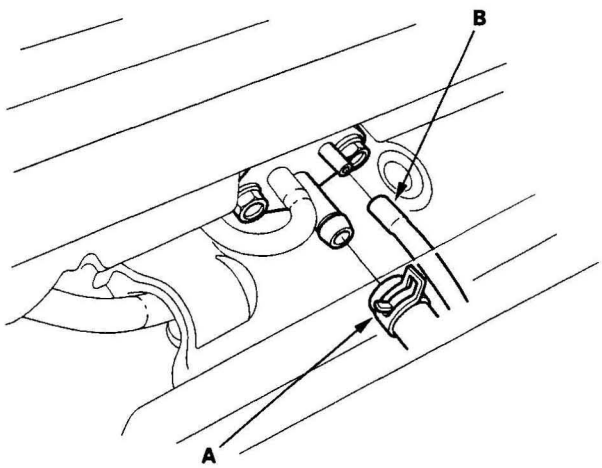


BACK

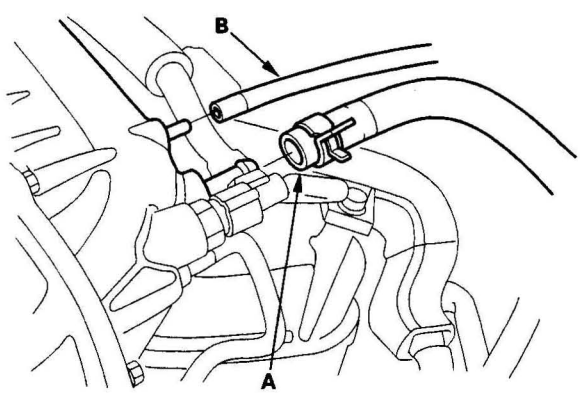
Protected by AR

42. Install the brake booster vacuum hose (A) and vacuum hose (B).

'99 model:

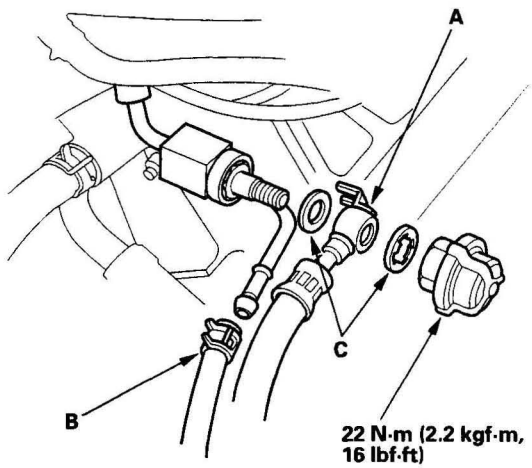


'00-03 models:

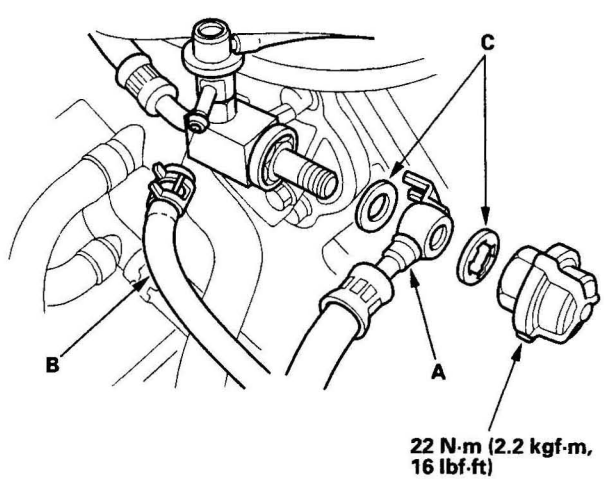


43. Install the fuel feed hose (A) and fuel return hose (B) with new washers (C).

'99 model:



'00-03 models:



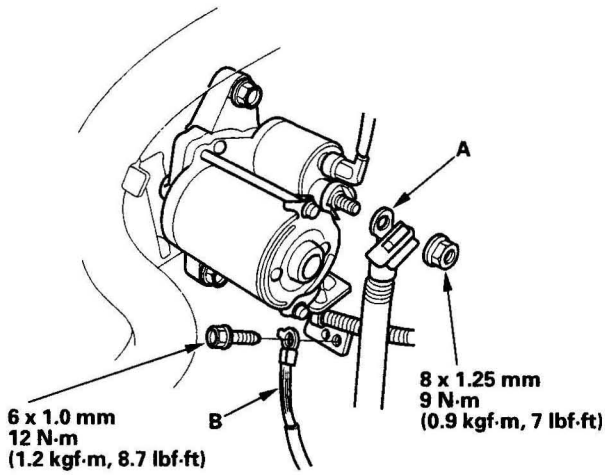
(cont'd)

BACK

Protected by AR

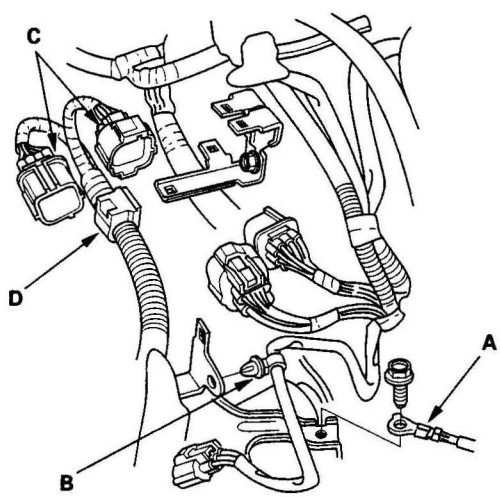
Engine Installation (cont'd)

44. Install the starter cable (A).



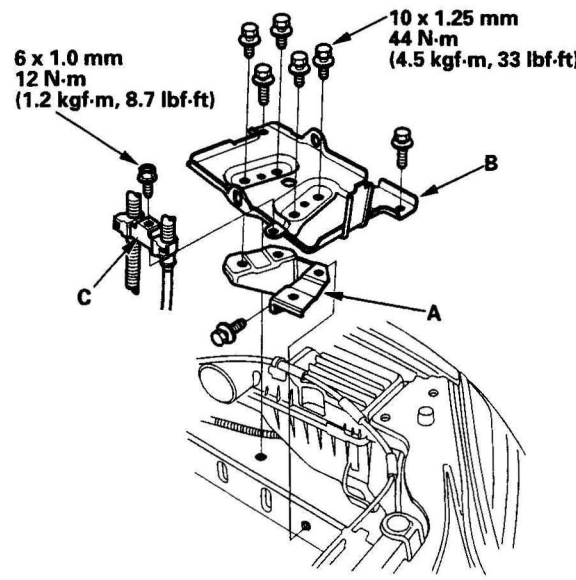
45. Install the ground cable (B) ('02-03 models).

46. Install the ground cable (A) and harness clamp (B) (J32A2 engine).



47. Connect the engine wire harness connectors (C), and install the harness clamp (D) on the left side of the engine compartment.

48. Install the battery base bracket (A), then install the battery base (B) and harness clamp (C).

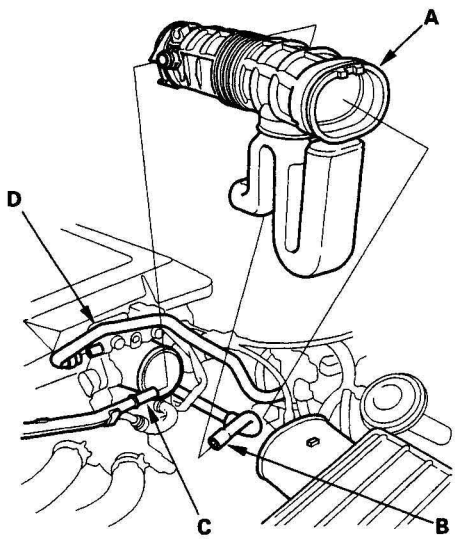


BACK

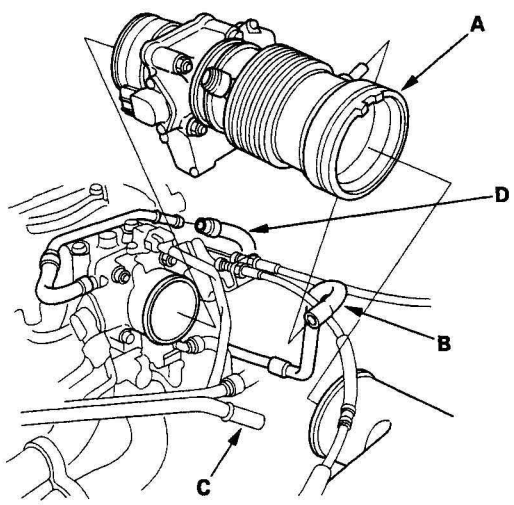
Protected by AR

49. Install the intake air duct (A), then install the vacuum hose (B) and breather pipe (C).

'99 model:



'00-03 models (J32A2 engine shown):

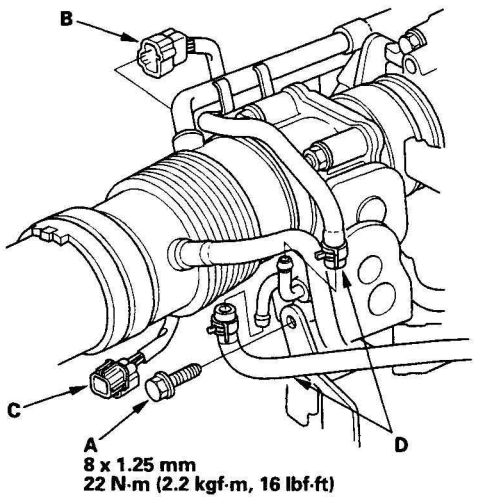


50. Install the evaporative emission (EVAP) canister hose (D).

51. Install and adjust the cruise control cable (see page 4-44).

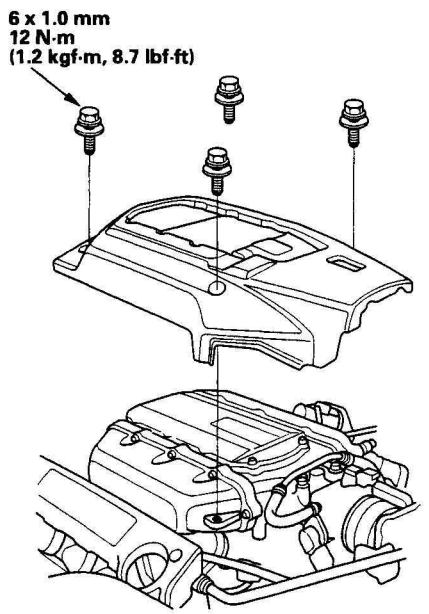
52. Install and adjust the throttle cable (see page 11-188).

53. Tighten the bolt (A) securing the TCS control valve bracket. Connect the TCS control valve angle sensor connector (B), TCS control valve actuator connector (C) and water bypass hoses (D) on the TCS control valve assembly (J32A2 engine).



54. Install the intake manifold cover ('00-03 models).

J32A2 engine shown:



(cont'd)

BACK

Protected by AR

Engine Installation (cont'd)

55. Install the battery. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.

56. Refill the engine with engine oil (see page 8-5).

57. Refill the automatic transmission fluid (ATF):
    - '99 model (see page 14-109).
    - '00-03 models (see page 14-350).

58. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-13).

59. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

60. Inspect for fuel leaks. Turn the ignition switch ON (II) (do not operate the starter) so the fuel pump runs for about 2 seconds and pressurizes the fuel line. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.

61. Perform the PCM idle learn procedure (see page 11-158).

62. Perform the power window control unit reset procedure ('02-03 models) (see page 22-308).

63. Inspect the idle speed (see page 11-157).

64. Inspect the ignition timing (see page 4-16).

65. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

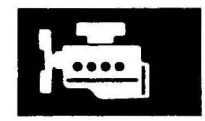
BACK

Protected by AR

Engine Mechanical

Cylinder Head

Special Tools 6-2
Component Location Index 6-3
DTC Troubleshooting 6-6
VTEC Solenoid Valve Test 6-9
Engine Compression Inspection 6-10
VTEC Rocker Arms Test 6-11
Valve Clearance Adjustment 6-13
Crankshaft Pulley Removal and Installation 6-16
Timing Belt Inspection 6-17
Timing Belt Removal 6-18
Timing Belt Installation 6-21
Cylinder Head Cover Removal 6-31
Cylinder Head Cover Installation 6-32
Cylinder Head Removal 6-34
Cylinder Head Inspection for Warpage 6-38
Rocker Arm Assembly Removal 6-38
Rocker Arms and Shafts Disassembly/Reassembly 6-39
Rocker Arms and Shafts Inspection 6-40
VTEC Lost Motion Assemblies Inspection 6-41
Camshaft Inspection 6-42
Valves, Springs, and Valve Seals Removal 6-45
Valve Inspection 6-46
Valve Stem-to-Guide Clearance Inspection 6-47
Valve Guide Replacement 6-48
Valve Seat Reconditioning 6-50
Valves, Springs, and Valve Seals Installation 6-52
Camshaft/Rocker Arms, Camshaft Seal, and Pulley Installation 6-53
Cylinder Head Installation 6-54
CMP (TDC) Sensor Replacement 6-59
CKP Sensor Replacement 6-60



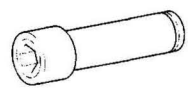
Protected by AR

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07HAH-PJ7010B	Valve Guide Reamer, 5.5 mm	1
②	07JAA-001020A	Socket, 19 mm	1
③	07JAB-001020A	Holder Handle	1
④	07MAB-PY3010A	Holder Attachment, 50 mm, Offset	1
⑤	07NAJ-P07010A	Pressure Gauge Adaptor	1
⑥	07VAJ-P8A010A	VTEC Air Adaptor	1
⑦	07VAJ-P8A020A	VTEC Air Stopper	1
⑧-1	07406-0070300	A/T Low Pressure Gauge W/Panel	1
⑧-2	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	1
⑧-3	07MAJ-PY40120	A/T Pressure Hose Adapter	1
⑨	07742-0010100	Valve Guide Driver, 5.5 mm	1
⑩	07757-PJ1010A	Valve Spring Compressor Attachment	1



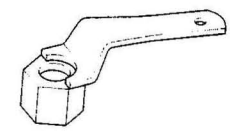
①



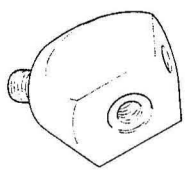
②



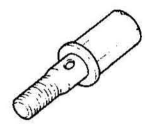
③



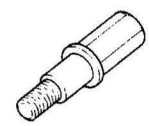
④



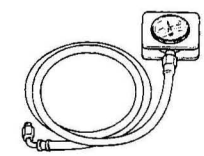
⑤



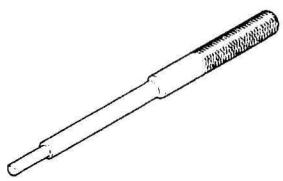
⑥



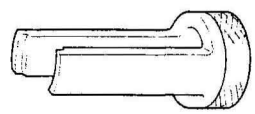
⑦



⑧-1, ⑧-2, ⑧-3



⑨

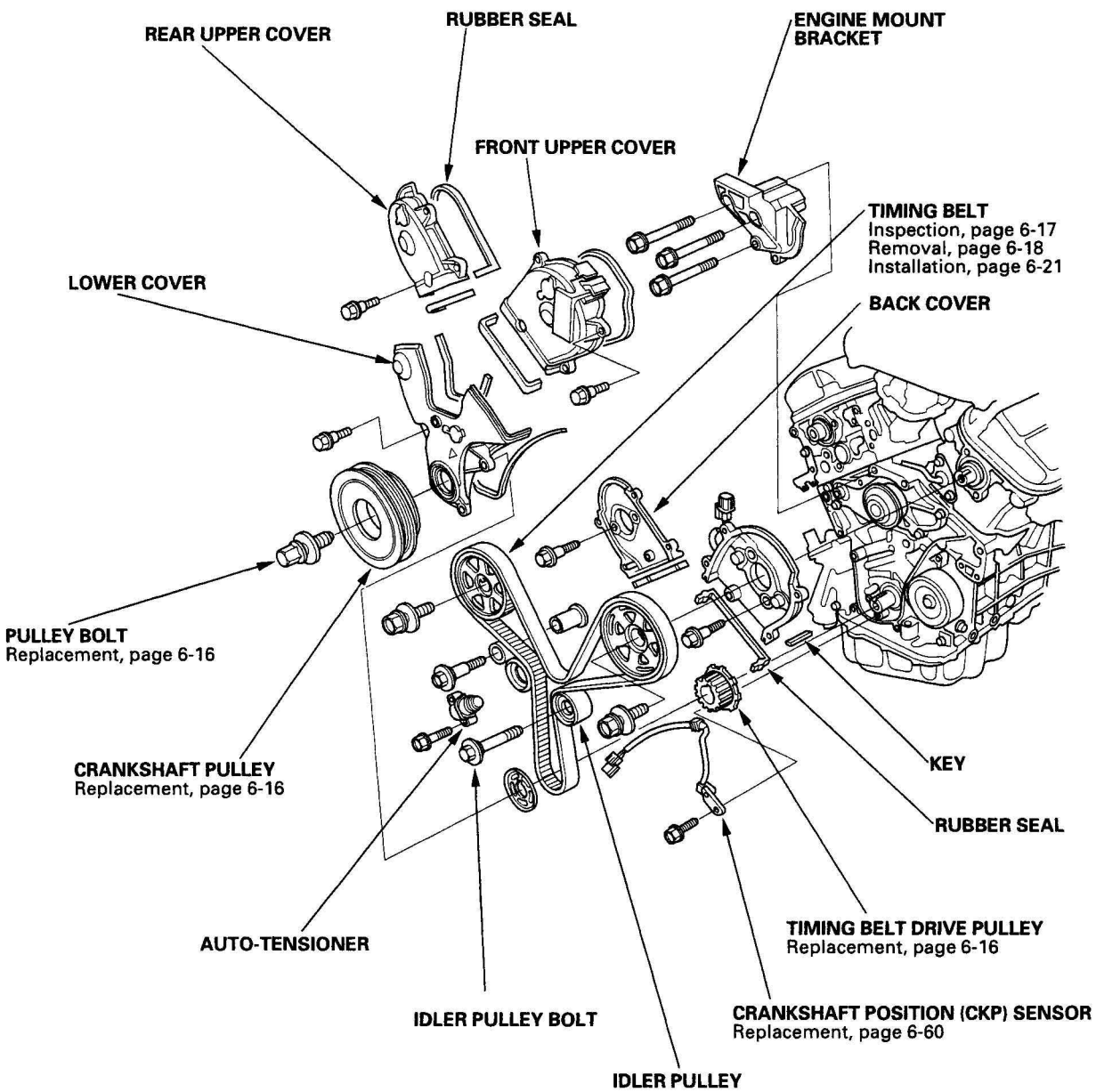


⑩

BACK

Protected by AR

Component Location Index

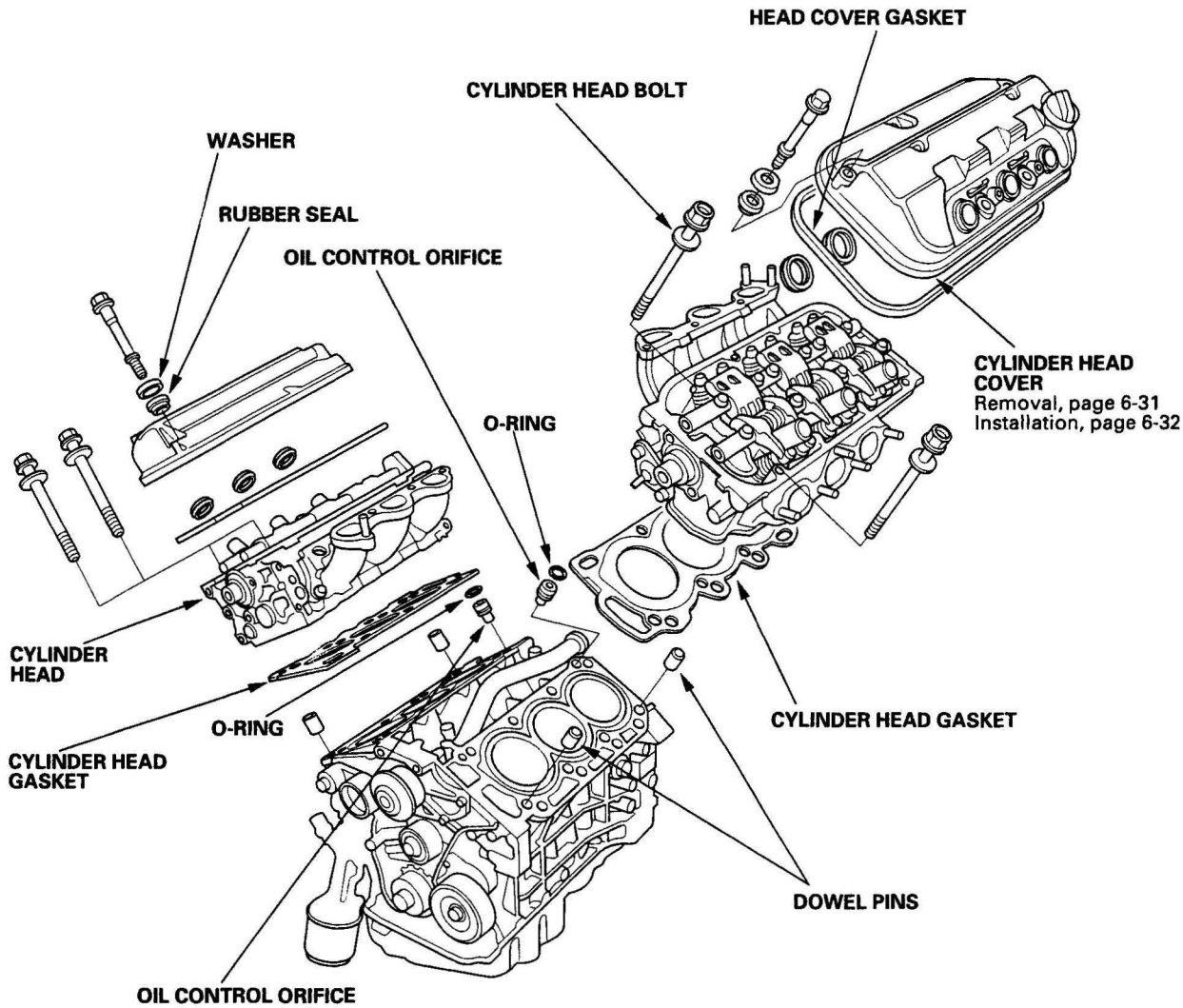


(cont'd)

BACK

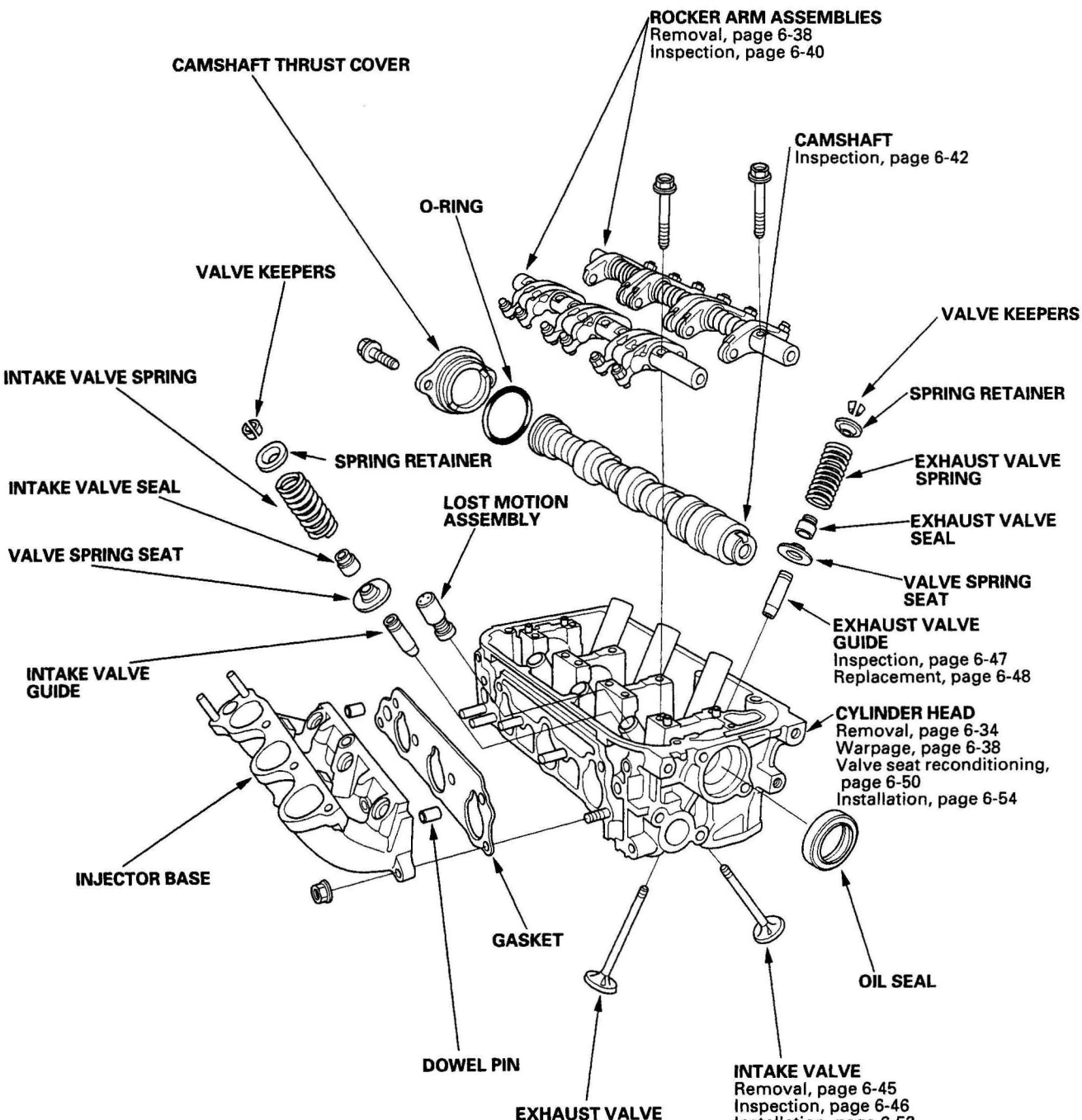
Protected by AR

Component Location Index (cont'd)



BACK

Protected by AR



BACK

Protected by AR

DTC Troubleshooting

DTC P1259: A problem in the VTEC Oil Pressure Switch circuit or VTEC Solenoid Valve circuit.

Special Tools Required
- Pressure Gauge Adaptor 07NAJ-P07010A
- A/T Low Pressure Gauge W/Panel 07406-0070300
- A/T Pressure Hose, 2,210 mm 07MAJ-PY4011A
- A/T Pressure Adaptor 07MAJ-PY40120

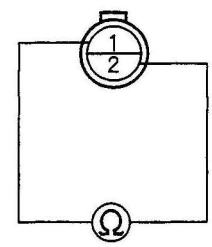
1. Do the powertrain control module (PCM) reset procedure (see page 11-4).
2. Start the engine.
3. Warm up the engine to normal operating temperature (cooling fan comes on).
4. Road Test the vehicle:
   Accelerate in 1st gear to an engine speed over 4,000 rpm. Hold that engine speed for at least 2 seconds. If DTC P1259 is not repeated during the first road test, repeat this test two more times.

   Is DTC P1259 indicated?

   YES – Go to step 5.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the VTEC solenoid valve and PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the VTEC oil pressure switch 2P connector.
7. Check for continuity on the VTEC oil pressure switch between the pressure switch 2P connector terminals No. 1 and No. 2.

VTEC OIL PRESSURE SWITCH 2P CONNECTOR



Terminal side of male terminals

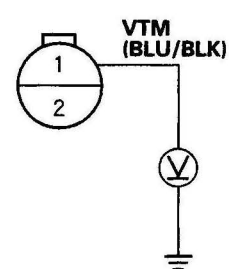
Is there continuity?

YES – Go to step 8.

NO – Replace the VTEC oil pressure switch. ■

8. Turn the ignition switch ON (II).
9. Measure the voltage between VTEC oil pressure switch harness 2P connector No. 1 terminal and body ground.

VTEC OIL PRESSURE SWITCH HARNESS 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

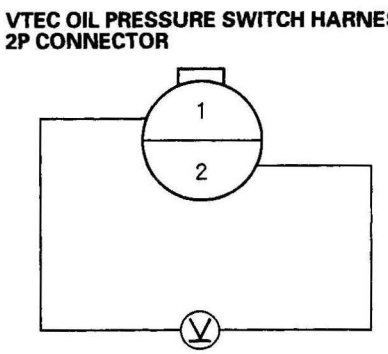
YES – Go to step 10.

NO – Inspect for an open or short to ground in the wire between the VTEC oil pressure switch and the PCM (C10). If the wire is OK, substitute a known-good PCM and recheck. ■

BACK

Protected by AR

10. Measure voltage across the VTEC oil pressure switch harness 2P connector.



Is there battery voltage?

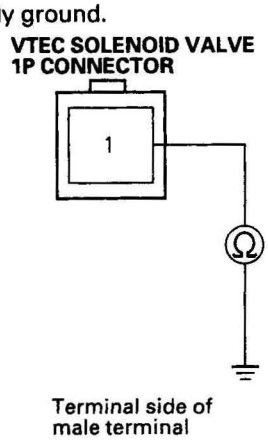
YES – Go to step 11.

NO – Repair open in the wire between the VTEC oil pressure switch and G101. If the wire is OK, substitute a known-good PCM and recheck. ■

11. Turn the ignition switch OFF.

12. Disconnect the VTEC solenoid valve 1P connector.

13. Check for continuity on the VTEC solenoid valve between the solenoid valve 1P connector terminal and body ground.

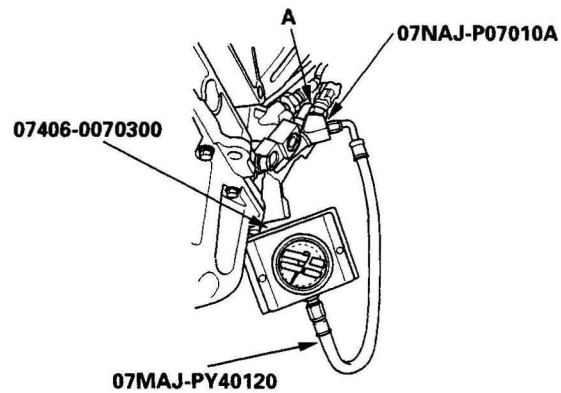


Is there 14 – 30 Ω ?

YES – Go to step 14.

NO – Replace the VTEC solenoid valve. ■

14. Remove the VTEC oil pressure switch (A) and install the special tools as shown, then reinstall the VTEC oil pressure switc.



15. Reconnect the VTEC solenoid valve 1P connector and VTEC oil pressure switch 2P connector.

16. Connect a tachometer.

17. Warm up the engine to normal operating temperature (cooling fan comes on).

18. Check oil pressure at engine speeds of 1,000, 2,000 and 3,000 rpm. Keep measuring time as short as possible because the engine is running with no load (less than 1 minute).

Is pressure below 49 kPa (0.5 kgf/cm², 7 psi)?

YES – Go to step 19.

NO – Inspect the VTEC solenoid valve (see page 6-9). ■

19. Turn the ignition switch OFF.

20. Disconnect the VTEC solenoid valve 1P connector.

21. Attach the battery positive terminal to the VTEC solenoid valve terminal.

22. Start the engine and check oil pressure at an engine speed of 3,000 rpm.

Is pressure above 390 kPa (4.0 kgf/cm², 57 psi)?

YES – Go to step 23.

NO – Inspect the VTEC solenoid valve (see page 6-9). ■

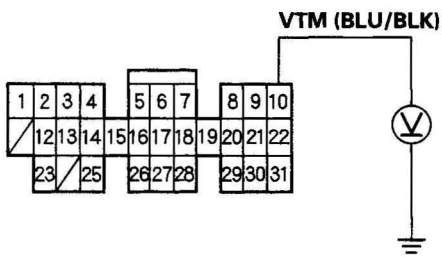
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

23. With the battery positive terminal still connected to the VTEC solenoid valve, measure voltage between C10 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there battery voltage above 4,000 rpm?

YES – Go to step 24.

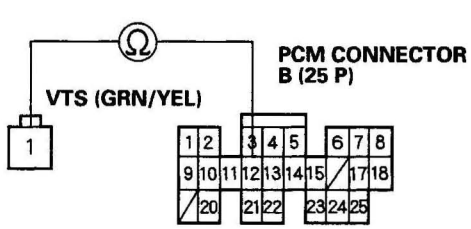
NO – Replace the VTEC oil pressure switch. ■

24. Turn the ignition switch OFF.

25. Disconnect the battery positive terminal from the VTEC solenoid valve terminal.

26. Check for continuity between the VTEC solenoid valve harness 1P connector terminal and the PCM connector terminal B12.

VTEC SOLENOID VALVE HARNESS
1P CONNECTOR



Wire side of female terminals

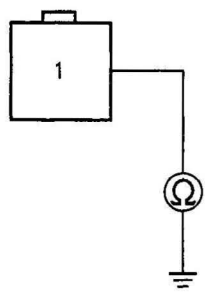
Is there continuity?

YES – Go to step 27.

NO – Repair open in the wire between the PCM (B12) and VTEC solenoid valve connector. ■

27. Check for continuity between the VTEC solenoid valve 1P connector terminal and body ground.

VTEC SOLENOID VALVE HARNESS
1P CONNECTOR



Wire side of female terminal

Is there continuity?

YES – Repair short in the wire between the PCM (B12) and VTEC solenoid valve connector. ■

NO – Substitute a known-good PCM and recheck. If symptom/indication goes away, replace the original PCM. ■

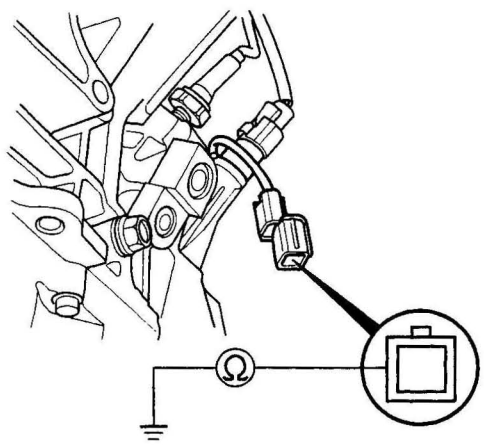
BACK

Protected by AR

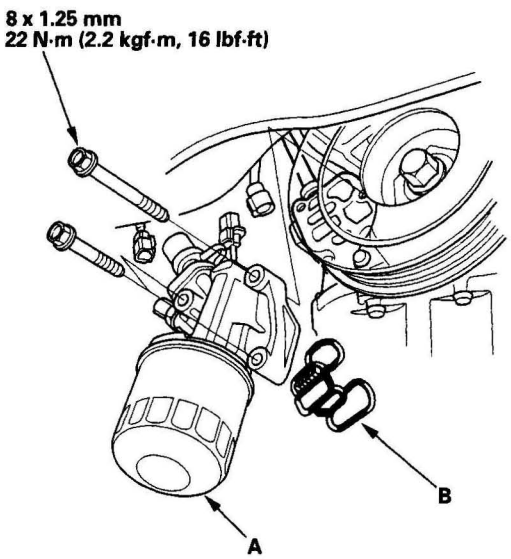
VTEC Solenoid Valve Test

1. Disconnect the 1P connector from the VTEC solenoid valve.
2. Measure resistance between the terminal and body ground.

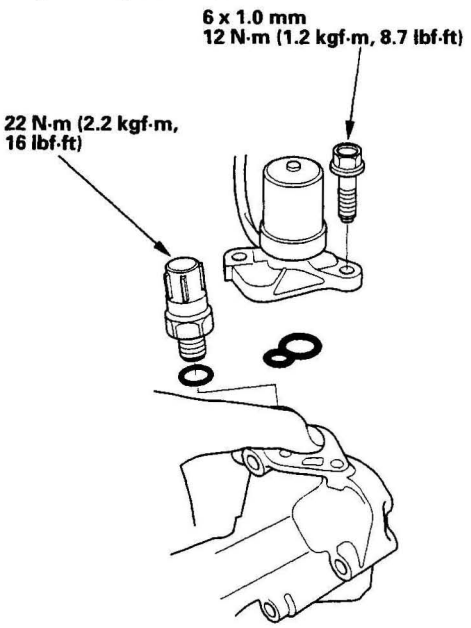
   Resistance: 14—30 Ω



3. If the resistance is within specifications, remove the VTEC solenoid valve/oil filter assembly (A) from the oil pump, and check the VTEC solenoid valve filter (B) for clogging. If there is clogging, replace the engine oil filter and the engine oil.



4. If the filter is not clogged, push the VTEC solenoid valve with your finger and check its movement. If the VTEC solenoid valve is normal, check the engine oil pressure.



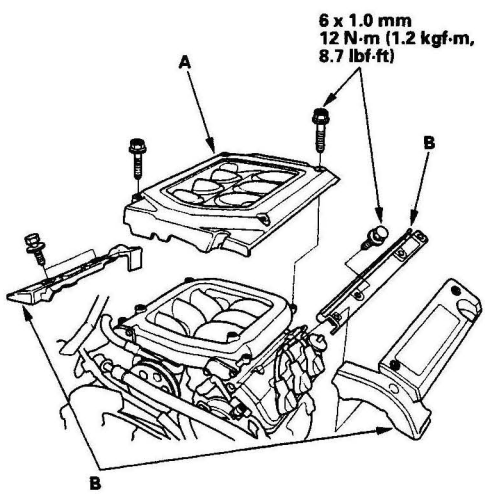
BACK

Protected by AR

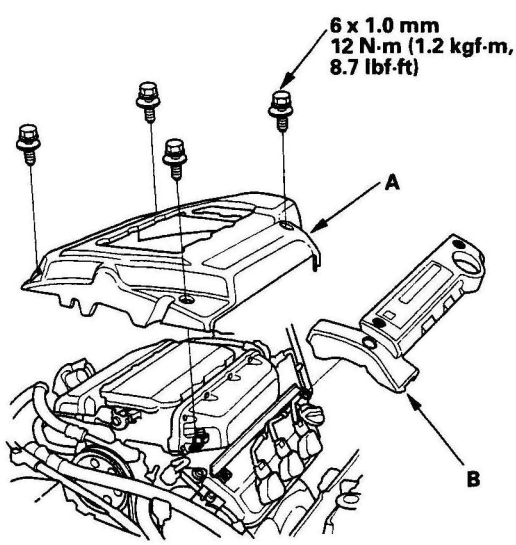
Engine Compression Inspection

1. Warm up the engine to normal operating temperature (cooling fan comes on).
2. Turn the ignition switch OFF.
3. Remove the No. 1 (15A) fuse from the driver's under-dash fuse/relay box.
4. Start the engine and let it run until it stalls.
5. Remove the intake manifold cover (A) and ignition coil cover(s) (B).

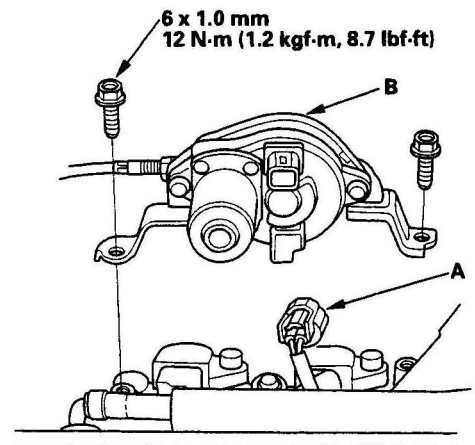
'99 model:



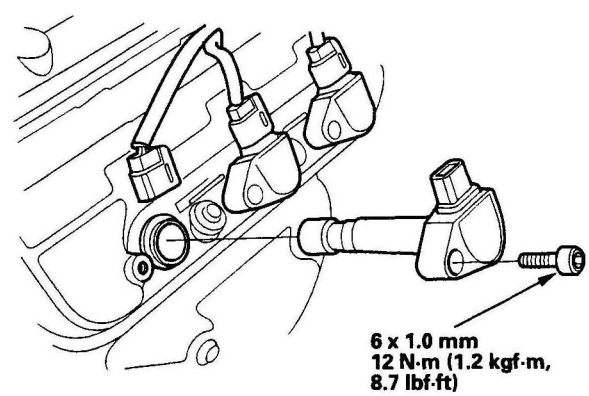
'00-03 models (J32A2 engine shown):



6. Disconnect the intake manifold runner control (IMRC) actuator connector (A), then remove the IMRC actuator (B) (J32A2 engine).



7. Remove the six ignition coils from the front and rear cylinder head.

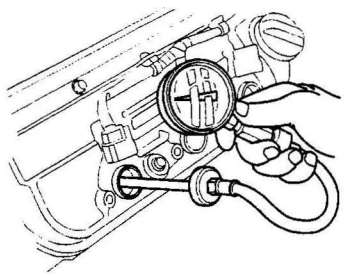


BACK

Protected by AR

8. Remove the six spark plugs.

9. Attach the compression gauge to a spark plug hole.



10. Connect a tachometer.

11. Open the throttle fully, then crank the engine with the starter motor and measure the compression.

Compression Pressure:
Above 930 kPa (9.5 kgf/cm², 135 psi)-200rpm

12. Perform the same measurement on the remaining cylinders.

Maximum Variation:
Within 200 kPa (2.0 kgf/cm², 28 psi)

13. If the compression is not within specifications, check the following items, then remeasure the compression.

- Damaged or worn valves and seats
- Damaged cylinder head gasket
- Damaged or worn piston rings
- Damaged or worn piston and cylinder bore

VTEC Rocker Arm Test

Special Tools Required
- VTEC Air Adaptor 07VAJ-P8A010A
- VTEC Air Stopper 07VAJ-P8A020A

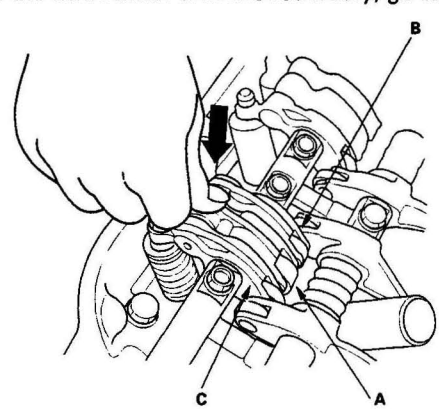
1. Remove the cylinder head covers. (see page 6-31).

2. Remove the front upper cover (see page 6-17).

3. Set the No. 1 piston at top dead center (TDC) (see step 3 on page 6-13).

4. Push on the intake mid rocker arm (A) for the No. 1 cylinder. The mid rocker arm should move independently of the primary rocker arm (B) and secondary rocker arm (C).

   - If the intake mid rocker arm does not move, remove the mid, primary, and secondary intake rocker arms as an assembly, and check that the pistons in the mid and primary rocker arms move smoothly.
     If any rocker arm needs replacing, replace the primary, mid and secondary rocker arms as an assembly, and retest.
   - If the mid rocker arm moves freely, go to step 5.



5. Repeat step 4 on the remaining intake mid rocker arms with each piston at TDC. When all the mid rocker arms pass the test, go to step 6.

6. Check that the air pressure on the shop air compressor gauge indicates over 690 kPa (7.0 kgf/cm², 100 psi).

7. Inspect the valve clearance (see page 6-13).

8. Cover the timing belt with a shop towel to protect the belt.

(cont'd)

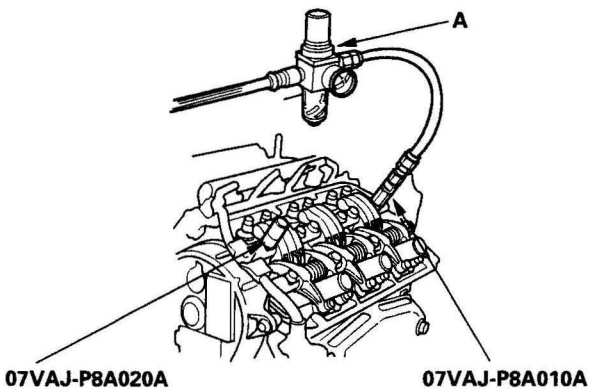
BACK

Protected by AR

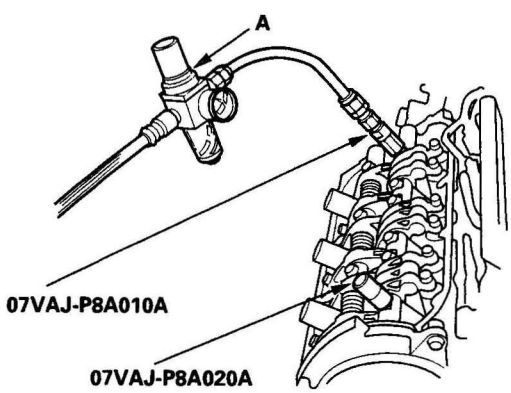
VTEC Rocker Arm Test (cont'd)

9. Remove the two end intake rocker shaft mounting bolts, then install and connect the special tools and an air pressure regulator with a 0 – 100 psi gauge (A) as shown below.

FRONT:



REAR:

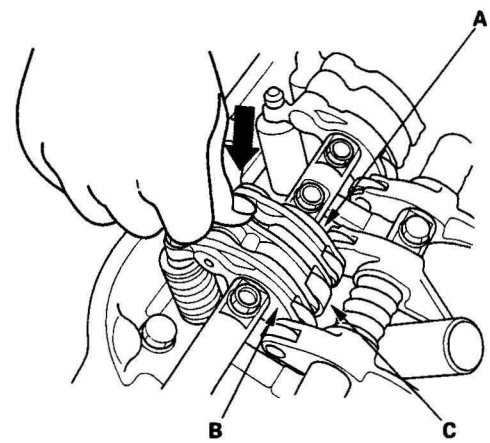


10. Loosen the valve on the regulator, and apply the specified air pressure.

Specified Air Pressure:
440-540 kPa (4.5-5.5 kgf/cm², 64-78 psi)

NOTE: If the synchronizing pistons A and B do not move after applying air pressure, move the primary or secondary rocker arm up and down manually.

11. Make sure that the intake primary rocker arm (A) and intake secondary rocker arm (B) are mechanically connected by the piston and that the mid rocker arm (C) does not move when pushed manually. If any intake mid rocker arm moves independently of the primary and secondary rocker arms, replace the rocker arms as a set.



12. Remove the tools.

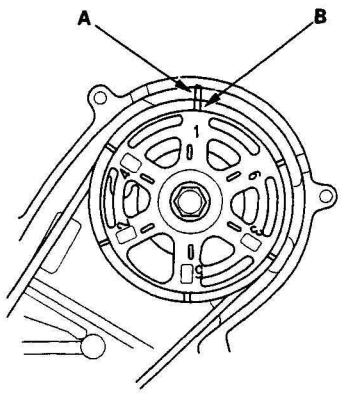
13. Check for smooth operation of each lost motion assembly (see page 6-41). Replace the lost motion assembly if it does not move smoothly.

BACK

Protected by AR

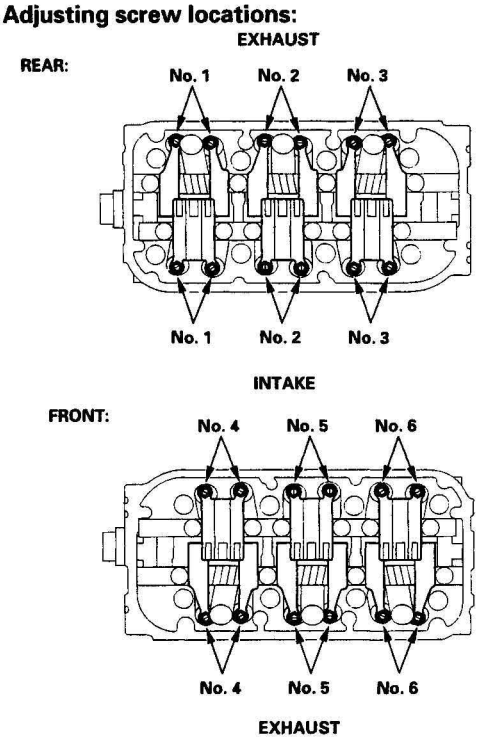
Valve Clearance Adjustment

1. Remove the cylinder head covers (see page 6-31).
2. Remove the front upper cover (see page 6-17).
3. Set the No. 1 piston at top dead center (TDC). Align the pointer (A) on the back cover with the No. 1 piston TDC mark (B) on the front camshaft pulley.

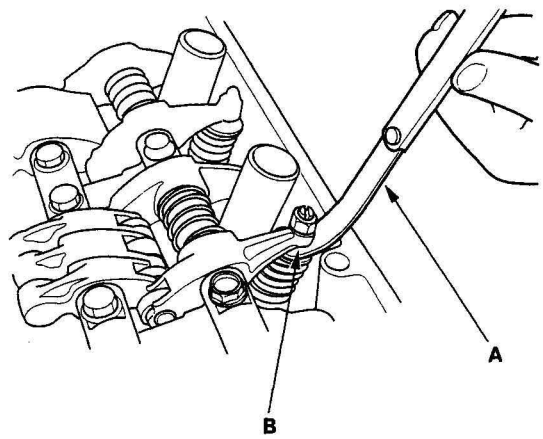


4. Select the correct thickness feeler gauge for the valves you're going to check.
   Intake: 0.20–0.24 mm (0.008–0.009 in.)
   Exhaust: 0.28–0.32 mm (0.011–0.013 in.)

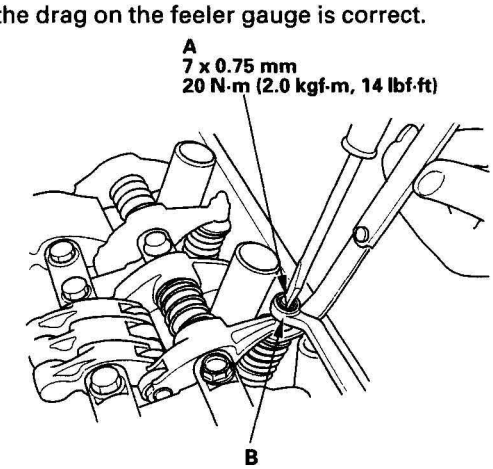
Adjusting screw locations:



5. Insert the feeler gauge (A) between the adjusting screw (B) and the end of the valve stem and slide it back and forth; you should feel a slight amount of drag.



6. If you feel too much or too little drag, loosen the locknut (A), and turn the adjusting screw (B) until the drag on the feeler gauge is correct.



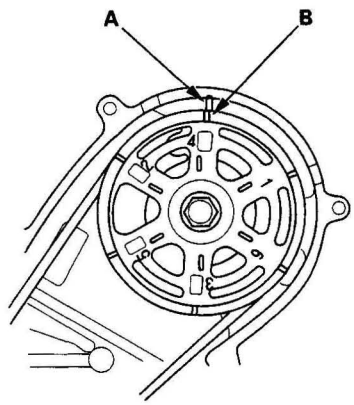
7. Tighten the locknut and recheck the clearance. Repeat the adjustment if necessary.

(cont'd)

Protected by AR

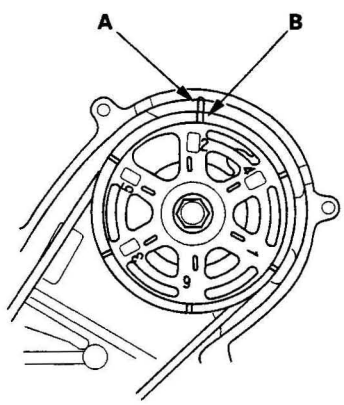
Valve Clearance Adjustment (cont'd)

8. Rotate the crankshaft clockwise. Align the pointer (A) on the back cover with the No. 4 piston TDC mark (B) on the front camshaft pulley.



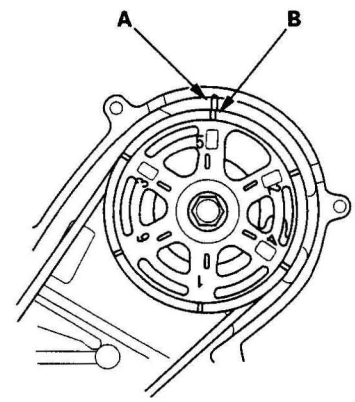
9. Check and, if necessary, adjust the valve clearance on No. 4 cylinder.

10. Rotate the crankshaft clockwise. Align the pointer (A) on the back cover with the No. 2 piston TDC mark (B) on the front camshaft pulley.



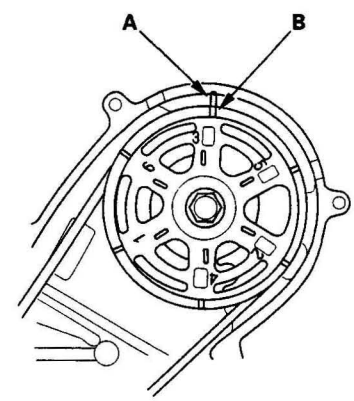
11. Check and, if necessary, adjust the valve clearance on No. 2 cylinder.

12. Rotate the crankshaft clockwise. Align the pointer (A) on the back cover with the No. 5 piston TDC mark (B) on the front camshaft pulley.



13. Check and, if necessary, adjust the valve clearance on No. 5 cylinder.

14. Rotate the crankshaft clockwise. Align the pointer (A) on the back cover with the No. 3 piston TDC mark (B) on the front camshaft pulley.

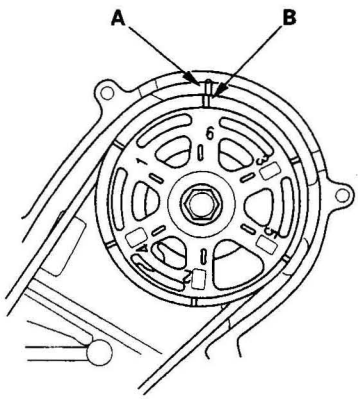


15. Check and, if necessary, adjust the valve clearance on No. 3 cylinder.

BACK

Protected by AR

16. Rotate the crankshaft clockwise. Align the pointer (A) on the back cover with the No. 6 piston TDC mark (B) on the front camshaft pulley.



17. Check and, if necessary, adjust the valve clearance on No. 6 cylinder.

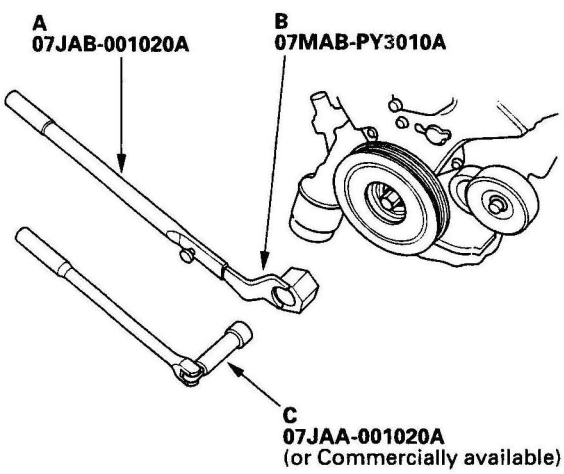
Protected by AR

Crankshaft Pulley Removal and Installation

Special Tools Required
- Holder Handle 07JAB-001020A
- Holder Attachment, 50 mm, Offset 07MAB-PY3010A
- Socket, 19 mm 07JAA-001020A
  or a commercially available 19 mm socket

Removal

1. Hold the pulley with the holder handle (A) and holder attachment (B).

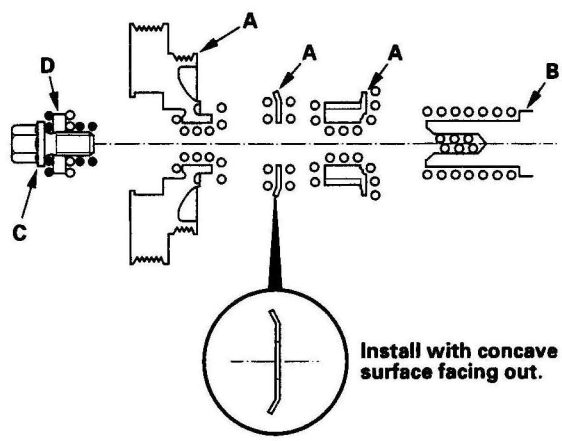


2. Remove the bolt with a heavy duty 19 mm socket (C) and breaker bar.

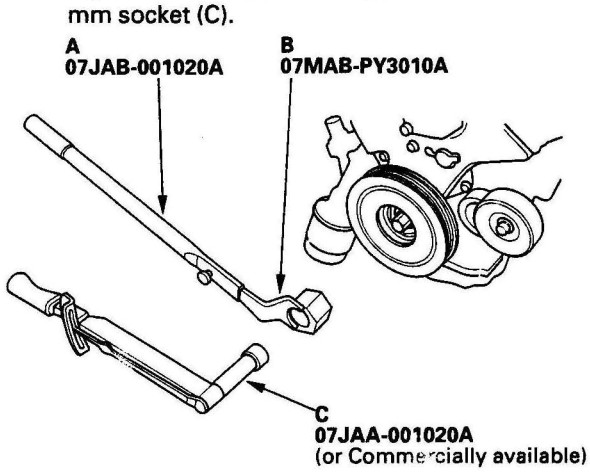
Installation

1. Remove any oil from the pulleys (A), crankshaft (B), bolt (C) and washer (D). Clean and lubricate the points shown below.

○ : Clean
● : Lubricate



2. Install the crankshaft pulley, and tighten the bolt to 245 N·m (25.0 kgf·m, 181 lbf·ft). Do not use an impact wrench.
   –1 Hold the pulley with the holder handle (A) and holder attachment (B).
   –2 Tighten the bolt with a torque wrench and 19 mm socket (C).

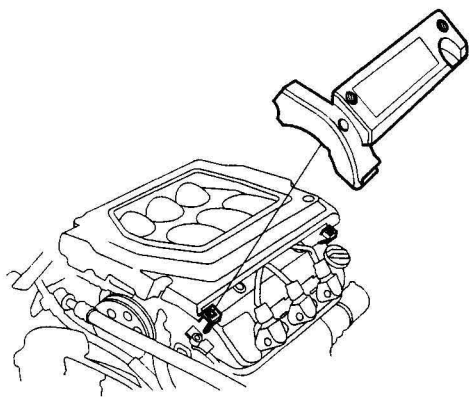


BACK

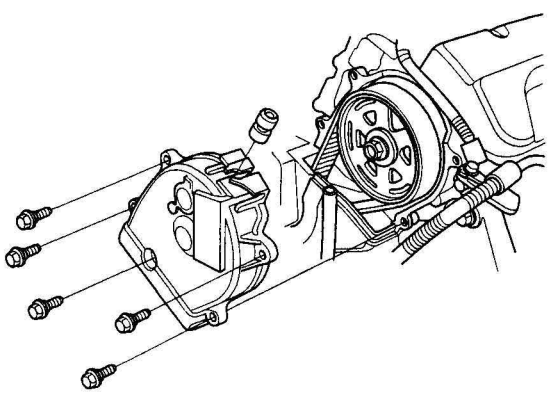
Protected by AR

Timing Belt Inspection

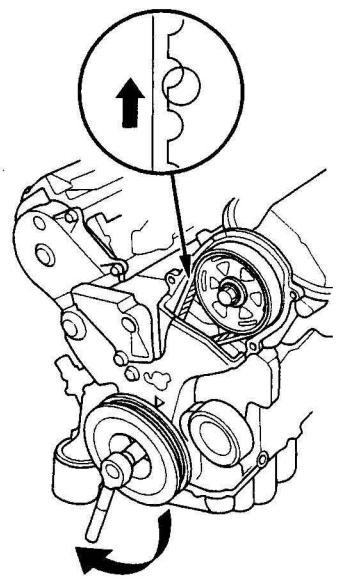
1. Remove the ignition coil cover.



2. Remove the front upper cover.



3. Inspect the timing belt for cracks and oil or coolant soaking. Replace the belt if it is oil or coolant soaked. Remove any oil or solvent that gets on the belt.

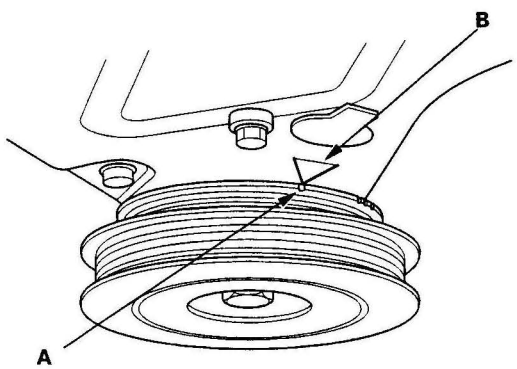


Protected by AR

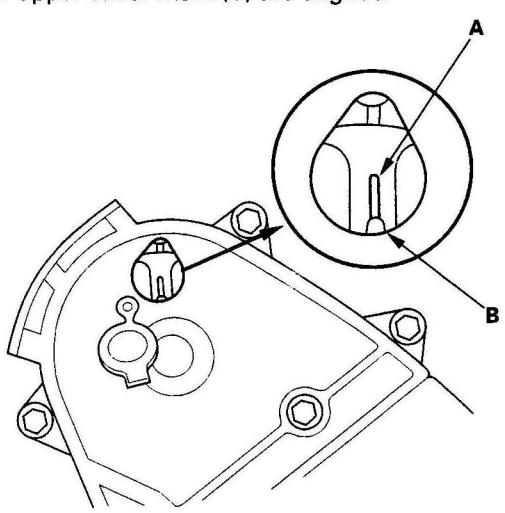
Timing Belt Removal

Special Tools Required
- Holder Handle 07JAB-001020A
- Holder Attachment, 50 mm, Offset 07MAB-PY3010A
- Socket, 19 mm 07JAA-001020A
  or a commercially available 19 mm socket

1. Turn the crankshaft so its white mark (A) lines up with the pointer (B).

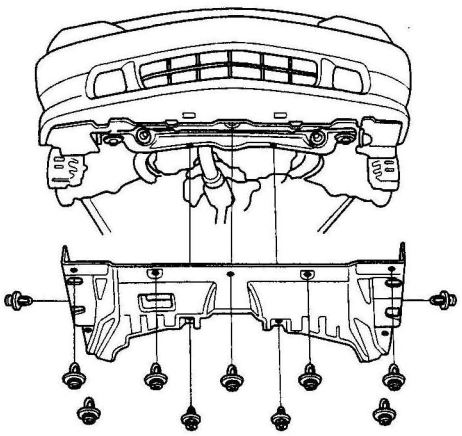


2. Check that the rear camshaft pulley mark (A) and rear upper cover mark (B) are aligned.

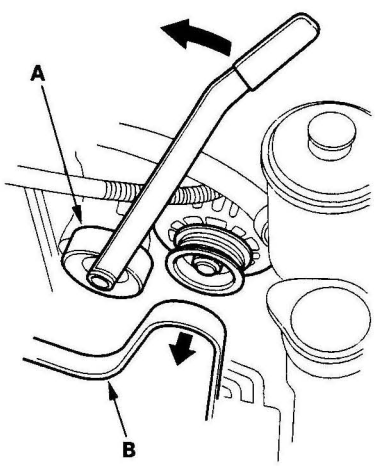


3. Remove the front tires/wheels.

4. Remove the splash shield.



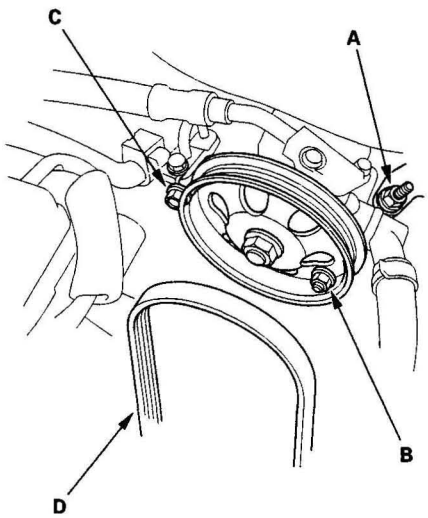
5. Move the auto-tensioner (A) to remove tension from the alternator belt (B), then remove the alternator belt.



BACK

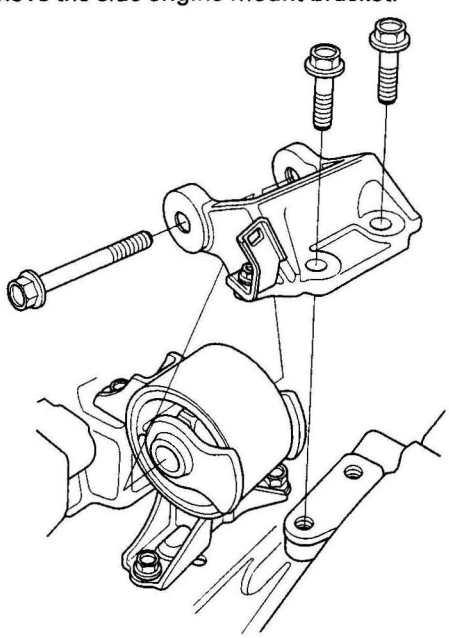
Protected by AR

6. Loosen the adjusting nut (A), locknut (B) and mounting bolt (C), then remove the power steering (P/S) pump belt (D).

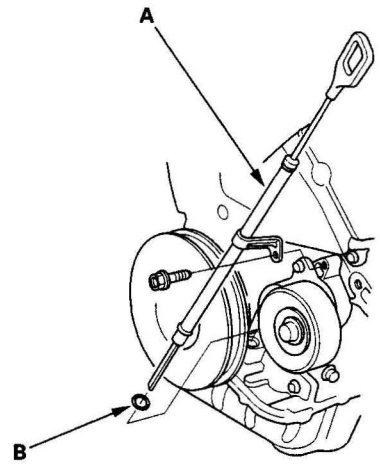


7. Support the engine with a jack and wood block under the oil pan.

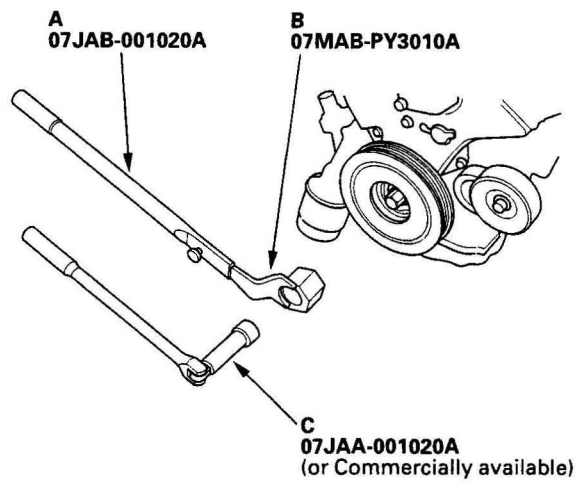
8. Remove the side engine mount bracket.



9. Remove the dipstick and tube (A); Discard the O-ring (B).



10. Hold the pulley with the holder handle (A) and holder attachment (B).



11. Remove the bolt with a heavy duty 19 mm socket (C) and breaker bar.

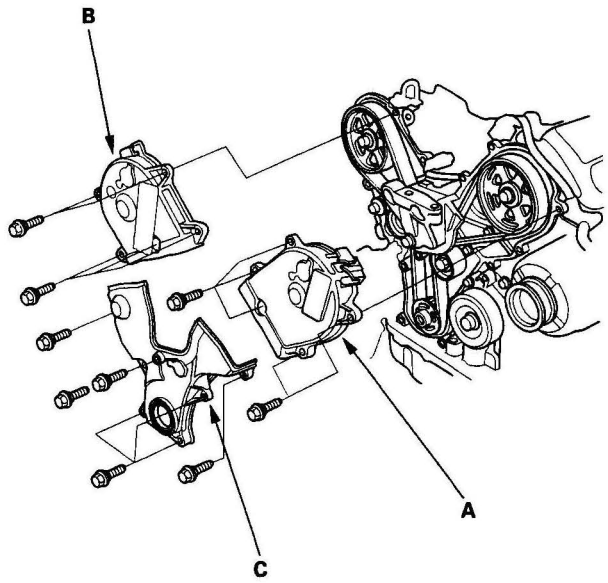
(cont'd)

BACK

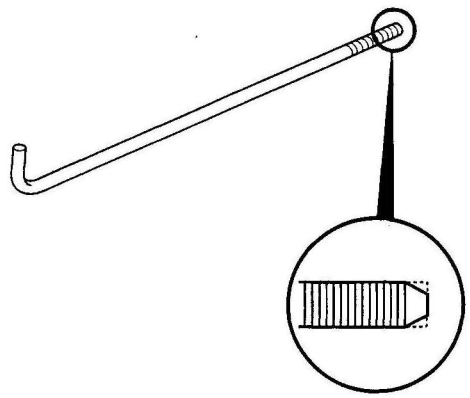
Protected by AR

Timing Belt Removal (cont'd)

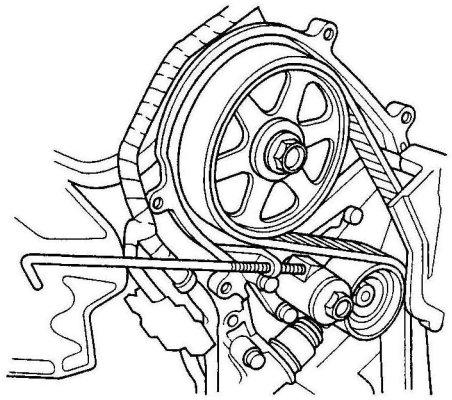
12. Remove the front upper cover (A), rear upper cover (B) and lower cover (C).



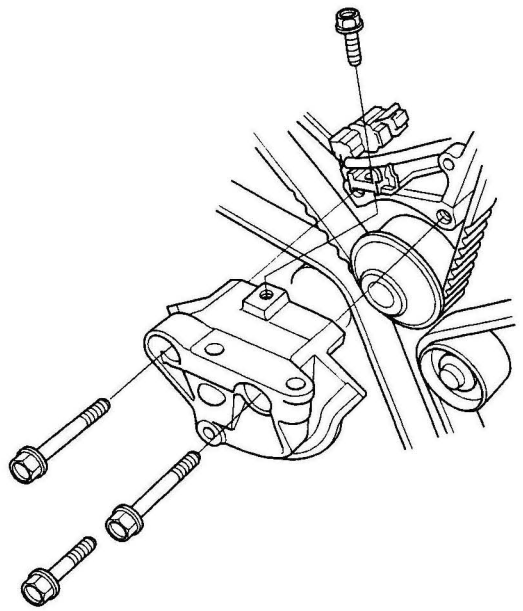
13. Remove one of the battery clamp bolts from the battery tray, and grind the end of it as shown.



14. Screw the battery clamp bolt in as shown to hold the timing belt adjuster in its current position. Tighten it by hand, do not use a wrench.



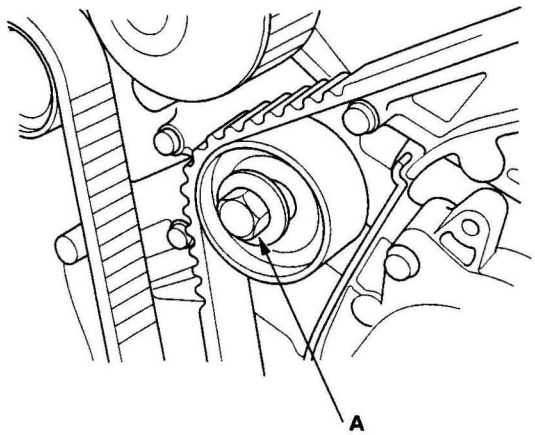
15. Remove the engine mount bracket.



BACK

Protected by AR

16. Loosen the idler pulley bolt (A) about five or six turns, then remove the timing belt.



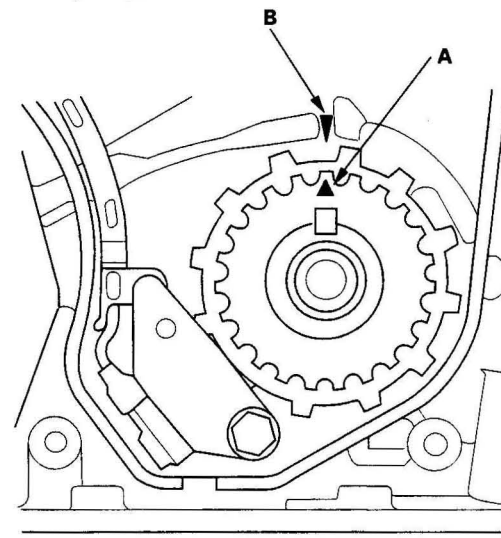
Timing Belt Installation

NOTE: The following procedure is for installing a new timing belt. If you are installing a used timing belt, refer to the next procedure.

New Belt

1. Clean the timing belt pulleys, and upper and lower covers.

2. Set the timing belt drive pulley to top dead center (TDC) by aligning the TDC mark (A) on the tooth of the timing belt drive pulley with the pointer (B) on the oil pump.



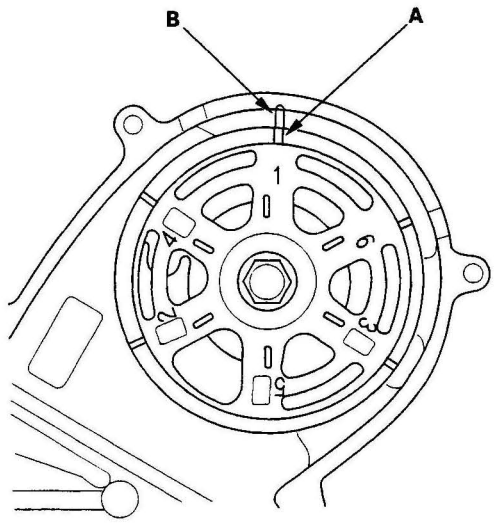
(cont'd)

Protected by AR

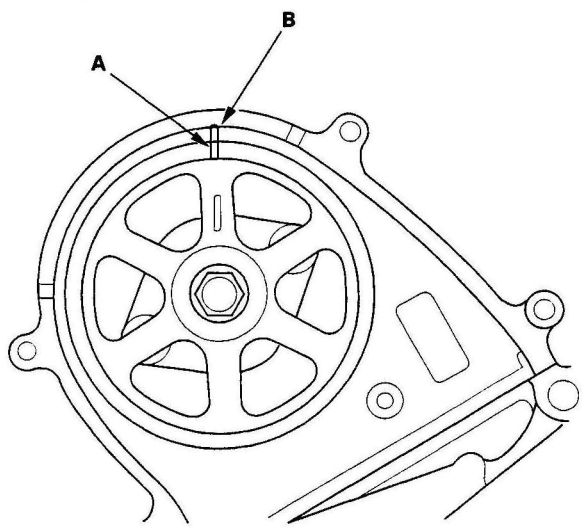
Timing Belt Installation (cont'd)

3. Clean the camshaft pulleys. Set the camshaft pulleys to TDC by aligning the TDC marks (A) on the camshaft pulleys with the pointers (B) on the back covers.

FRONT:

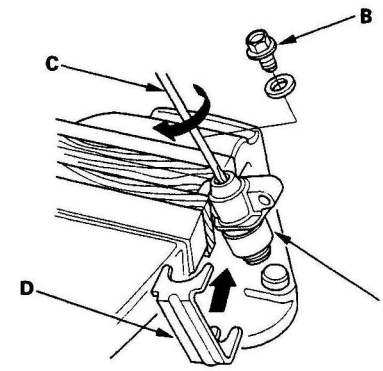


REAR:



4. Remove the battery clamp bolt from the back cover.
5. Remove the auto-tensioner.
6. Hold the auto-tensioner (A) with the maintenance bolt pointing up. Loosen and remove the maintenance bolt (B) ('99 model).

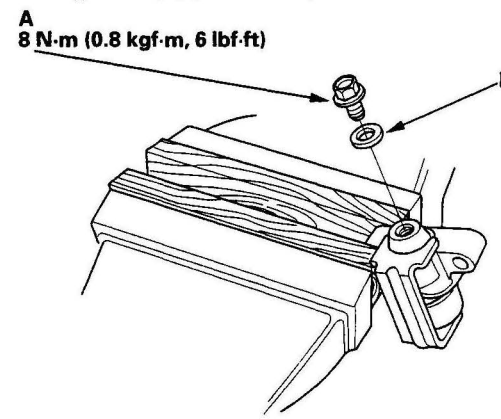
   NOTE: Handle the auto-tensioner carefully so the oil inside does not spill or leak. If any of the oil has spilled or leaked out of the auto-tensioner, refill it with 5W-30 motor oil. The total capacity is 6.5 mℓ (0.22 fl oz).



7. Clamp the boss of the auto-tensioner in a soft-jawed vise. Do not grip the housing of the auto-tensioner ('99 model).
8. Insert a flat blade screwdriver (C) into the maintenance hole. Place the retainer (D) (P/N 14540-P8A-A01) on the auto-tensioner while turning the screwdriver clockwise to compress the bottom ('99 model).

   NOTE: Take care not to damage the threads or the gasket contact surface with the screwdriver.

9. Reinstall the maintenance bolt (A). Always use a new gasket (B) ('99 model).

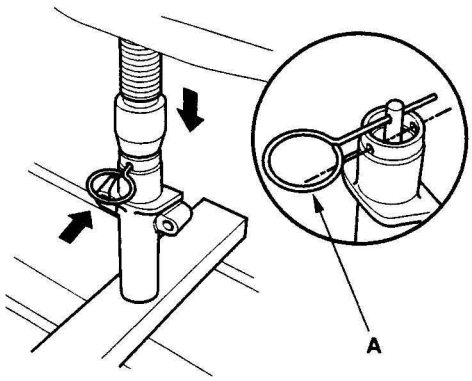


10. Make sure no oil is leaking around the maintenance bolt.

BACK

Protected by AR

11. Align the holes on the rod and housing of the auto-tensioner with a pin (A)('00-03 models).



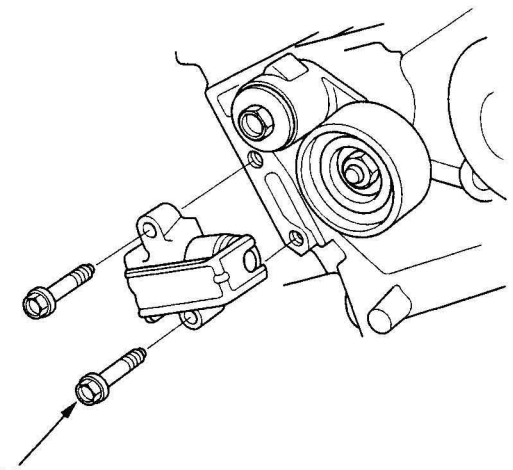
12. Set the auto-tensioner on the hydraulic press, then slowly compress the auto-tensioner. Insert a pin of 2.0 mm (0.08 in.) diameter through the housing and the rod ('00-03 models).

NOTE: The compression pressure should not exceed 9,800 N (1,000 kgf, 2,200lbf).

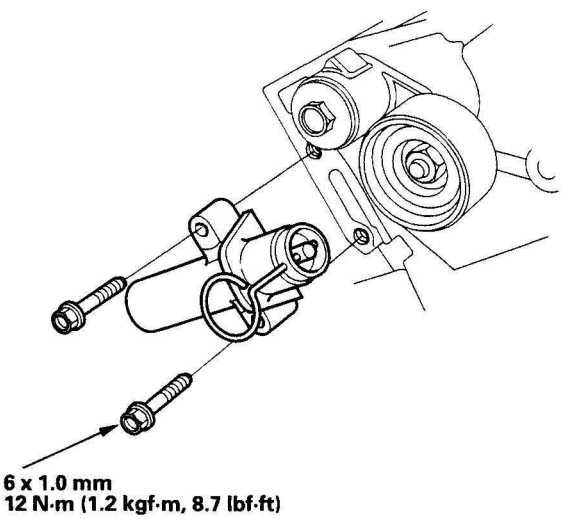
13. Install the auto-tensioner.

NOTE: Make sure the retainer or pin stays in place.

'99 model:



'00-03 models:



(cont'd)

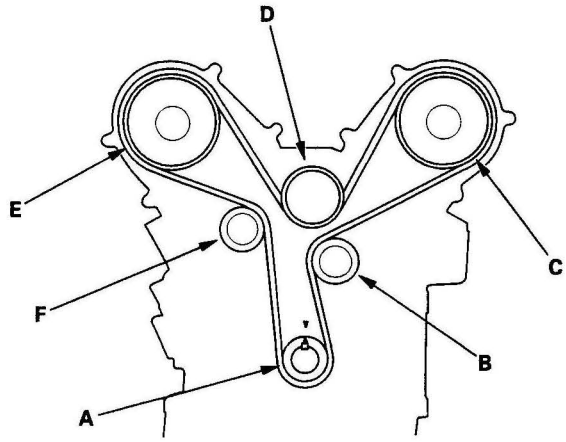
BACK

Protected by AR

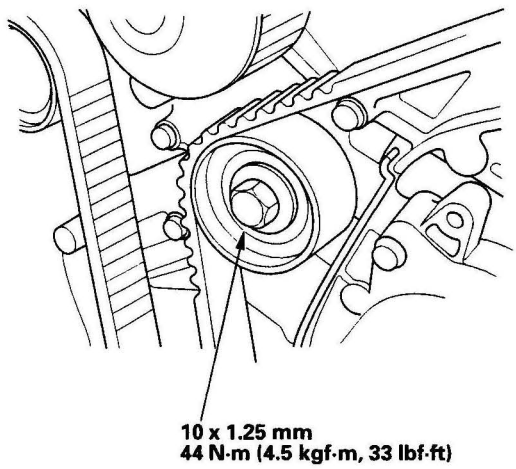
Timing Belt Installation (cont'd)

14. Install the timing belt in a counter clockwise sequence starting with the drive pulley.

    –1 Drive pulley (A).
    –2 Idler pulley (B).
    –3 Front camshaft pulley (C).
    –4 Water pump pulley (D).
    –5 Rear camshaft pulley (E).
    –6 Adjusting pulley (F).

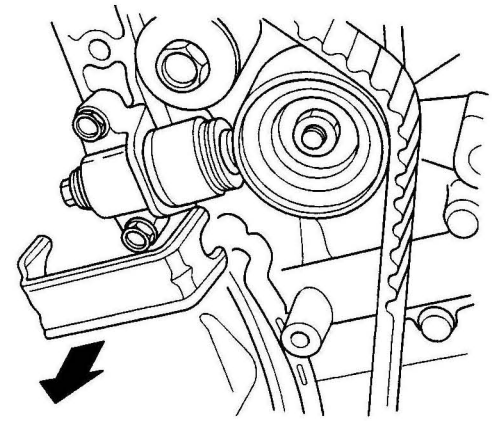


15. Tighten the idler pulley bolt.

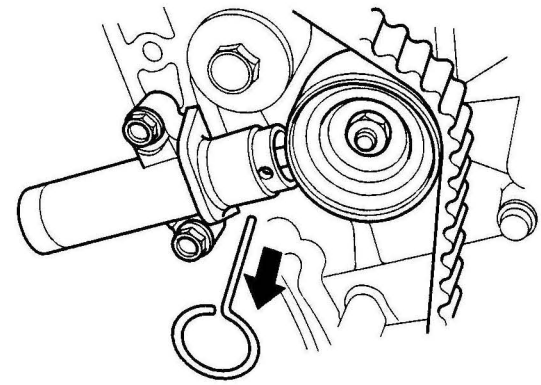


16. Remove the retainer or pin from the auto-tensioner.

'99 model:



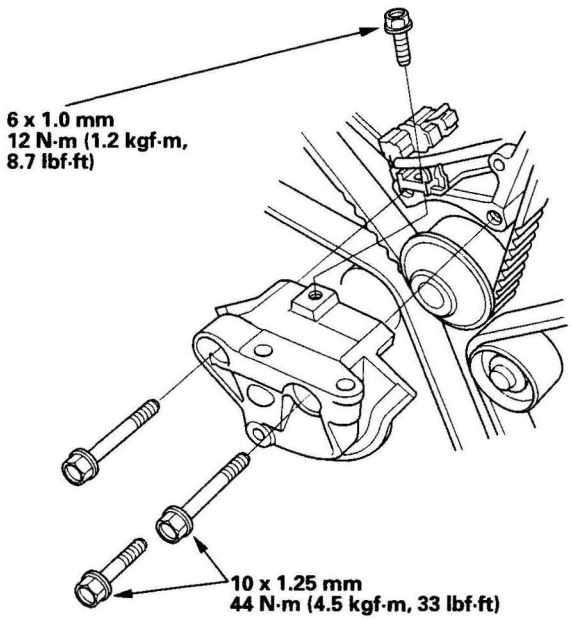
'00-03 models:



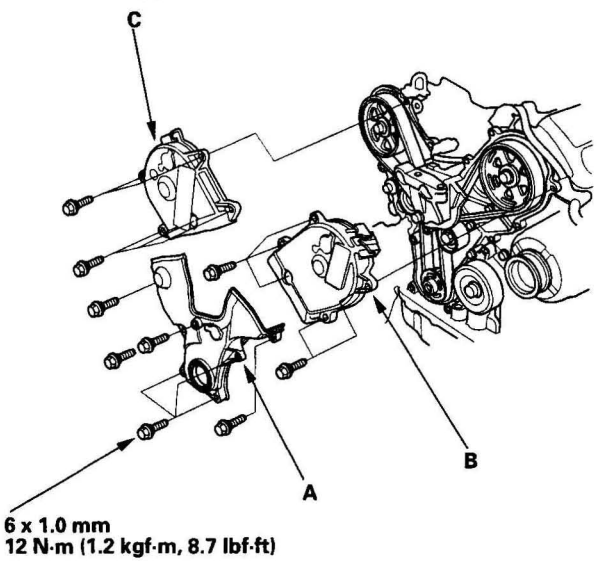
BACK

Protected by AR

17. Install the engine mount bracket.

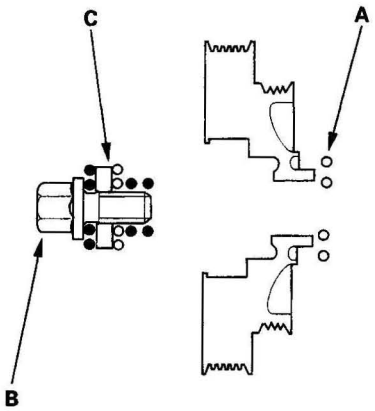


18. Install the lower cover (A), front upper cover (B) and rear upper cover (C).



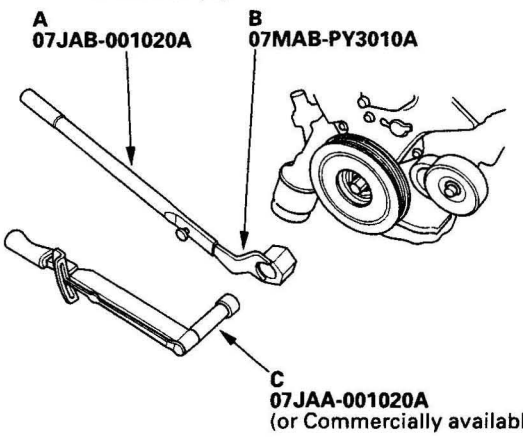
19. Clean the crankshaft pulley bolt and washer.

20. Clean all oil off the inside face (A) of the crankshaft pulley, and apply lubricant to the pulley bolt (B) and washer (C).



21. Install the crankshaft pulley, and tighten the bolt to 245 N·m (25.0 kgf·m, 181 lbf·ft). Do not use an impact wrench.

-1 Hold the pulley with holder handle (A) and holder attachment (B).
-2 Tighten the bolt with a torque wrench and 19 mm socket (C).



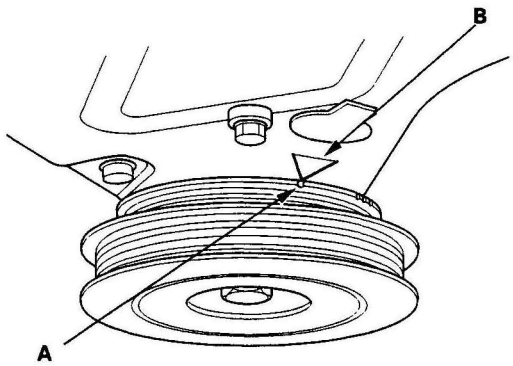
22. Rotate the crankshaft pulley about five or six turns clockwise so the timing belt positions on the pulleys.

(cont'd)

Protected by AR

Timing Belt Installation (cont'd)

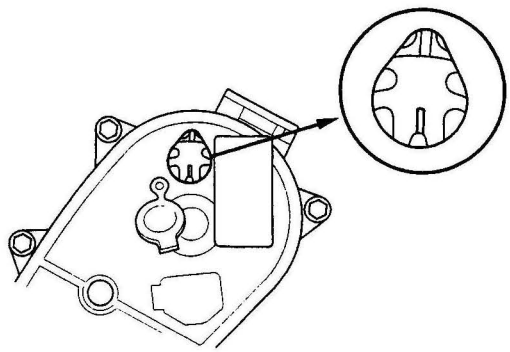
23. Turn the crankshaft pulley so its white mark (A) lines up with the pointer (B).



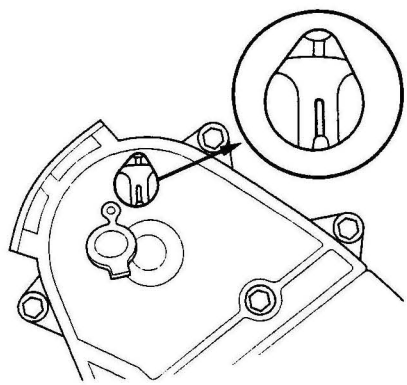
24. Check the camshaft pulley marks.

- If the camshaft pulley marks are at TDC, go to step 25.
- If the camshaft pulley marks are not at TDC, remove the timing belt and repeat steps 2 through 21.

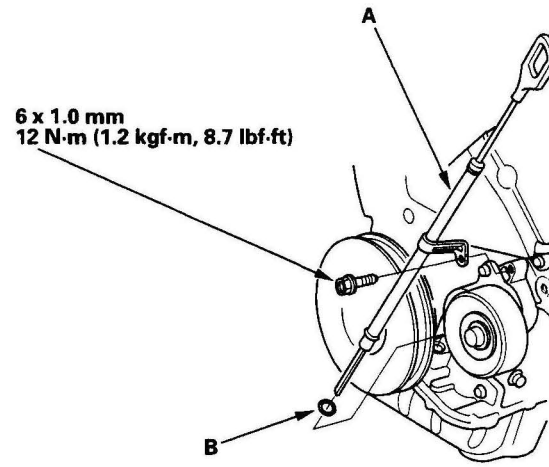
FRONT CAMSHAFT PULLEY:



REAR CAMSHAFT PULLEY:



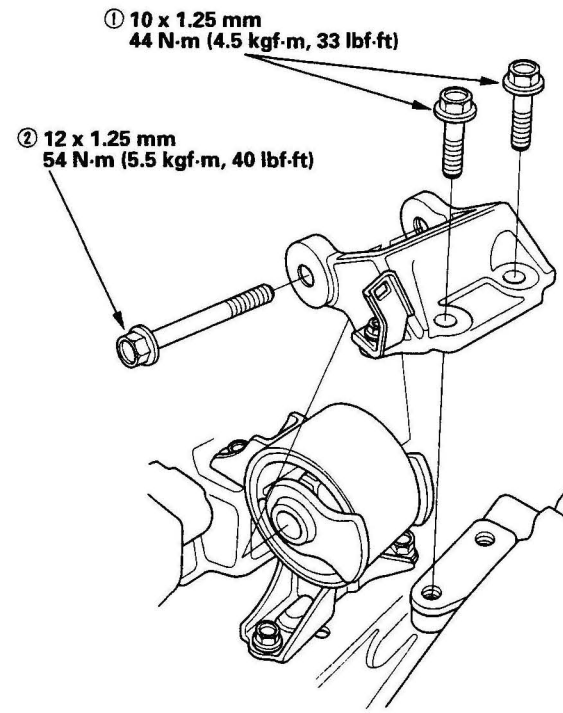
25. Install the dipstick and tube (A) with a new O-ring (B).



26. Install and adjust the P/S pump belt (see page 17-14).

27. Install the alternator belt.

28. Install the side engine mount bracket, then tighten the mounting bolts in the numbered sequence shown.



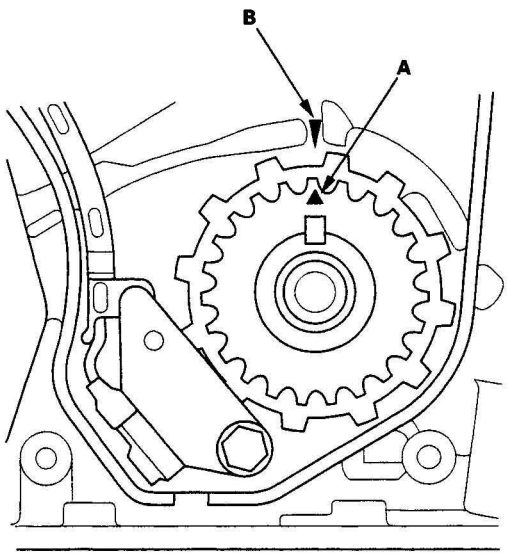
BACK

Protected by AR

Used Belt

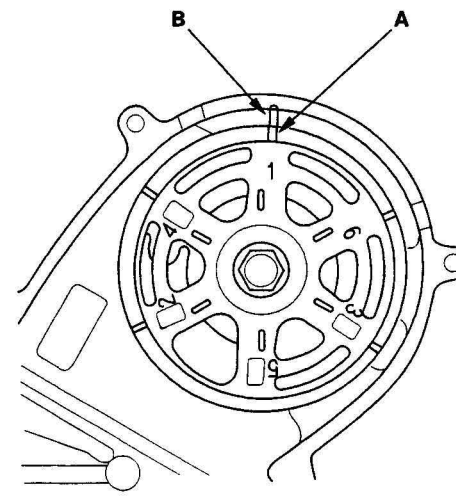
Follow this procedure when installing a used timing belt.

1. Clean the timing belt pulleys, and upper and lower covers.
2. Set the timing belt drive pulley to TDC by aligning the TDC mark (A) on the tooth of the timing belt drive pulley with the pointer (B) on the oil pump.

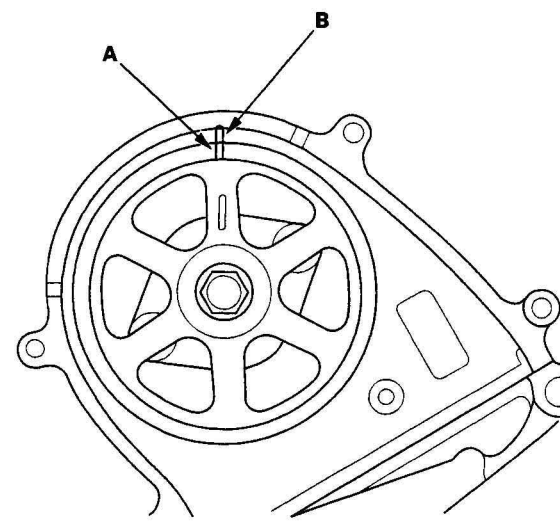


3. Clean the camshaft pulleys. Set the camshaft pulleys to TDC by aligning the TDC marks (A) on the camshaft pulleys with the pointers (B) on the back covers.

FRONT:



REAR:



(cont'd)

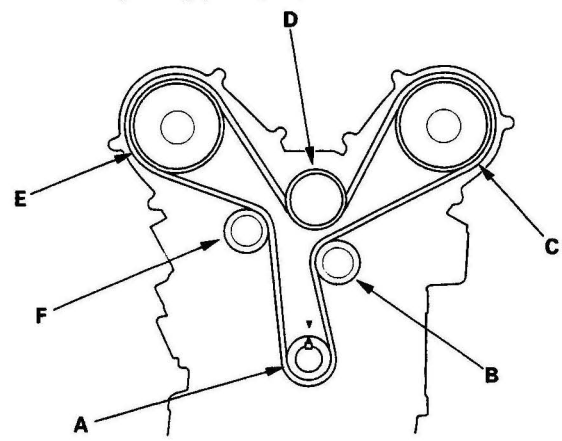
Protected by AR

Timing Belt Installation (cont'd)

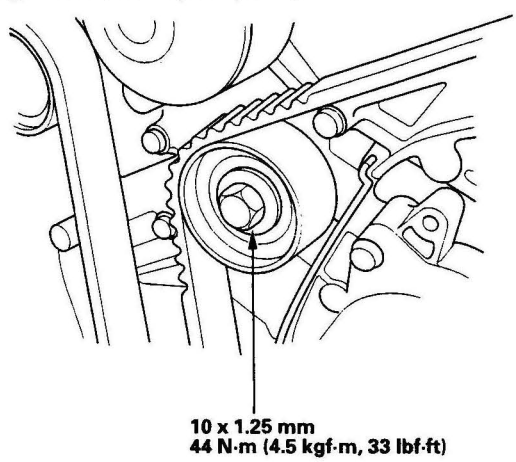
4. If the auto-tensioner has extended and the timing belt cannot be installed, remove and compress the auto-tensioner.

5. Install the timing belt in a counterclockwise sequence starting with the drive pulley. Take care not to damage the timing belt when installing it.

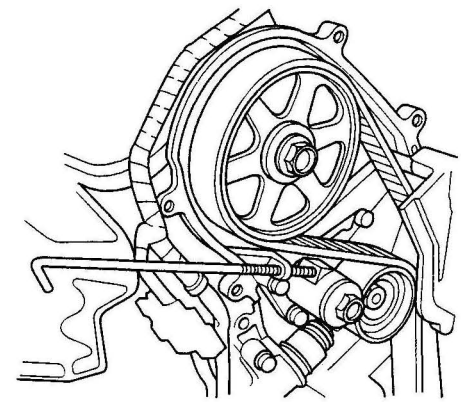
   -1 Drive pulley (A).
   -2 Idler pulley (B).
   -3 Front camshaft pulley (C).
   -4 Water pump pulley (D).
   -5 Rear camshaft pulley (E).
   -6 Adjusting pulley (F).



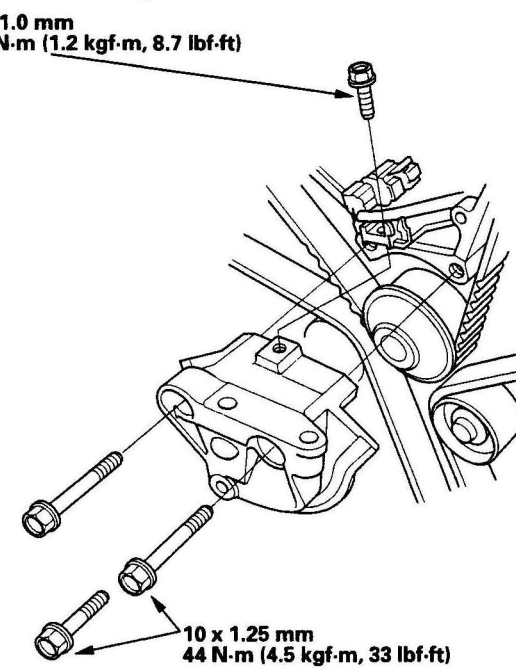
6. Tighten the idler pulley bolt.



7. Remove the battery clamp bolt from the back cover.



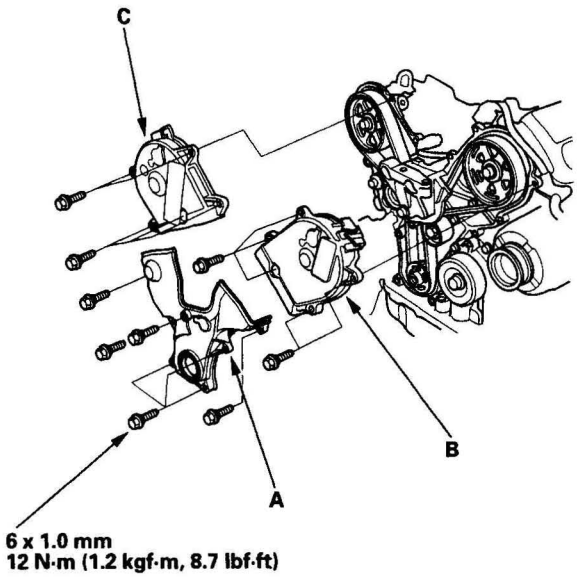
8. Install the engine mount bracket.



BACK

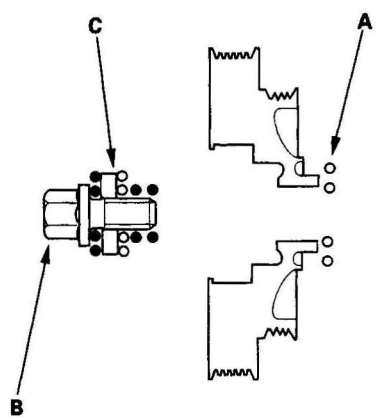
Protected by AR

9. Install the lower cover (A), front upper cover (B) and rear upper cover (C).



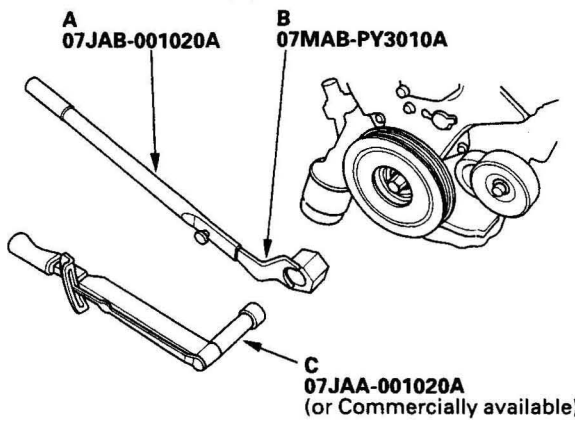
10. Clean the crankshaft pulley bolt and washer.

11. Clean any oil off the inside face (A) of the crankshaft pulley, and apply lubricant to the pulley bolt (B) and washer (C).



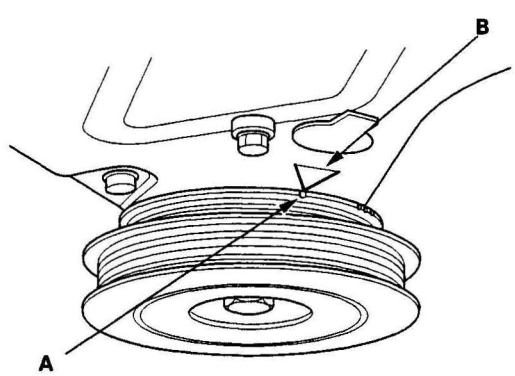
12. Install the crankshaft pulley, and tighten the bolt to 245 N·m (25.0 kgf·m, 181 lbf·ft). Do not use an impact wrench.

   –1 Hold the pulley with the holder handle (A) and holder attachment (B).
   –2 Tighten the bolt with a torque wrench and 19 mm socket (C).



13. Rotate the crankshaft pulley about five or six turns clockwise so the timing belt positions on the pulleys.

14. Turn the crankshaft pulley so its white mark (A) lines up with the pointer (B).



(cont'd)

BACK

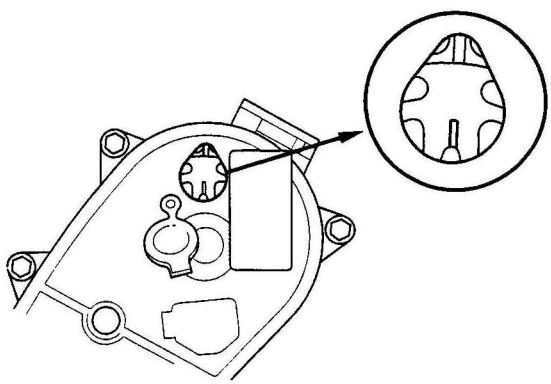
Protected by AR

Timing Belt Installation (cont'd)

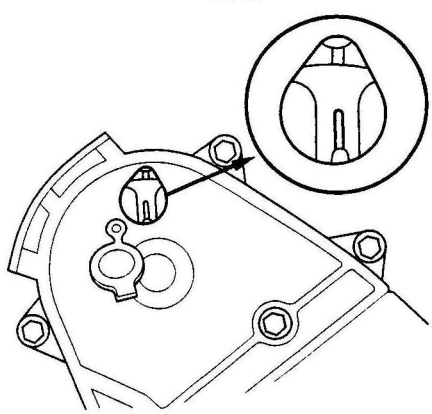
15. Check the camshaft pulley marks.

    - If the camshaft pulley marks are at TDC, go to step 16.
    - If the camshaft pulley marks are not at TDC, remove the timing belt and repeat steps 2 through 11.

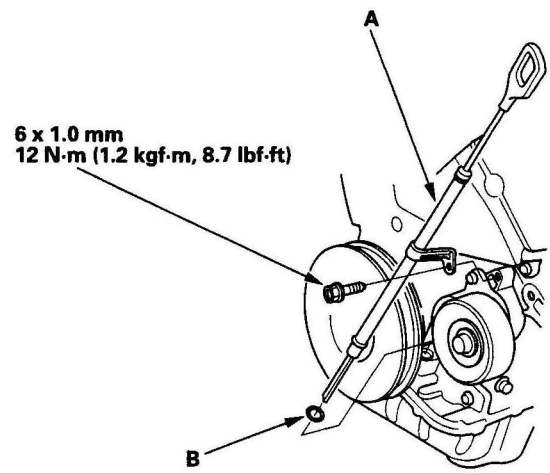
FRONT CAMSHAFT PULLEY:



REAR CAMSHAFT PULLEY:



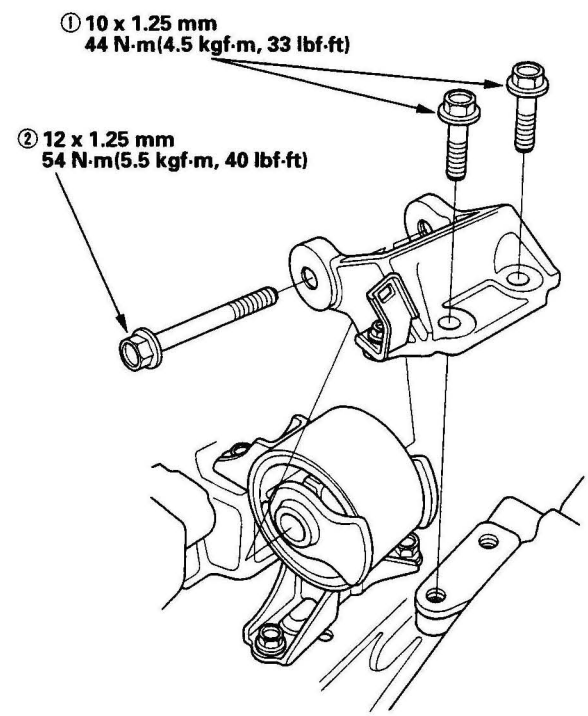
16. Install the dipstick and tube (A) with a new O-ring (B).



17. Install and adjust the P/S pump belt (see page 17-14).

18. Install the alternator belt.

19. Install the side engine mount bracket, then tighten the mounting bolts in the numbered sequence shown.

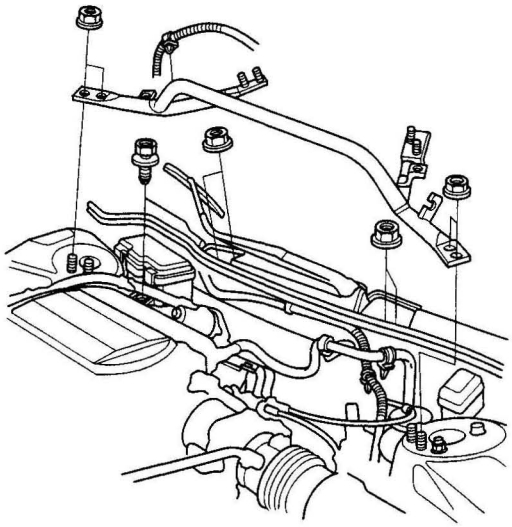


BACK

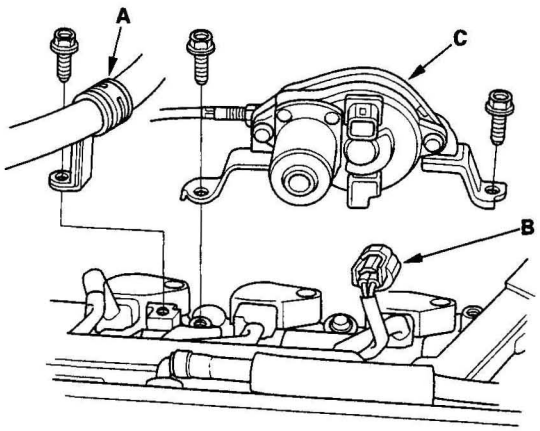
Protected by AR

Cylinder Head Cover Removal

1. Remove the strut brace.

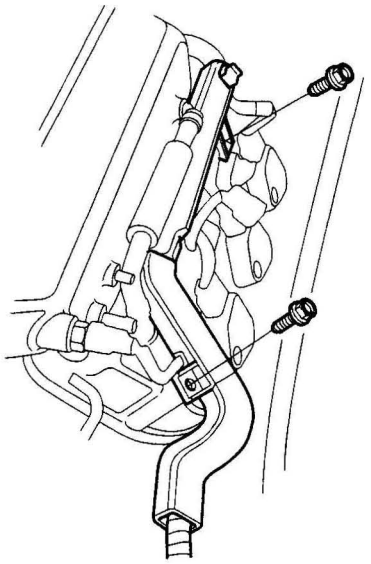


2. Remove the power steering (P/S) hose clamp (A).

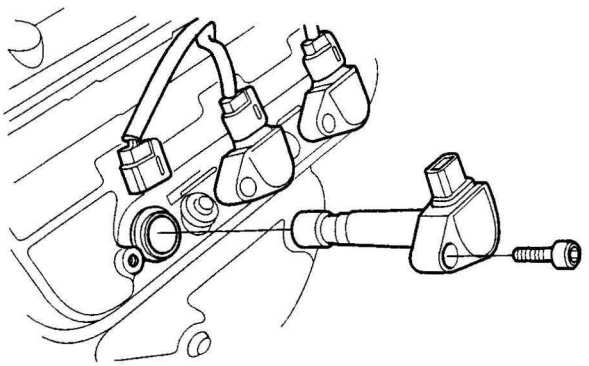


3. Disconnect the intake manifold runner control (IMRC) actuator connector (B), then remove the IMRC actuator (C) (J32A2 engine).

4. Remove the two bolts securing the wire harness holder (J32A2 engine).



5. Remove the six ignition coils from the front and rear cylinder head.



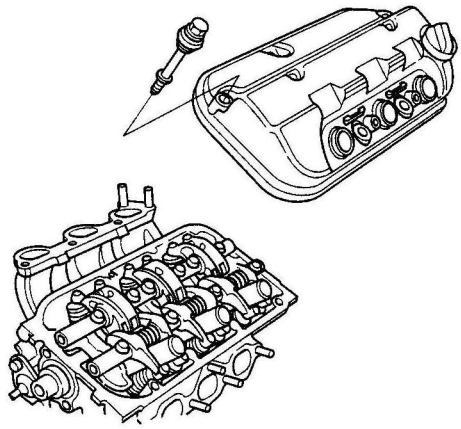
(cont'd)

Protected by AR

Cylinder Head Cover Removal (cont'd)

6. Remove the intake manifold (see page 9-5).

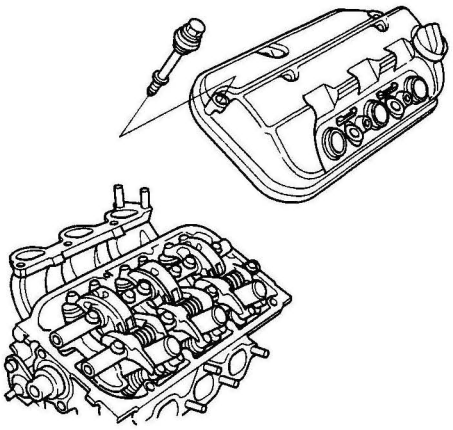
7. Remove the cylinder head cover.



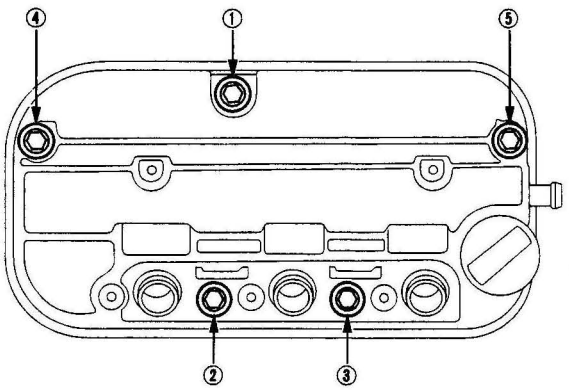
Cylinder Head Cover Installation

1. Install the cylinder head covers.

NOTE:
- Before installing the cylinder head cover, clean the cylinder head contacting surfaces with a shop towel.
- Take care not to damage the spark plug seal when installing the cylinder head cover.
- Visually check the spark plug seals for damage.
- Replace the washer if it is damaged or deteriorated.



2. Tighten the nuts in two or three steps. In the final step, tighten all nuts, in sequence, to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).

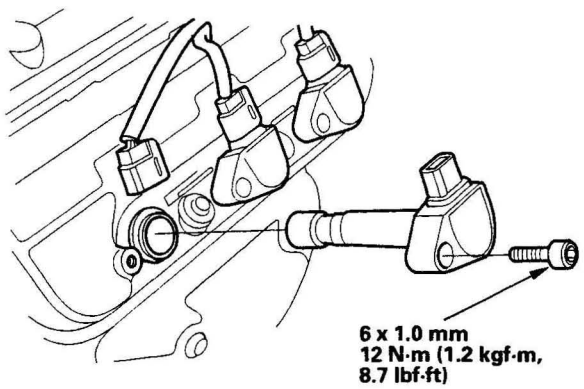


BACK

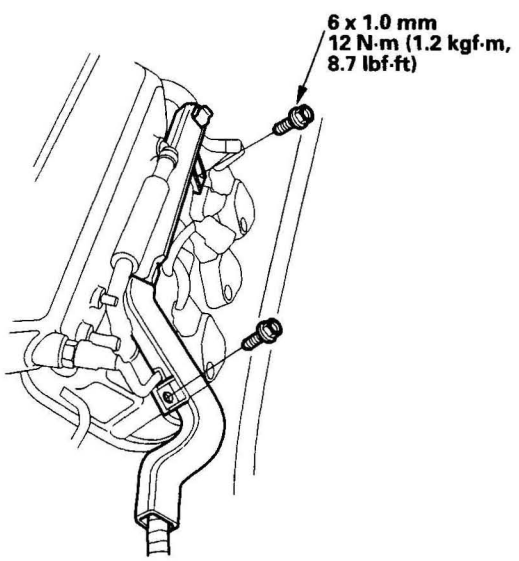
Protected by AR

3. Install the intake manifold (see page 9-8).

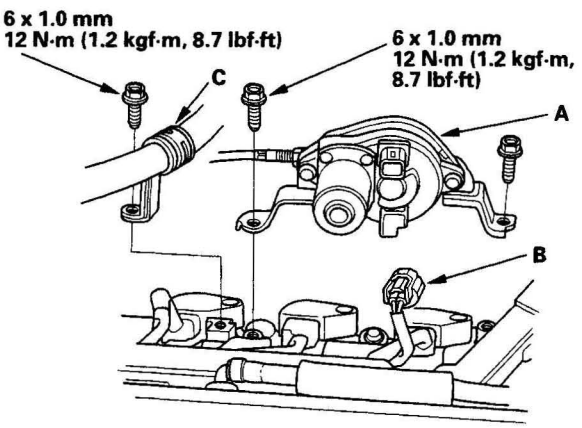
4. Install the six ignition coils.



5. Install the wire harness holder, then secure the bolts (J32A2 engine).

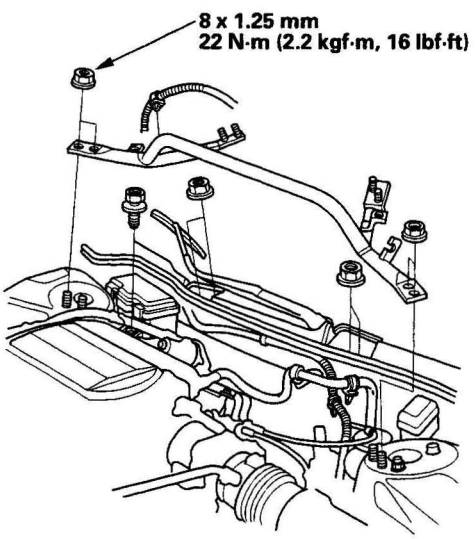


6. Install the intake manifold runner control (IMRC) actuator (A), then connect the IMRC actuator connector (B) (J32A2 engine).



7. Install the power steering (P/S) hose clamp (C).

8. Install the strut brace.



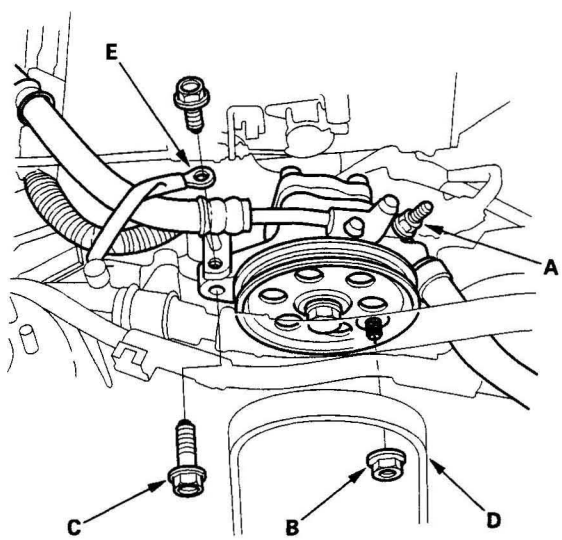
BACK

Protected by AR

Cylinder Head Removal

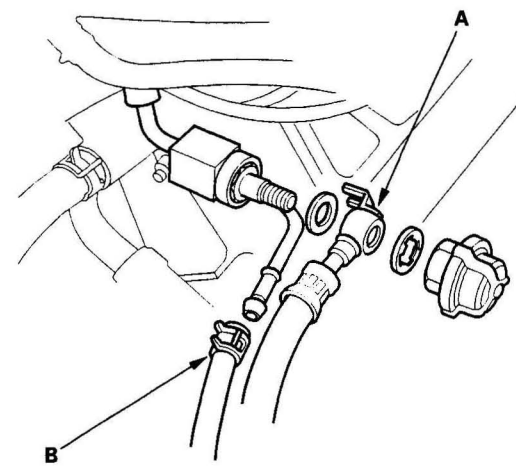
NOTE:
- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 100°F (38°C) before loosening the cylinder head bolts.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Drain the engine coolant (see page 10-13).
4. Remove the alternator belt (see page 4-23).
5. Loosen the adjusting nut (A), and remove the locknut (B) and mounting bolt (C), then remove the power steering (P/S) pump belt (D) and pump without disconnecting the P/S hoses.

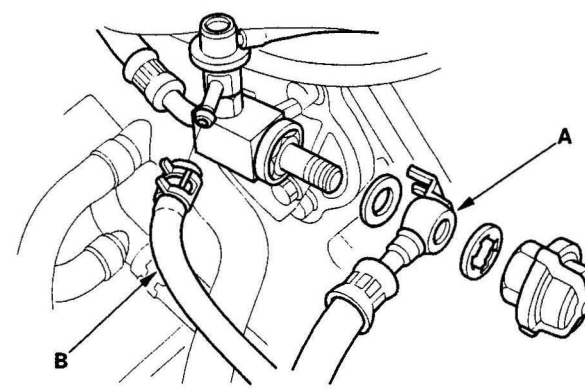


6. Remove the ground cable (E) ('00-03 models).
7. Remove the alternator (see page 4-23).
8. Relieve fuel pressure (see page 11-163).
9. Remove the fuel feed hose (A) and fuel return hose (B).

'99 model:



'00-03 models:



BACK

Protected by AR

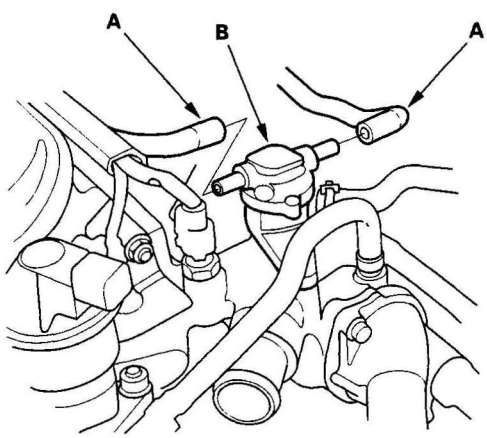
10. Remove the intake manifold (see page 9-5).

11. Remove the timing belt (see page 6-18).

12. Remove the engine wire harness connectors and wire harness clamps from the cylinder head.

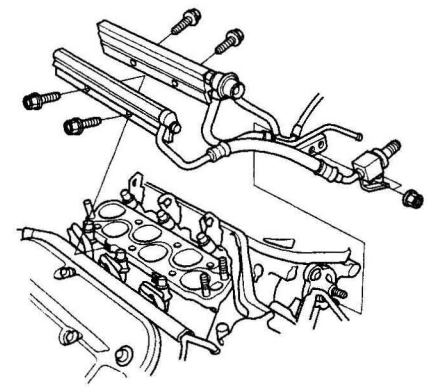
    - Six injector connectors
    - Engine coolant temperature (ECT) sensor connector
    - Radiator fan switch A connector
    - Radiator fan switch B connector
    - Coolant temperature gauge sending unit connector ('99 model)
    - Crankshaft position (CKP) sensor connector
    - Camshaft position (CMP) (top dead center (TDC)) sensor connector
    - Exhaust gas recirculation (EGR) valve connector
    - VTEC solenoid valve connector
    - VTEC oil pressure switch connector
    - Oil pressure switch connector

13. Remove the vacuum hoses (A) from the intake air bypass control valve (B).

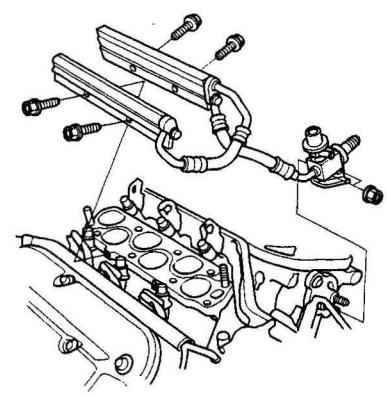


14. Remove the fuel rails.

'99 model:



'00-03 models:



(cont'd)

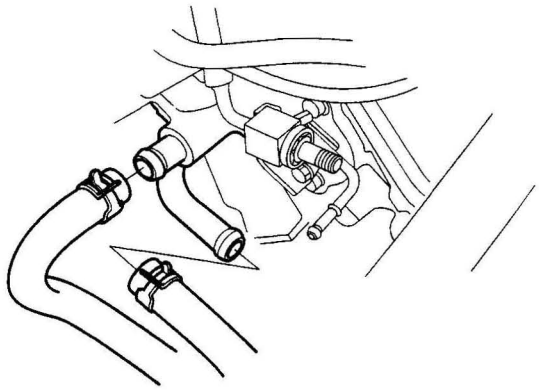
BACK

Protected by AR

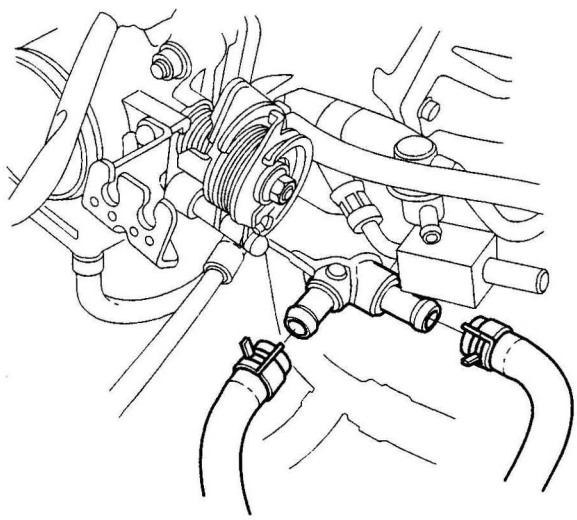
Cylinder Head Removal (cont'd)

15. Remove the heater hoses.

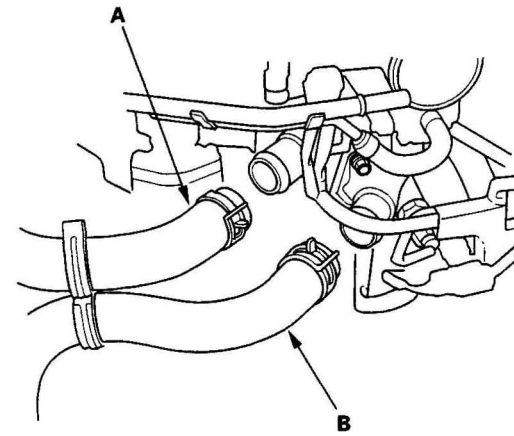
'99 model:



'00-03 models:

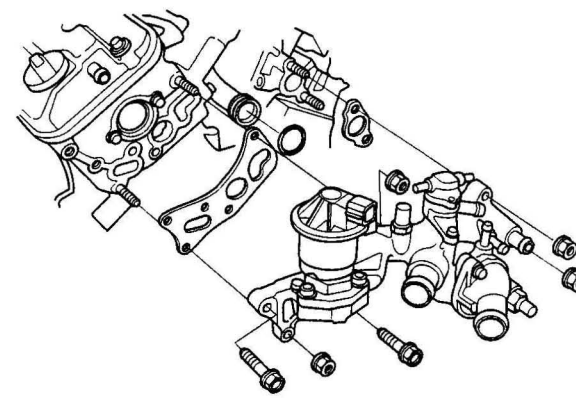


16. Remove the upper radiator hose (A) and lower radiator hose (B).



17. Remove the front and rear exhaust manifolds (see page 9-11).

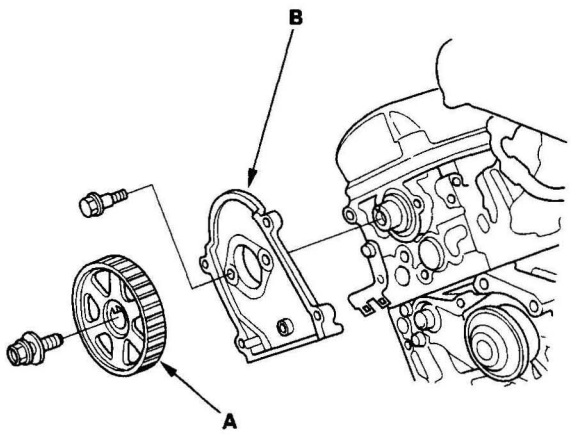
18. Remove the water passage.



BACK

Protected by AR

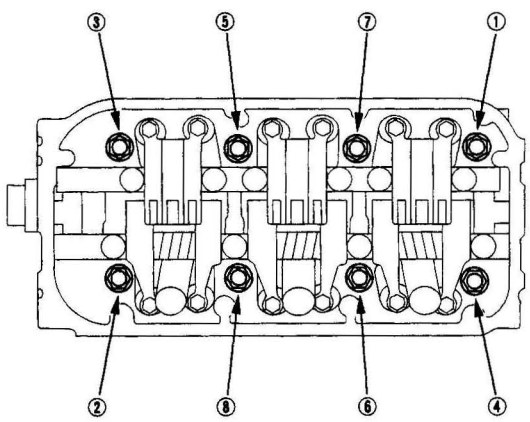
19. Remove the camshaft pulleys (A) and back covers (B).



20. Remove the cylinder head covers.

21. Remove the cylinder head bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

CYLINDER HEAD BOLT LOOSENING SEQUENCE:



22. Remove the cylinder heads.

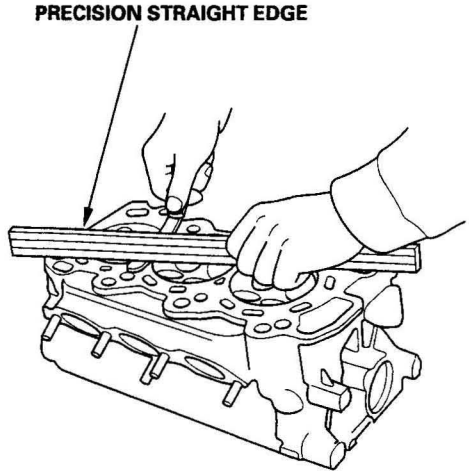
Protected by AR

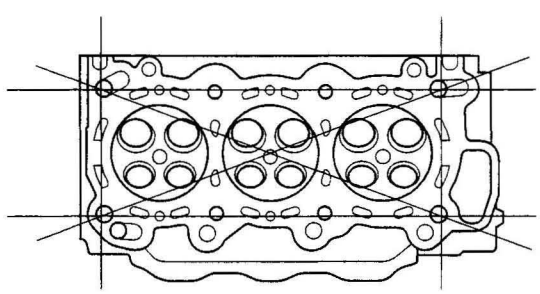
Cylinder Head Inspection for Warpage

1. Remove the cylinder head (see page 6-34).
2. Inspect the camshaft (see page 6-42).
3. Check the cylinder head for warpage.
   Measure along edges, and three ways across the center.
   - If warpage is less than 0.05 mm (0.002 in.), cylinder head resurfacing is not required.
   - If warpage is between 0.05 mm (0.002 in.) and 0.2 mm (0.008 in.), resurface the cylinder head.
   - Maximum resurface limit is 0.2 mm (0.008 in.) based on a height of 121 mm (4.76 in.).

Cylinder Head Height:
Standard (New): 120.95 – 121.05 mm (4.762 – 4.766 in.)

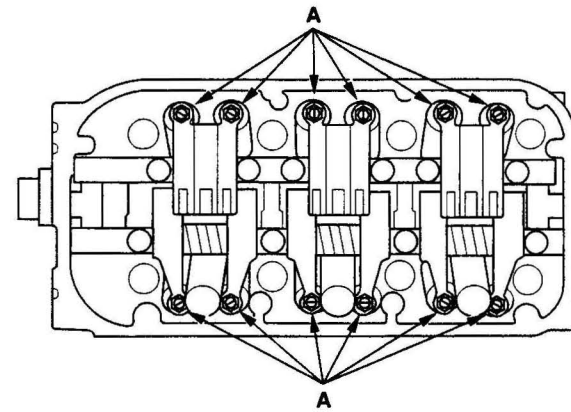
PRECISION STRAIGHT EDGE





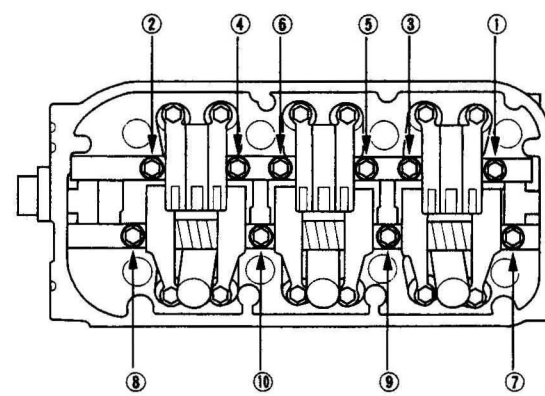
Rocker Arm Assembly Removal

1. Remove the cylinder head cover (see page 6-31).
2. Loosen the adjusting screws (A).



3. Remove the bolts and the rocker arm assembly.
   –1 Unscrew the rocker shaft mounting bolts two turns at a time, in a crisscross pattern, to prevent damaging the valves or rocker arm assembly.
   –2 When removing the rocker arm assembly, do not remove the rocker shaft mounting bolts. The bolts will keep the springs and the rocker arms on the shafts.

CAMSHAFT HOLDER BOLT LOOSENING SEQUENCE:

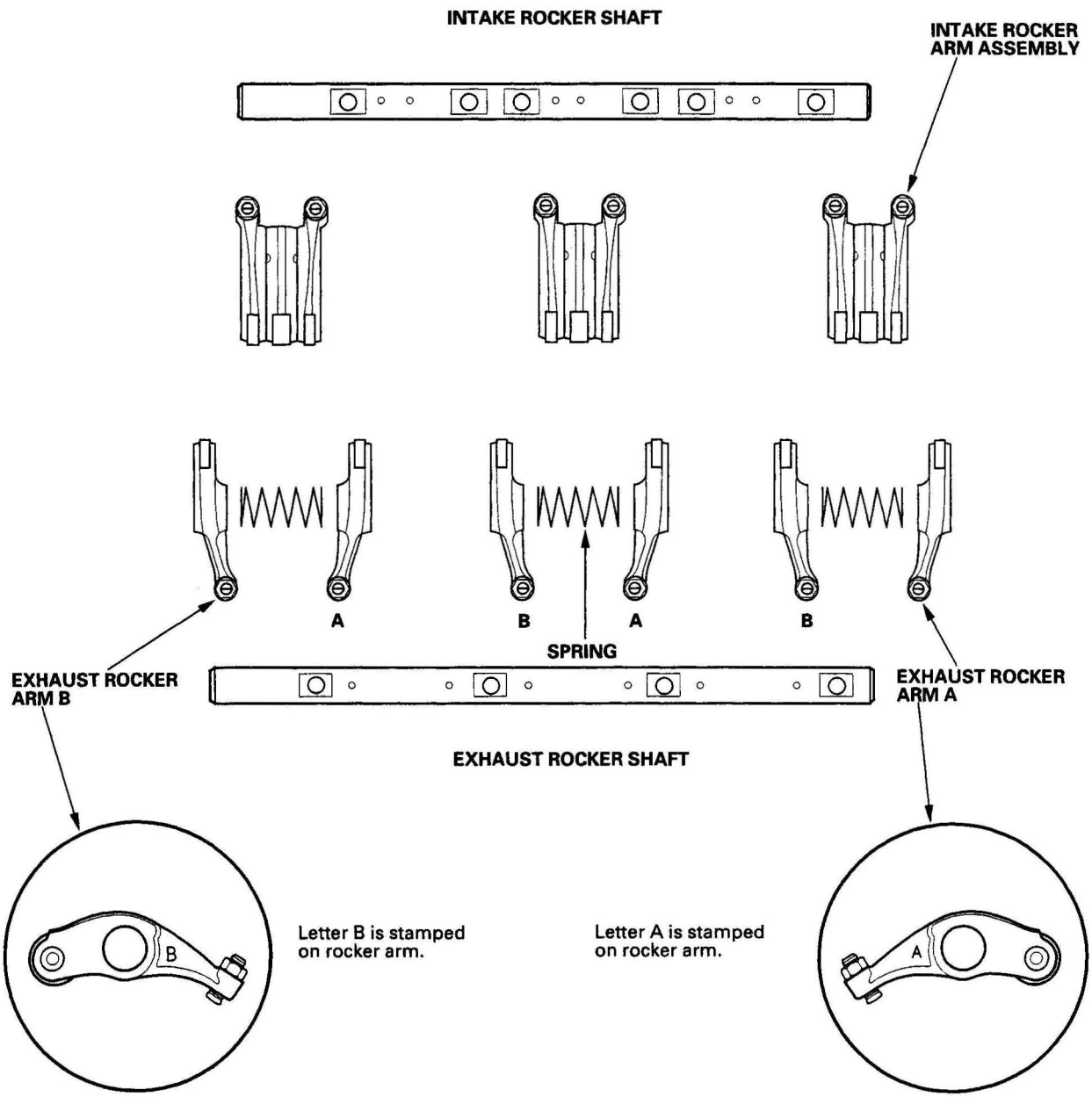


BACK

Protected by AR

Rocker Arms and Shafts Disassembly/Reassembly

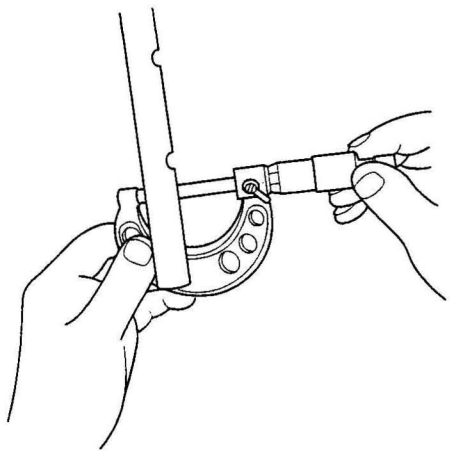
NOTE:
- Identify parts as they are removed so they can be reinstalled in their original locations.
- Inspect the rocker shafts and rocker arms (see page 6-40).
- Rocker arms must be installed in the same positions if reused.
- When removing or installing the rocker arm assembly, do not remove the rocker shaft mounting bolts. The bolts will keep the springs and rocker arms on the shaft.
- Bundle the rocker arms with rubber bands to keep them together as a set.
- Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact points.



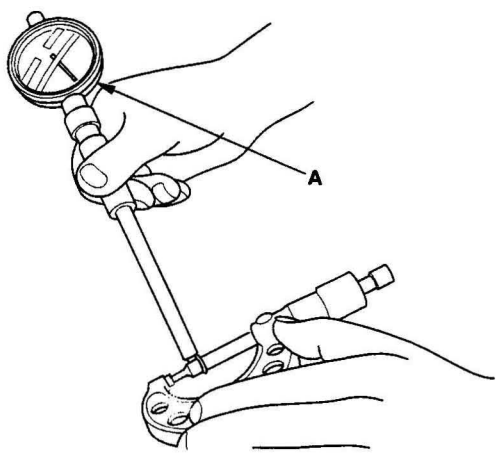
Protected by AR

Rocker Arms and Shafts Inspection

1. Remove the rocker arm assembly (see page 6-38).
2. Measure the diameter of the shaft at the first rocker location.

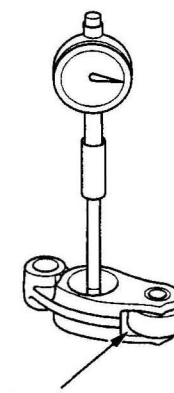


3. Zero the gauge (A) to the shaft diameter.



4. Measure the inside diameter of the rocker arm, and check it for an out-of-round condition.

Rocker Arm-to-Shaft Clearance:
Standard (New):
Intake: 0.026–0.067 mm (0.0010–0.0026 in.)
Service Limit: 0.067 mm (0.0026 in.)
Exhaust: 0.026–0.077 mm (0.0010–0.0030 in.)
Service Limit: 0.077 mm (0.0030 in.)



Inspect rocker arm face for wear.

5. Repeat for all rockers and both shafts. If the clearance is over the limit, replace the rocker shaft and all overtolerance rocker arms. If any intake rocker arm needs replacement, replace all three rocker arms in that set (primary, mid, and secondary).

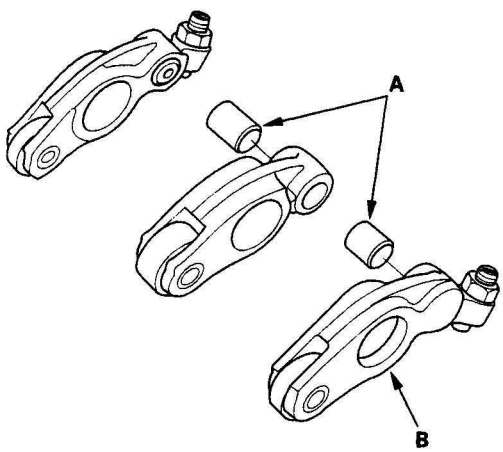
BACK

Protected by AR

VTEC Rocker Arms

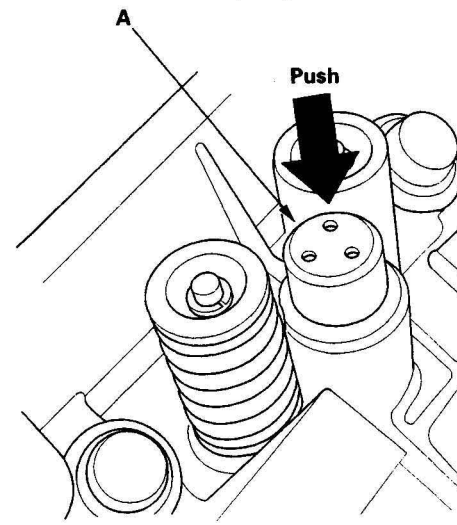
6. Inspect the rocker arm pistons (A). Push them manually. If they do not move smoothly, replace the rocker arm assembly.

   NOTE:
   - Apply oil to the pistons when reassembling.
   - When reassembling the primary rocker arm (B), carefully apply air pressure to the oil passage of the rocker arm.



VTEC Lost Motion Assemblies Inspection

Push on the lost motion assembly (A) with your finger. If it does not move smoothly, replace it.

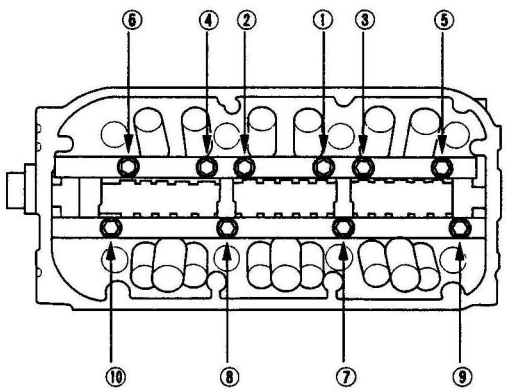


Protected by AR

Camshaft Inspection

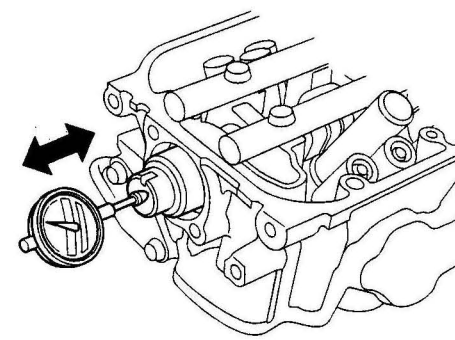
1. Remove the timing belt (see page 6-18).
2. Remove the rocker arms.
3. Put the rocker shafts on the cylinder head, then tighten the bolts to the specified torque.

   Specified torque:
   8 x 1.25 mm
   24 N·m (2.4 kgf·m, 17 lbf·ft)
   Apply engine oil to the bolt threads and flange

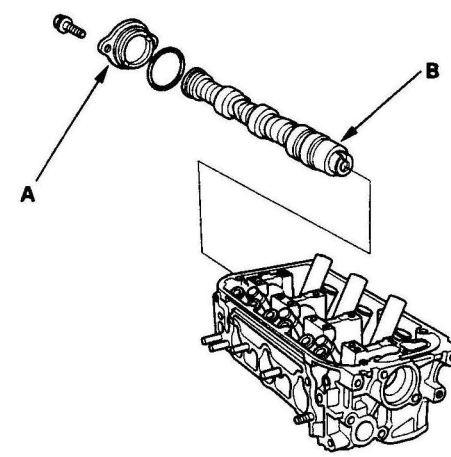


4. Seat the camshaft by pushing it toward the rear of the cylinder head.
5. Zero the dial indicator against the end of the camshaft. Push the camshaft back and forth and read the end play. If the end play is beyond the service limit, replace the thrust cover and recheck. If it is still beyond the service limit, replace the camshaft.

   Camshaft End Play:
   Standard (New): 0.05—0.20 mm (0.002—0.008 in.)
   Service Limit: 0.20 mm (0.008 in.)



6. Remove the camshaft thrust cover (A), then pull out the camshaft (B).

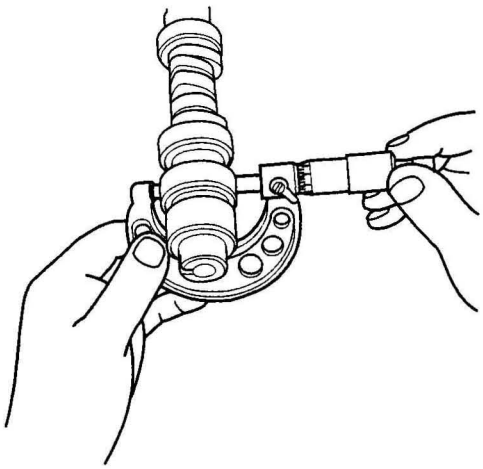


BACK

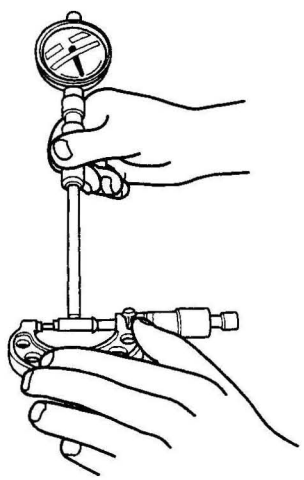
Protected by AR

7. Wipe the camshaft clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored or excessively worn.

8. Measure the diameter of each camshaft journal.



9. Zero the gauge to the journal diameter.

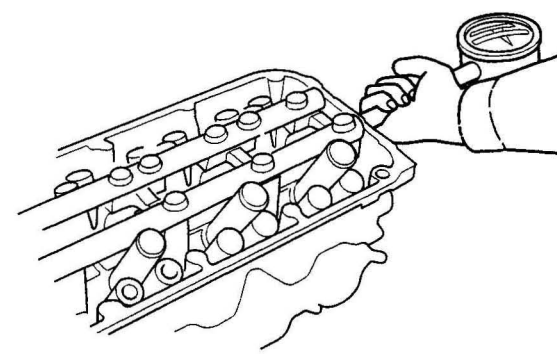


10. Clean the camshaft bearing surfaces in the cylinder head. Measure the inside diameter of each camshaft bearing surface, and check for out-of-round condition.

- If the camshaft-to-holder clearance is within limits, go to step 12.
- If the camshaft-to-holder clearance is beyond the service limit and the camshaft has been replaced, replace the cylinder head.
- If the camshaft-to-holder clearance is beyond the service limit and the camshaft has not been replaced, go to step 11.

Camshaft-to-Holder Oil Clearance:

Standard (New):	**0.050–0.089 mm (0.0020–0.0035 in.)**
Service Limit:	**0.15 mm (0.006 in.)**



(cont'd)

BACK

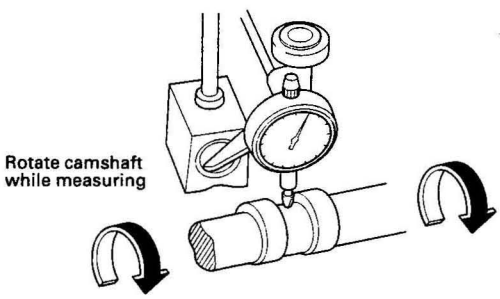
Protected by AR

Camshaft Inspection (cont'd)

11. Check total runout with the camshaft supported on V-blocks.

    - If the total runout of the camshaft is within the service limit, replace the cylinder head.
    - If the total runout is beyond the service limit, replace the camshaft and recheck the oil clearance. If the oil clearance is still out of tolerance, replace the cylinder head.

Camshaft Total Runout:
Standard (New): 0.03 mm (0.001 in.) max.
Service Limit: 0.04 mm (0.002 in.)



12. Measure cam lobe height.

Cam Lobe Height Standard (New):
J32A1 engine ('99 model):

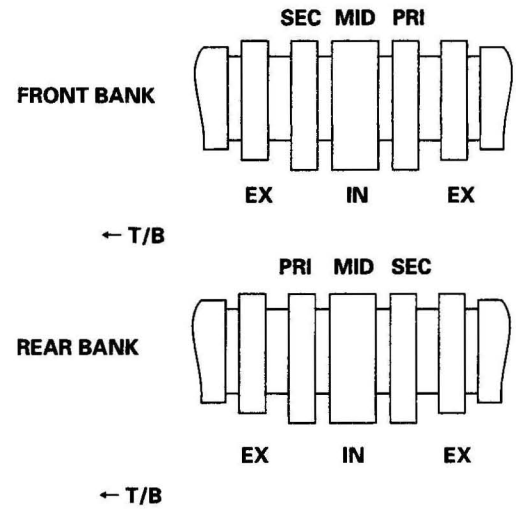
	INTAKE	EXHAUST
PRI	34.615 mm (1.3628 in.)	36.076 mm (1.4203 in.)
MID	36.272 mm (1.4280 in.)	
SEC	31.188 mm (1.2279 in.)	

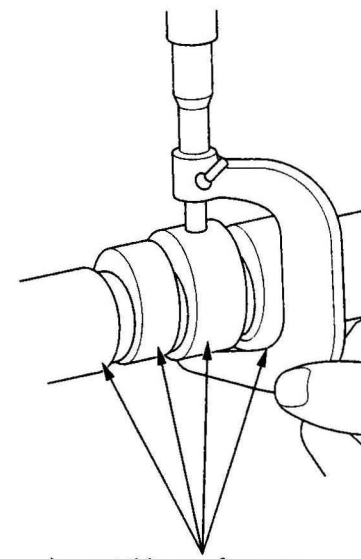
J32A1 engine ('00-03) models:

	INTAKE	EXHAUST
PRI	34.737 mm (1.3676 in.)	36.326 mm (1.4302 in.)
MID	36.445 mm (1.4348 in.)	
SEC	34.919 mm (1.3748 in.)	

J32A2 engine:

	INTAKE	EXHAUST
PRI	34.737 mm (1.3676 in.)	36.389 mm (1.4326 in.)
MID	36.445 mm (1.4348 in.)	
SEC	34.919 mm (1.3748 in.)	





Inspect this area for wear.

BACK

Protected by AR

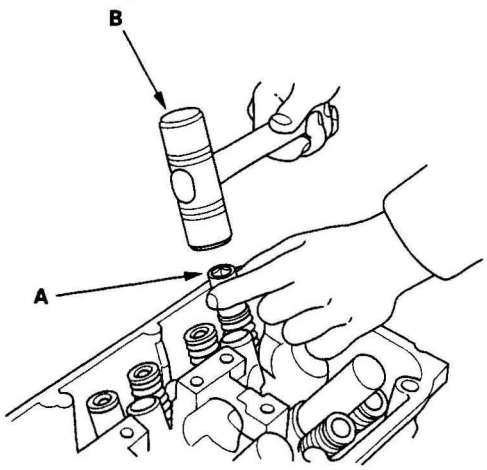
Valves, Springs and Valve Seals Removal

Special Tools Required
- Valve Spring Compressor Attachment 07757-PJ1010A
- Valve Spring Compressor, KD383 with No. 32 jaws, commercially available
- Valve guide seal remover, KD3350, commercially available

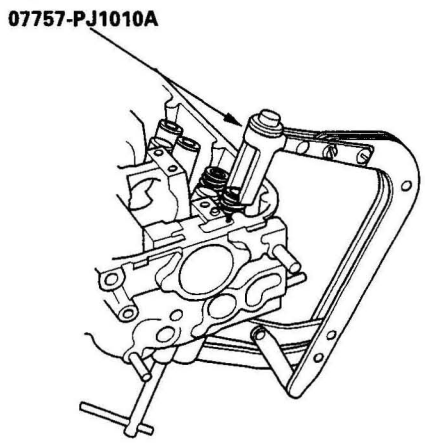
Identify the valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Remove the cylinder head (see page 6-34).

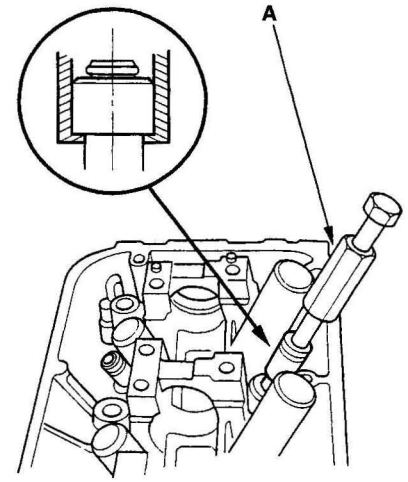
2. Using an appropriate-sized socket (A) and plastic mallet (B), lightly tap the valve retainer to loosen the valve keepers.



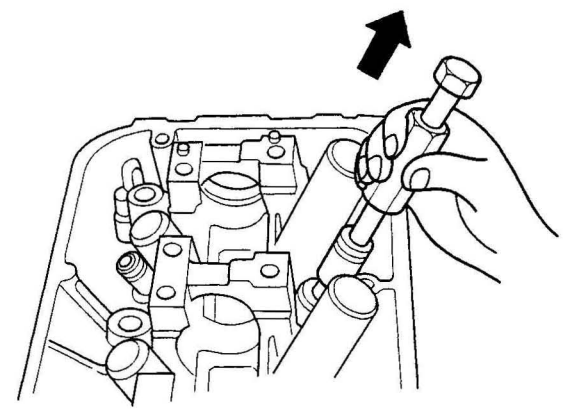
3. Install the valve spring compressor. Compress the spring and remove the valve keepers.



4. Install the valve guide seal remover (A).



5. Remove the valve seal.



BACK

Protected by AR

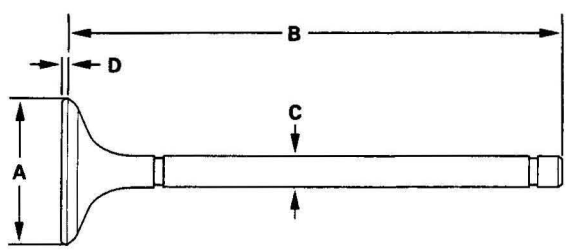
Valve Inspection

'99-01 models

1. Remove the valves (see page 6-45).
2. Measure the valve in these areas.

Intake Valve Dimensions
- A Standard (New): 33.90–34.10 mm (1.335–1.343 in.)
- B Standard (New): 114.85–115.15 mm (4.522–4.533 in.)
- C Standard (New): 5.485–5.495 mm (0.2159–0.2163 in.)
- C Service Limit: 5.455 mm (0.2148 in.)
- D Standard (New): 0.85–1.15 mm (0.033–0.045 in.)
- D Service Limit: 0.65 mm (0.026 in.)

Exhaust Valve Dimensions
- A Standard (New): 28.90–29.10 mm (1.138–1.146 in.)
- B Standard (New): 112.85–113.15 mm (4.443–4.455 in.)
- C Standard (New): 5.450–5.460 mm (0.2146–0.2150 in.)
- C Service Limit: 5.420 mm (0.2134 in.)
- D Standard (New): 1.05–1.35 mm (0.041–0.053 in.)
- D Service Limit: 0.95 mm (0.037 in.)



'02-03 models

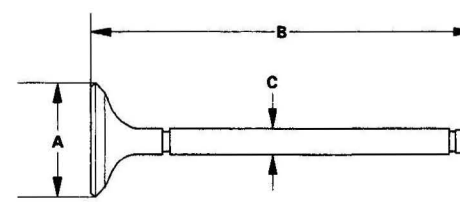
1. Remove the valves (see page 6-45).
2. Measure the valve in these areas.

J32A1 engine:
Intake Valve Dimensions
- A Standard (New): 34.90–35.10 mm (1.374–1.382 in.)
- B Standard (New): 115.70–116.30 mm (4.555–4.579 in.)
- C Standard (New): 5.485–5.495 mm (0.2159–0.2163 in.)
- C Service Limit: 5.455 mm (0.2148 in.)

Exhaust Valve Dimensions
- A Standard (New): 29.90–30.10 mm (1.177–1.185 in.)
- B Standard (New): 113.90–114.50 mm (4.484–4.508 in.)
- C Standard (New): 5.450–5.460 mm (0.2146–0.2150 in.)
- C Service Limit: 5.420 mm (0.2134 in.)

J32A2 engine:
Intake Valve Dimensions
- A Standard (New): 35.90–36.10 mm (1.413–1.421 in.)
- B Standard (New): 116.55–117.15 mm (4.589–4.612 in.)
- C Standard (New): 5.485–5.495 mm (0.2159–0.2163 in.)
- C Service Limit: 5.455 mm (0.2148 in.)

Exhaust Valve Dimensions
- A Standard (New): 29.90–30.10 mm (1.177–1.185 in.)
- B Standard (New): 113.90–114.50 mm (4.484–4.508 in.)
- C Standard (New): 5.450–5.460 mm (0.2146–0.2150 in.)
- C Service Limit: 5.420 mm (0.2134 in.)



BACK

Protected by AR

Valve Stem-to-Guide Clearance Inspection

1. Remove the valves (see page 6-45).

2. Slide the valve out of its guide about 10 mm, then measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

   - If the measurement exceeds the service limit, recheck it using a new valve.
   - If the measurement is now within the service limit, reassemble using a new valve.
   - If the measurement with a new valve still exceeds the service limit, go to step 3.

Intake Valve Stem-to-Guide Clearance:

Standard (New):	**0.04–0.09 mm (0.002–0.004 in.)**
Service Limit:	**0.16 mm (0.006 in.)**

Exhaust Valve Stem-to-Guide Clearance:

Standard (New):	**0.11–0.16 mm (0.004–0.006 in.)**
Service Limit:	**0.24 mm (0.009 in.)**



3. Subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge. Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

Intake Valve Stem-to-Guide Clearance:

Standard (New):	**0.020–0.045 mm (0.0008–0.0018 in.)**
Service Limit:	**0.08 mm (0.003 in.)**

Exhaust Valve Stem-to-Guide Clearance:

Standard (New):	**0.055–0.080 mm (0.0022–0.0031 in.)**
Service Limit:	**0.12 mm (0.005 in.)**

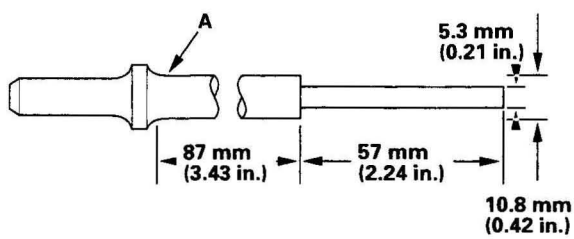
Protected by AR

Valve Guide Replacement

Special Tools Required
- Valve Guide Driver, 5.5 mm 07742-0010100
- Valve Guide Reamer, 5.5 mm 07HAH-PJ7010B

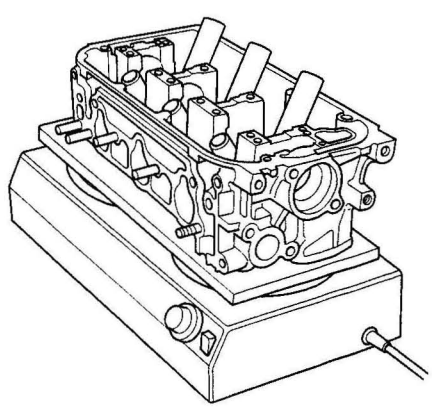
1. Inspect valve stem-to-guide clearance (see page 6-47).

2. As illustrated below, use a commercially available air-impact valve guide driver (A) modified to fit the diameter of the valve guides. In most cases, the same procedure can be done using the special tool and a conventional hammer.



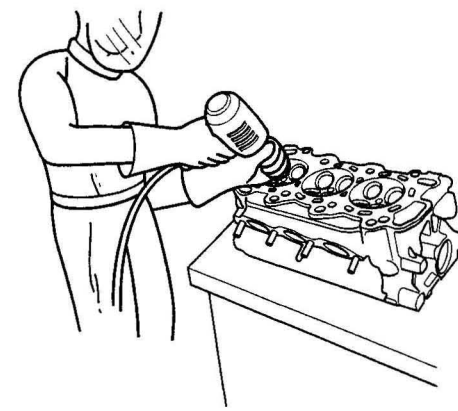
3. Select the proper replacement guides and chill them in the freezer section of a refrigerator for about an hour.

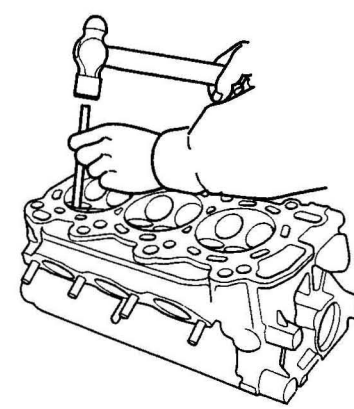
4. Use a hot plate or oven to evenly heat the cylinder head to 300°F (150°C). Monitor the temperature with a cooking thermometer. Do not get the head hotter than 300°F (150°C); excessive heat may loosen the valve seats.



5. Working from the camshaft side, use the driver and an air hammer to drive the guide about 2 mm (0.1 in.) towards the combustion chamber. This will knock off some of the carbon and make removal easier. Hold the air hammer directly in line with the valve guide to prevent damaging the driver. Wear safety goggles or a face shield.

6. Turn the head over and drive the guide out toward the camshaft side of the head.





7. If a valve guide won't move, drill it out with a 8 mm (5/16 in.) bit, then try again. Drill guides only in extreme cases; you could damage the cylinder head if the guide breaks.

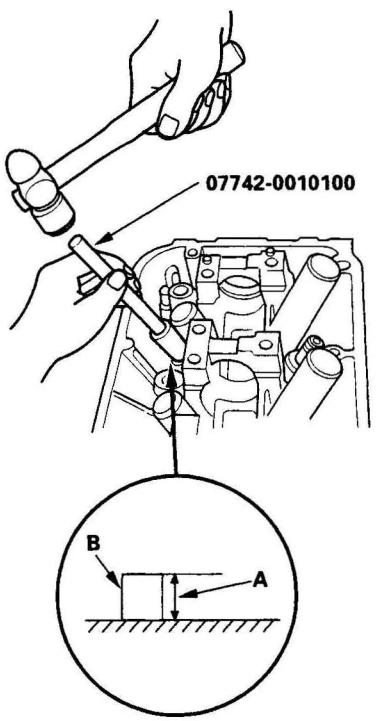
8. Remove the new guide(s) from the freezer, one at a time, as you need them.

BACK

Protected by AR

9. Apply a thin coat of clean engine oil to the outside of the new valve guide. Install the guide from the camshaft side of the head; use the special tool to drive the guide in to the specified installed height (A) of the guide (B). If you have all 12 guides to do, you may have to reheat the head.

Valve Guide Installed Height:
Intake: 21.20–22.20 mm (0.835–0.874 in.)
Exhaust: 20.63–21.63 mm (0.812–0.852 in.)



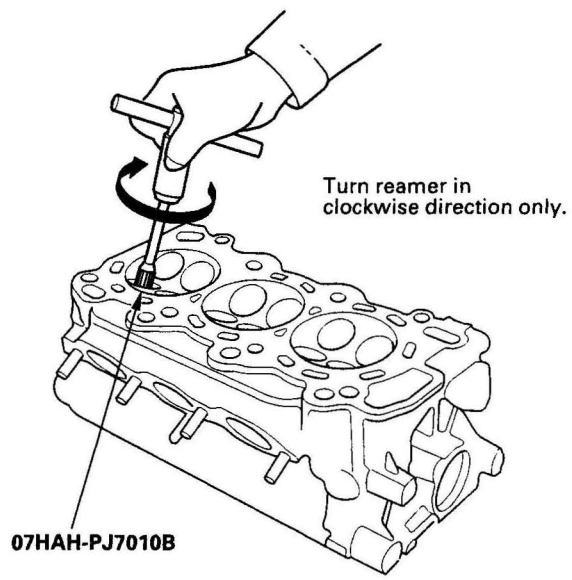
10. Coat both the reamer and the valve guide with cutting oil.

11. Rotate the reamer clockwise the full length of the valve guide bore.

12. Continue to rotate the reamer clockwise while removing it from the bore.

13. Thoroughly wash the guide with detergent and water to remove any cutting residue.

14. Check the clearance with a valve (see page 6-47). Verify that the valve slides in the intake and exhaust valve guides without exerting pressure.

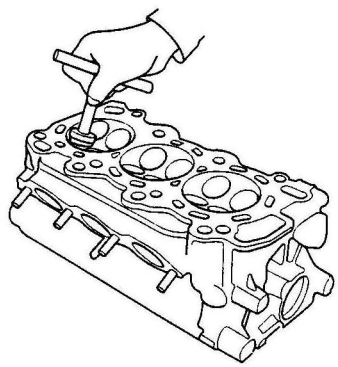


BACK

Protected by AR

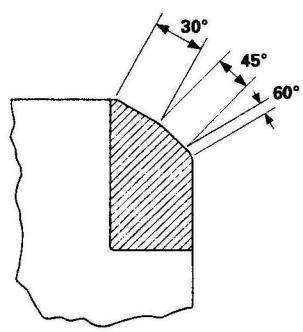
Valve Seat Reconditioning

1. Inspect valve stem-to-guide clearance (see page 6-47). If the valve guides are worn, replace them (see page 6-48) before cutting the valve seats.
2. Renew the valve seats in the cylinder head using a valve seat cutter.

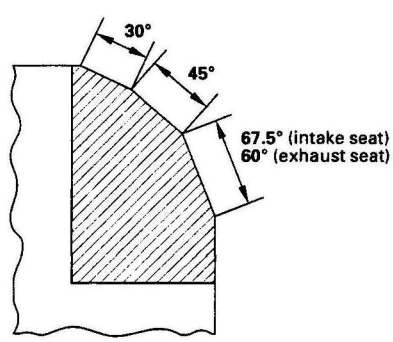


3. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
4. Bevel the upper and lower edges at the angles shown in the illustration.
   Check the width of the seat and adjust accordingly.

'99 model:



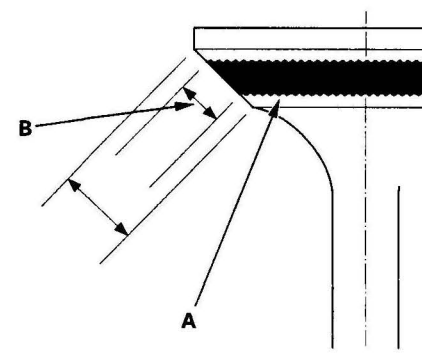
'01-03 models:



5. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

   Valve Seat Width:
   Standard (New): 1.25–1.55 mm (0.049–0.061 in.)
   Service Limit: 2.00 mm (0.079 in.)

6. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue compound (A) to the valve face. Insert the valve in its original location in the head, then lift it and snap it closed against the seat several times.



7. The actual valve seating surface (B), as shown by the blue compound, should be centered on the seat.
   - If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter ('99 model and '01-03 models exhaust side) or the 67.5° cutter ('01-03 models intake side) to move it down, then one more cut with the 45 ° cutter to restore seat width.
   - If it is too low (close to the valve edge), you must make a second cut with the 30° cutter to move it up, then make one more cut with the 45° cutter to restore seat width.

   NOTE: The final cut should always be made with the 45° cutter.

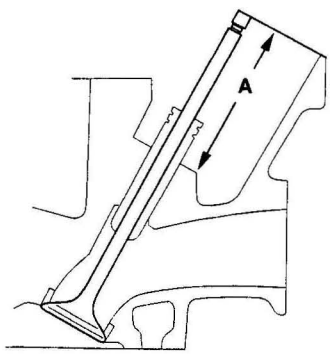
BACK

Protected by AR

8. Insert the intake and exhaust valves in the head and measure the valve stem installed height (A).

Intake Valve Stem Installed Height:
Standard (New): 46.75 – 47.55 mm (1.841 – 1.872 in.)
Service Limit: 47.80 mm (1.882 in.)

Exhaust Valve Stem Installed Height:
Standard (New): 46.68 – 47.48 mm (1.838 – 1.869 in.)
Service Limit: 47.73 mm (1.879 in.)



9. If the valve stem installed height is over the service limit, replace the valve and recheck. If it is still over the service limit, replace the cylinder head; the valve seat in the head is too deep.

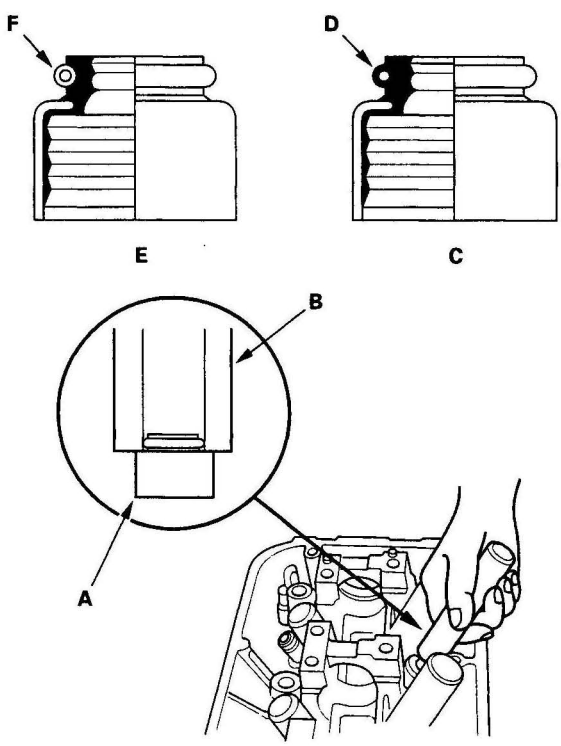
Protected by AR

Valves, Springs, and Valve Seals Installation

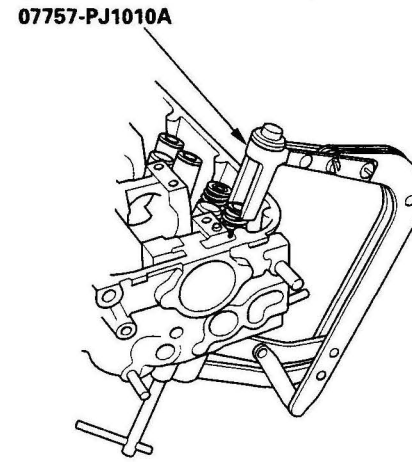
Special Tools Required
- Valve Spring Compressor Attachment 07757-PJ1010A
- Valve Spring Compressor, KD383 with No. 32 jaws, commercially available
- Valve guide seal installer, KD3372, commercially available

1. Coat the valve stems with engine oil. Install the valves in the valve guides.
2. Check that the valves move up and down smoothly.
3. Install the spring seats on the cylinder head.
4. Install the new valve seals (A) using the valve guide seal installer (B).

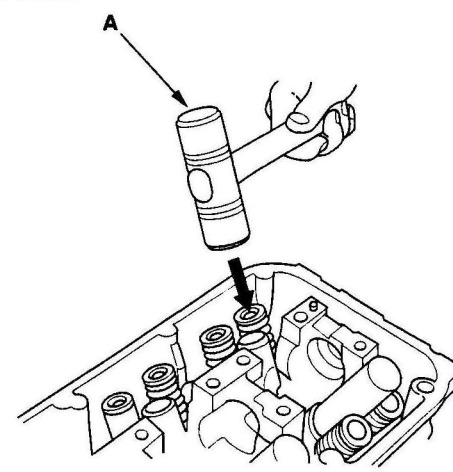
   NOTE: Exhaust valve seals (C) have a black spring (D) and intake valve seals (E) have a white spring (F); they are not interchangeable.



5. Install the valve spring and valve retainer. Place the end of the valve spring with closely wound coils toward the cylinder head.
6. Install the valve spring compressor. Compress the spring and install the valve keepers.



7. Lightly tap the end of each valve stem two or three times with a plastic mallet (A) to ensure proper seating of the valve and valve keepers. Tap the valve stem only along its axis so you do not bend the stem.



BACK

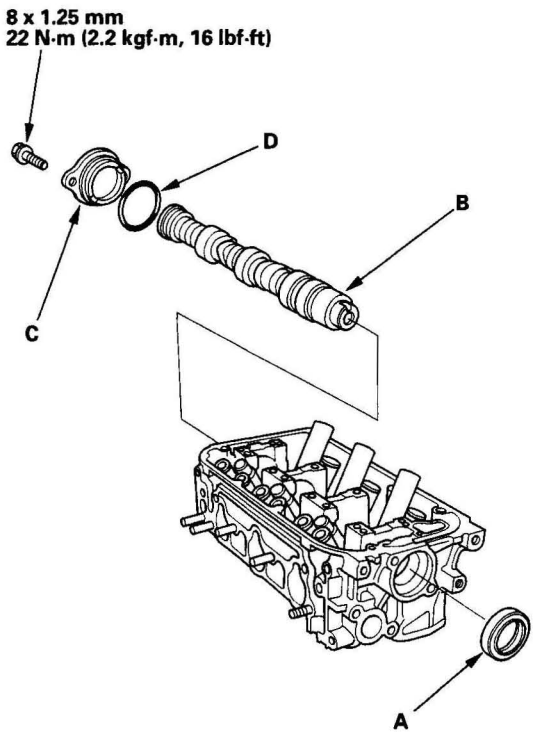
Protected by AR

Camshaft/Rocker Arms, Camshaft Seal, and Pulley Installation

1. Apply a light coat of oil around the camshaft oil seal.

2. Gently tap the new camshaft oil seal (A) into the cylinder head.

   -1 Tap the camshaft oil seal in squarely.
   -2 Install the oil seal about 0.5–1.5 mm (0.02–0.06 in.) below the surface of the cylinder head.



3. Insert the camshaft (B) into the cylinder head, then install the camshaft thrust cover (C). Always use a new O-ring (D).

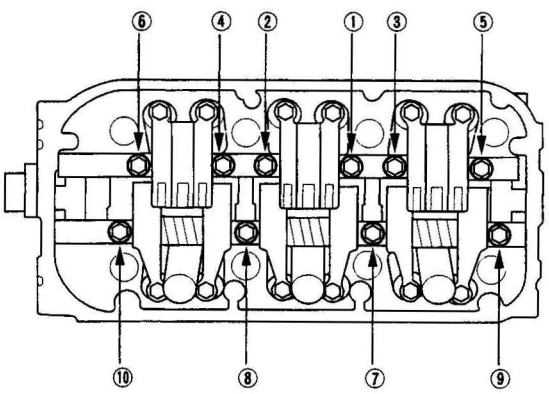
4. Check that the oil seal lips are not distorted.

5. Loosen the valve adjusting screws.

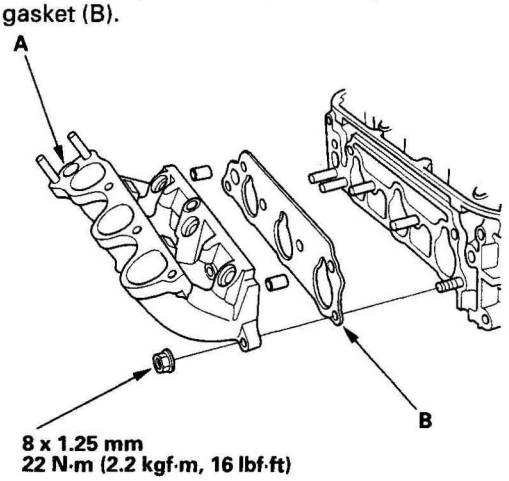
6. Set the rocker arm assembly in place and loosely install the bolts. Make sure that the rocker arms are properly positioned on the valve stems.

7. Tighten each bolt two turns at a time in the sequence shown below to ensure that the rockers do not bind on the valves.

   Specified torque:
   8 x 1.25 mm
   24 N·m (2.4 kgf·m, 17 lbf·ft)
   Apply engine oil to the bolt threads



8. Install the injector base (A). Always use a new gasket (B).

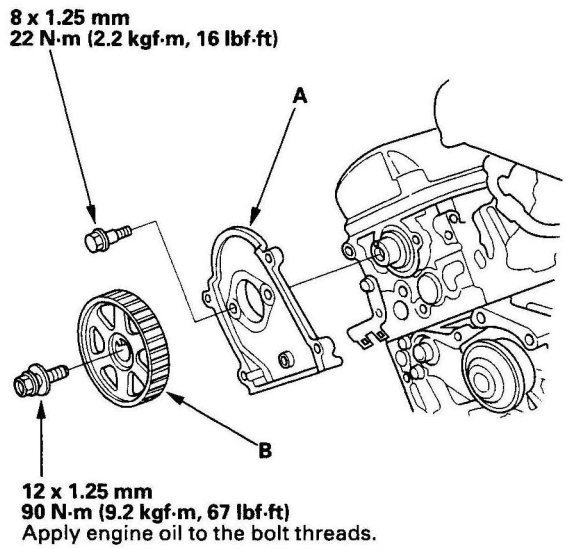


(cont'd)

Protected by AR

Camshaft/Rocker Arms, Camshaft Seal, and Pulley Installation (cont'd)

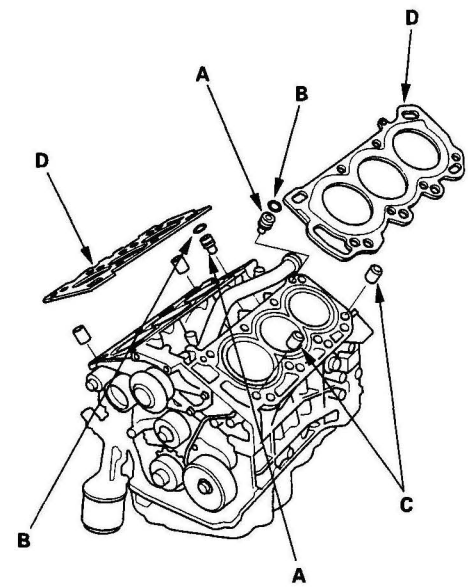
9. Install the back cover (A), then install the camshaft pulley (B).



Cylinder Head Installation

Install the cylinder head in the reverse order of removal:

1. Clean the cylinder head and block surface.
2. Clean and install the oil control orifices (A) with the new O-rings (B).



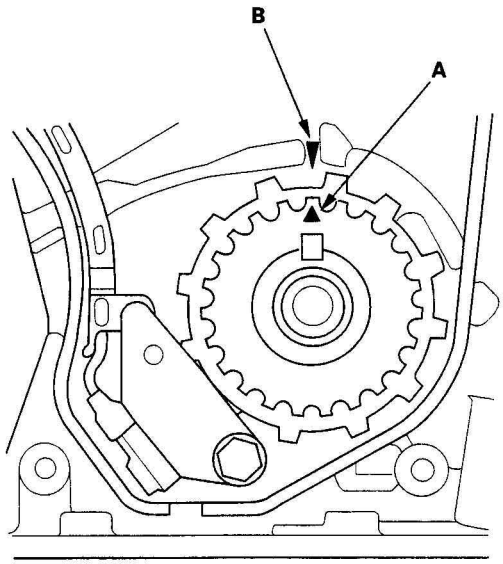
3. Install the dowel pins (C) and new cylinder head gaskets (D).

BACK

Protected by AR

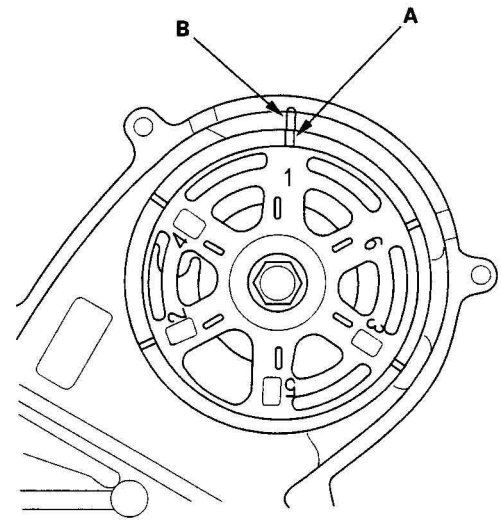
4. Clean the timing belt drive pulley.

5. Set the timing belt drive pulley to top dead center (TDC) by aligning the TDC mark (A) on the tooth of the timing belt drive pulley with the pointer (B) on the oil pump.

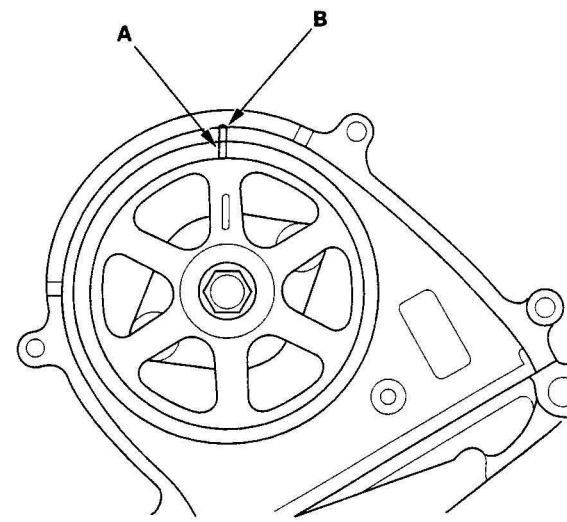


6. Clean the camshaft pulleys. Set the camshaft pulleys to TDC by aligning the TDC marks (A) on the camshaft pulleys with the pointers (B) on the back covers.

FRONT:



REAR:



(cont'd)

BACK

Protected by AR

Cylinder Head Installation (cont'd)

7. Apply clean engine oil to the threads and flanges of the cylinder head bolts.

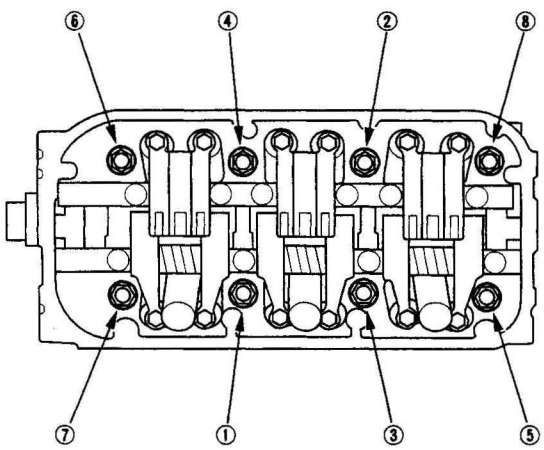
8. Tighten the cylinder head bolts sequentially in three steps.

   NOTE: Perform each step twice.

   1st step torque: 39 N·m (4.0 kgf·m, 29 lbf·ft)
   2nd step torque: 69 N·m (7.0 kgf·m, 51 lbf·ft)
   3rd step torque: 98.1 N·m (10.0 kgf·m, 72.3 lbf·ft)

   Use a beam-type torque wrench. When using a preset-type torque wrench, be sure to tighten slowly and not to overtighten.
   If a bolt makes any noise while you are torquing it, loosen the bolt, and retighten it from the 1st step.

CYLINDER HEAD BOLTS TORQUE SEQUENCE:



9. Install the timing belt (see page 6-21).

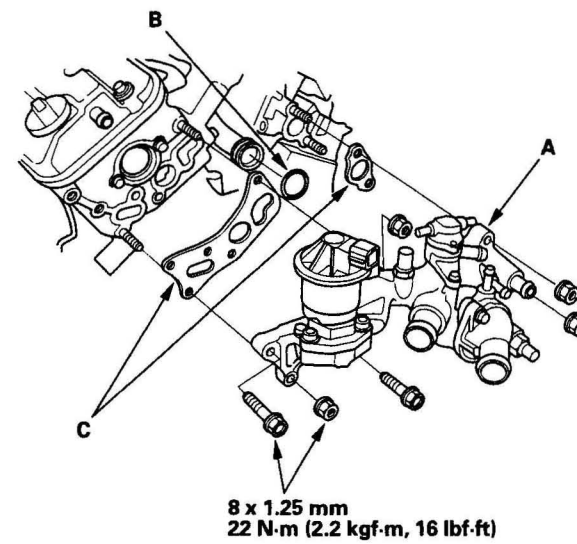
10. Adjust the valve clearance (see page 6-13).

11. Install the cylinder head cover (see page 6-32).

12. Install the exhaust manifold and tighten the nuts in a crisscross pattern in two or three steps, beginning with the inner nut (see page 9-11). Always use new exhaust manifold gasket.

13. Install the nuts securing the exhaust pipe A and exhaust manifold, then install the cover on the exhaust manifold.

14. Install the water passage (A). Always use a new O-ring (B) and new gaskets (C).

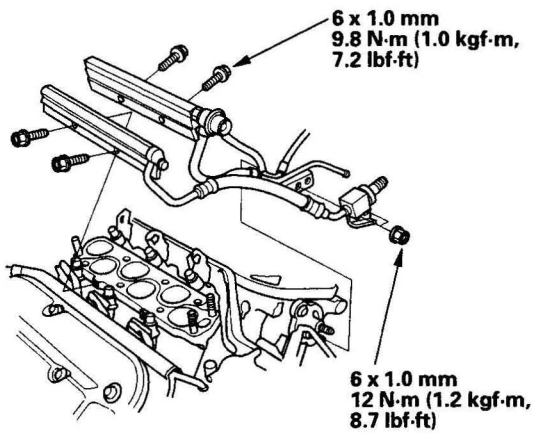


BACK

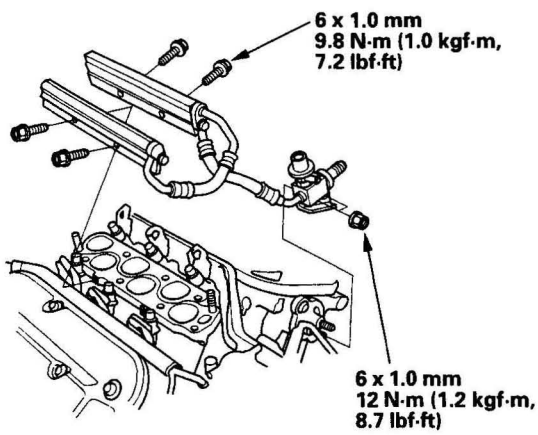
Protected by AR

15. Install the fuel rails.

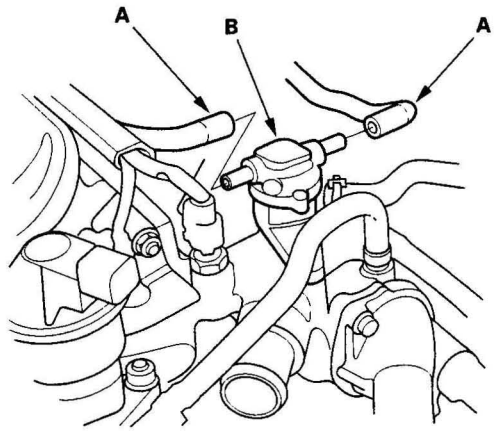
'99 model:



'00-03 models:

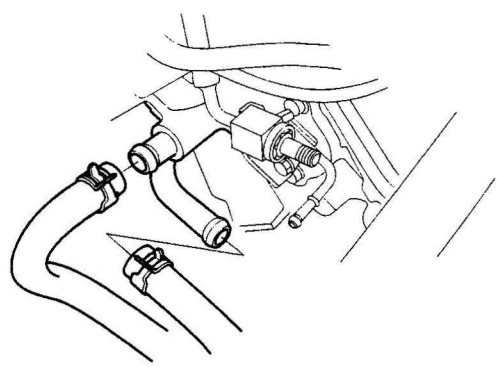


16. Install the vacuum hoses (A) on the intake air bypass control thermal valve (B).

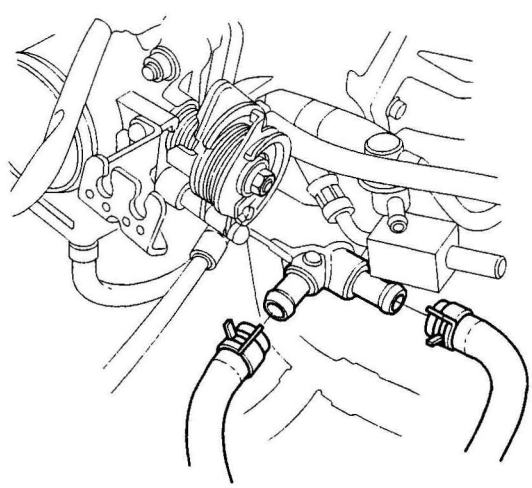


17. Install the heater hoses.

'99 model:



'00-03 models:

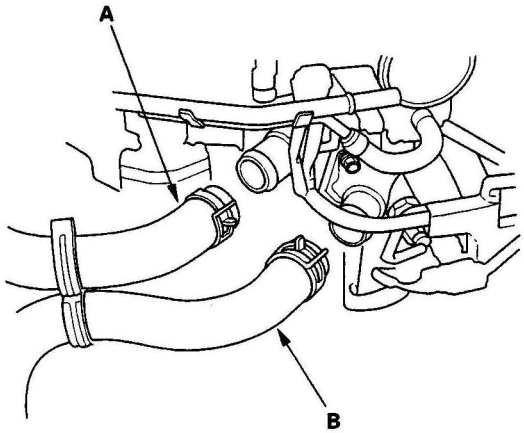


(cont'd)

Protected by AR

Cylinder Head Installation (cont'd)

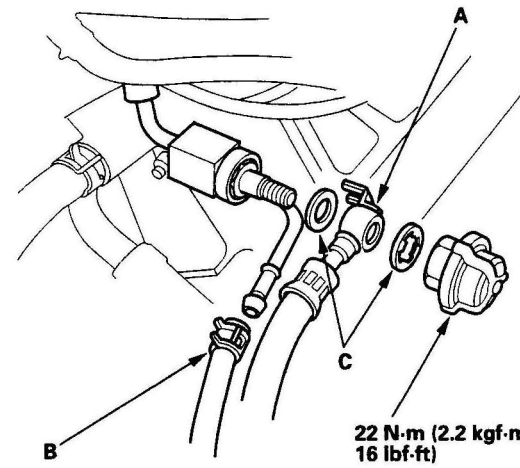
18. Install the upper radiator hose (A) and lower radiator hose (B).



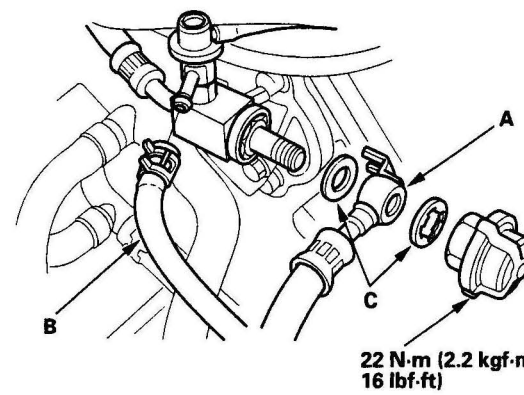
19. Install the intake manifold (see page 9-8).
20. Loosely install the P/S pump and P/S pump belt.
21. Adjust the P/S pump belt (see page 17-14).
22. Install the alternator (see page 4-23).
23. Install the alternator belt (see page 4-23).

24. Install the fuel feed hose (A) and fuel return hose (B), using new washers (C).

'99 model:



'00-03 models:



BACK

Protected by AR

25. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.

26. After installation, check that all tubes, hoses and connectors are installed correctly.

27. Inspect for fuel leaks. Turn the ignition switch ON (II) (do not operate the starter) so the fuel pump runs for about 2 seconds and pressurizes the fuel line. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.

28. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-13).

29. Perform the powertrain control module (PCM) idle learn procedure (see page 11-158).

30. Perform the power window control unit reset procedure ('02-03 models) (see page 22-308).

31. Inspect the idle speed (see page 11-157).

32. Inspect the ignition timing (see page 4-16).

CMP (TDC) Sensor Replacement

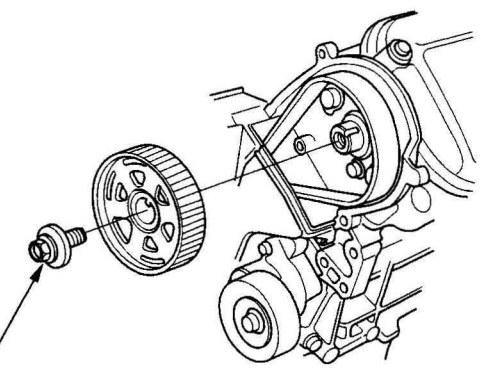
1. Set the No. 1 piston at top dead center (TDC) (see page 6-18).

2. Remove the upper covers.

3. To hold the timing belt adjuster in its current position, thread in the battery clamp bolt hand-tight (see step 13 on page 6-20).

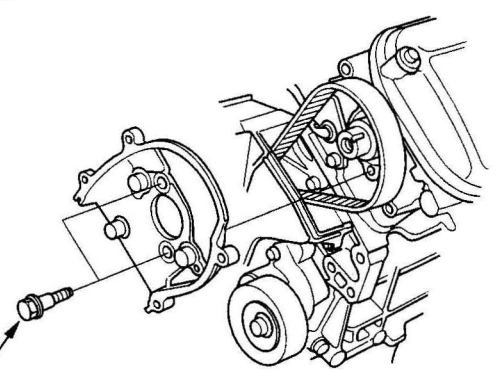
4. Loosen the idler pulley bolt about five or six turns, then remove the timing belt from the front camshaft pulley (see step 16 on page 6-21).

5. Remove the front camshaft pulley.



12 x 1.25 mm
90 N·m (9.2 kgf·m, 67 lbf·ft)
Apply engine oil to the bolt threads.

6. Disconnect the camshaft position (CMP) sensor A/B (TDC sensor 1/2) connector, then remove the back cover.



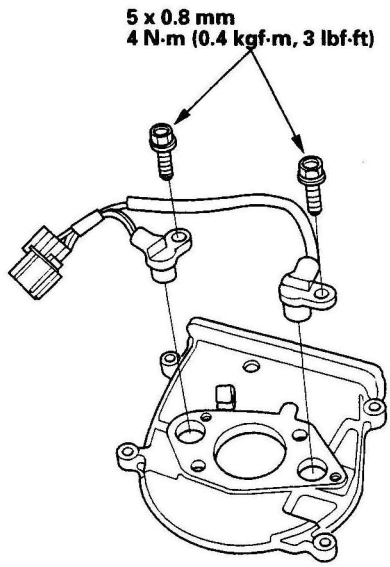
8 x 1.25 mm
22 N·m (2.2 kgf·m, 16 lbf·ft)

(cont'd)

Protected by AR

CMP (TDC) Sensor Replacement (cont'd)

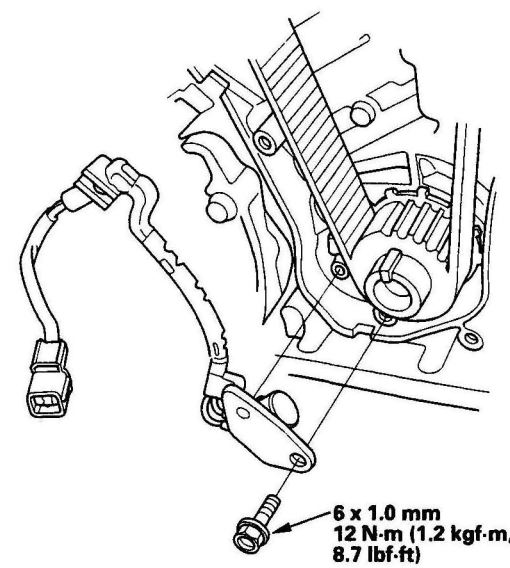
7. Remove the CMP (TDC 1/TDC 2) sensor from the back cover.



8. Install the CMP (TDC 1/TDC 2) sensor in reverse order of removal. Reinstall the timing belt (see page 6-21) and other removed components.

CKP Sensor Replacement

1. Move the auto-tensioner to remove tension from the alternator belt, then remove the alternator belt (see step 5 on page 6-18).
2. Loosen the adjusting bolt, locknut and mounting bolt, then remove the power steering (P/S) pump belt (see step 6 on page 6-19).
3. Remove the dipstick and tube (see step 9 on page 6-19).
4. Remove the crankshaft pulley (see step 10 on page 6-19).
5. Remove the upper and lower covers (see step 12 on page 6-20).
6. Remove the crankshaft position (CKP) sensor from the oil pump.

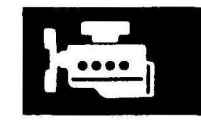


7. Install the CKP sensor in the reverse order of removal.

BACK

Protected by AR

Engine Mechanical



Engine Block

Special Tools 7-2
Component Location Index 7-3
Drive Plate Removal and Installation 7-6
Connecting Rod and Crankshaft End Play Inspection 7-7
Crankshaft Main Bearing Replacement 7-8
Connecting Rod Bearing Replacement 7-10
Crankshaft and Pistons Removal 7-12
Crankshaft Inspection 7-14
Block and Piston Inspection 7-15
Cylinder Honing 7-17
Piston, Pin, and Connecting Rod Replacement 7-18
Piston Rings Replacement 7-21
Crankshaft and Piston Installation 7-23
Pulley End Crankshaft Seal Installation -In-car 7-28
Transmission End Crankshaft Seal Installation -In-car 7-28

Protected by AR

Special Tools

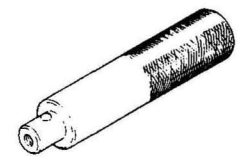
Ref. No.	Tool Number	Description	Qty
①	07LAD-PT3010A	Oil Seal Driver	1
②	07VAD-P8A010A	Oil Seal Driver Attachment, 80 mm I.D.	1
③	07749-0010000	Driver	1



①



②

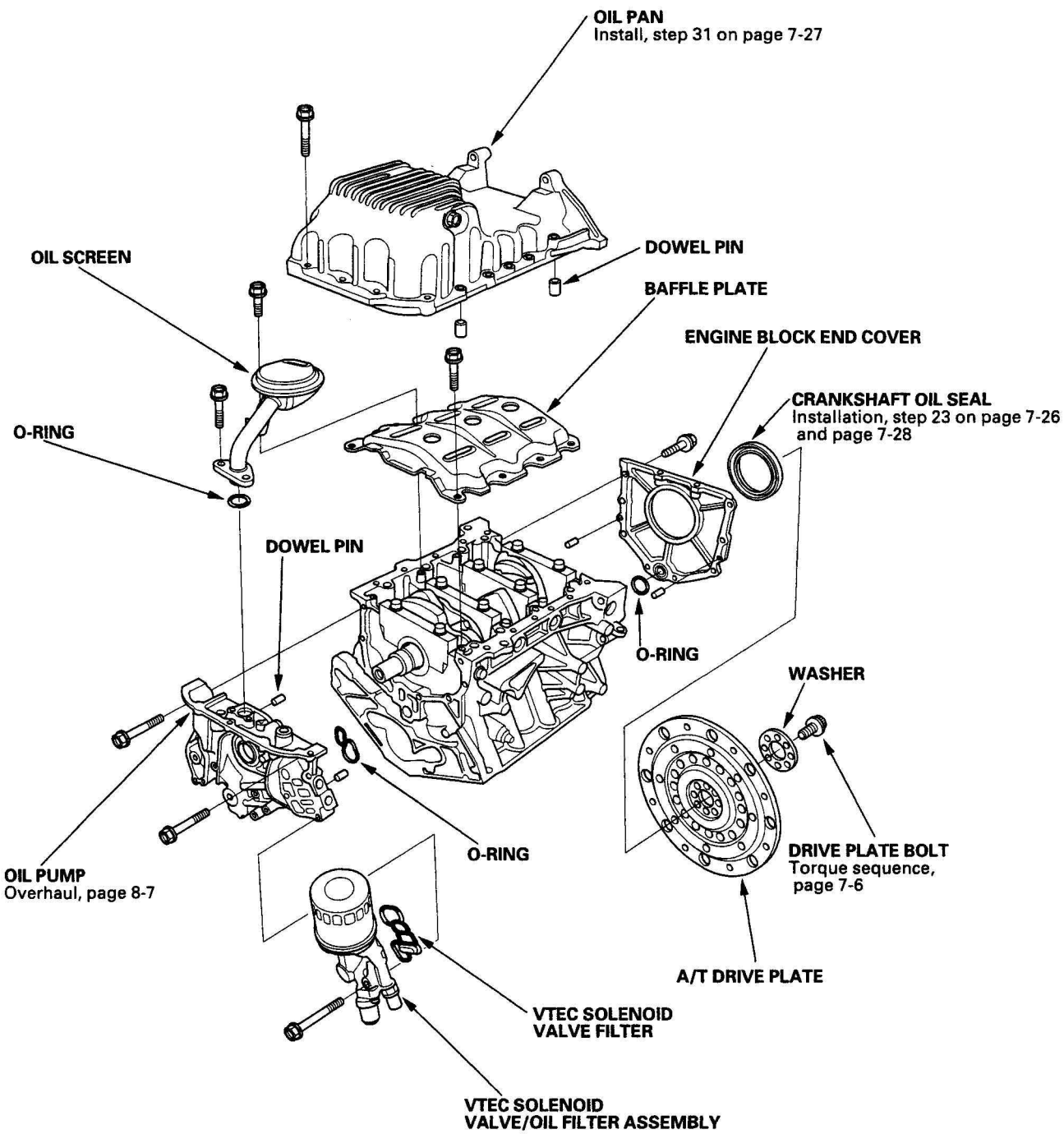


③

BACK

Protected by AR

Component Location Index

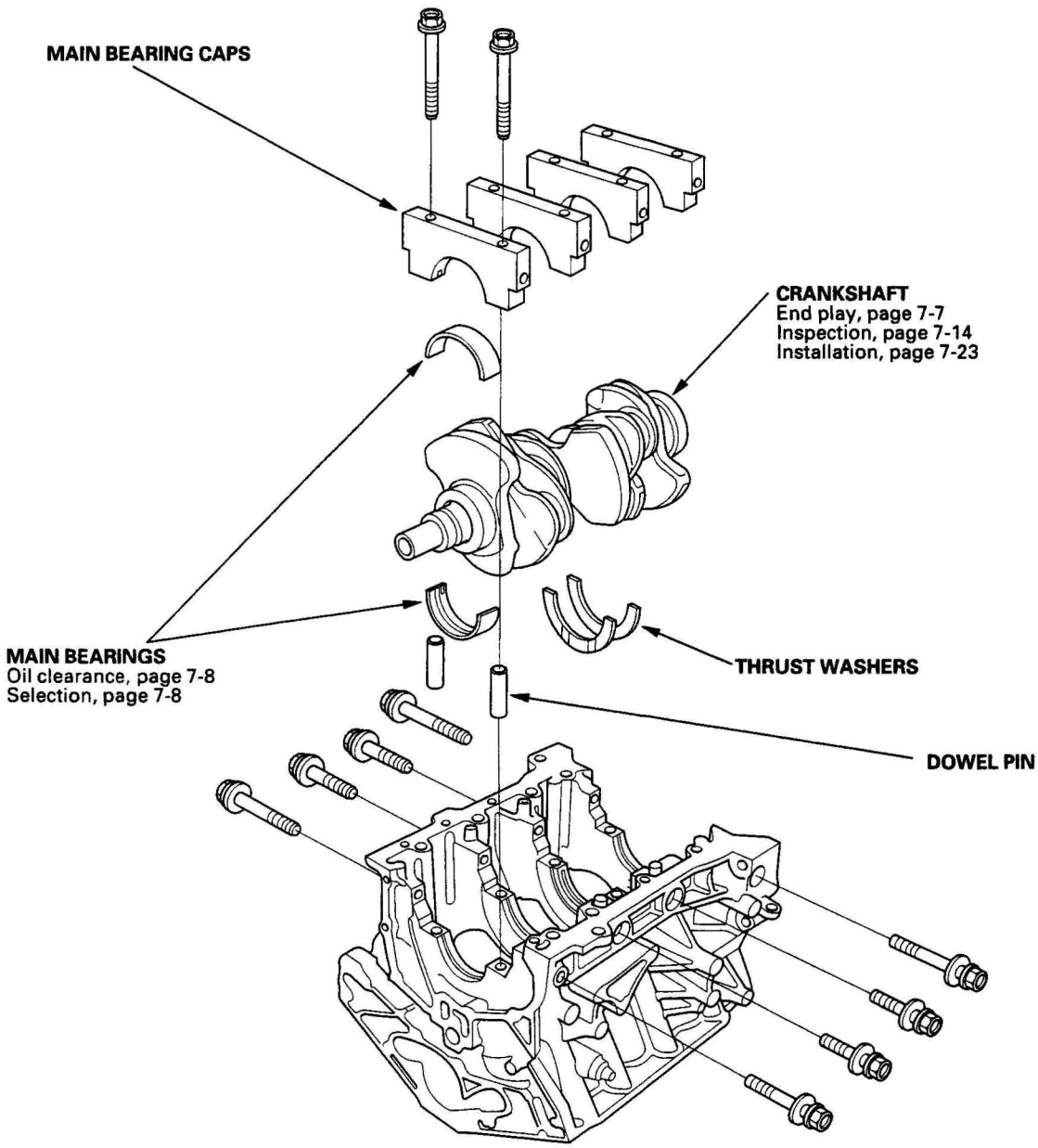


(cont'd)

BACK

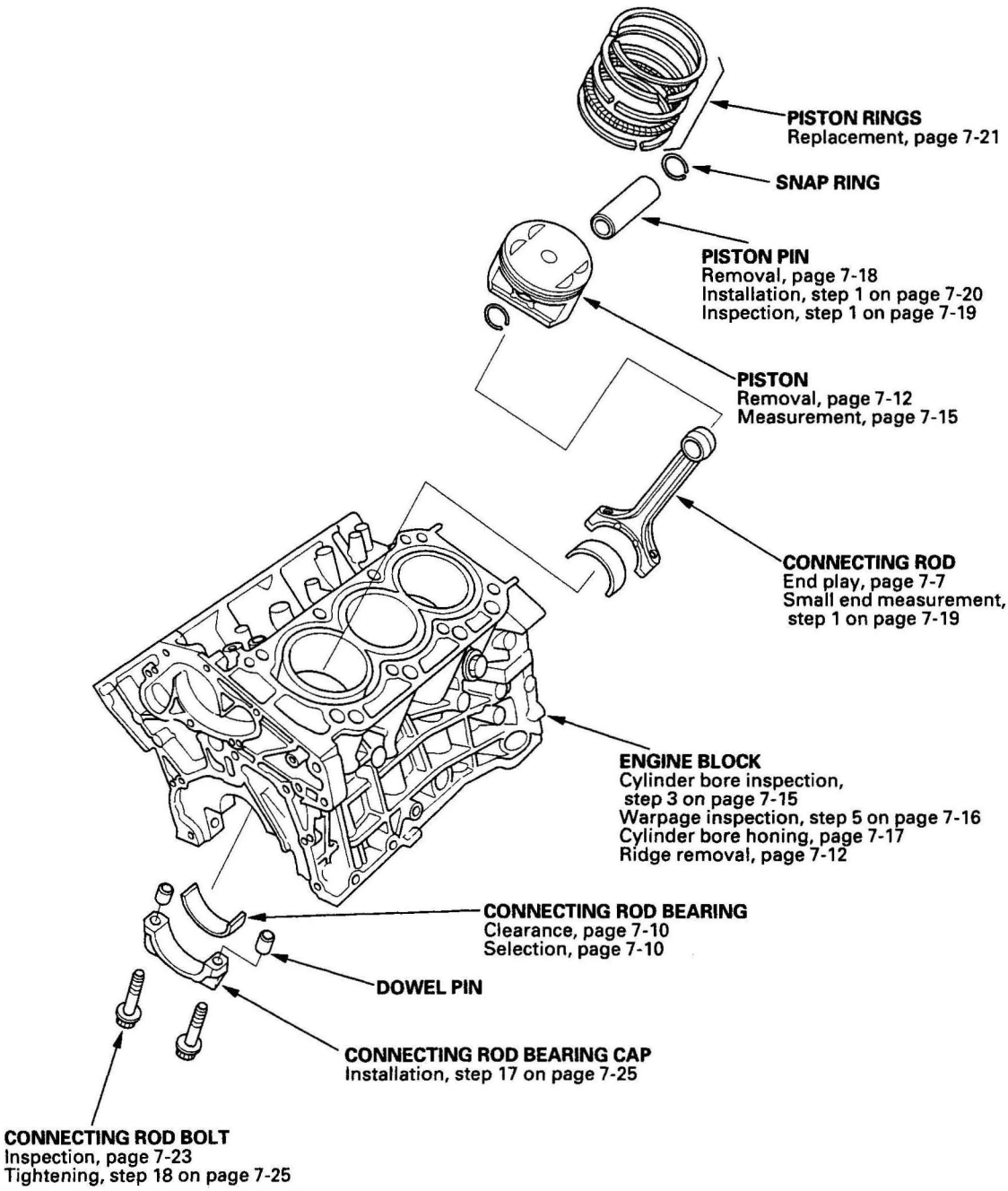
Protected by AR

Component Location Index (cont'd)



BACK

Protected by AR



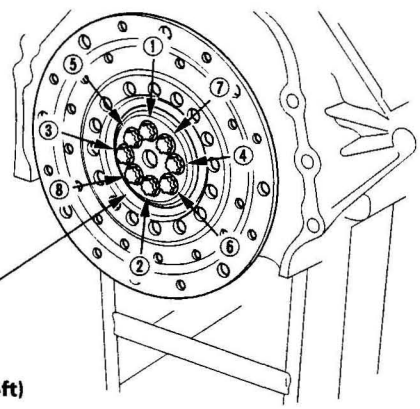
BACK

Protected by AR

Drive Plate Removal and Installation

1. Remove the transmission:
   - '99 model (see page 14-110).
   - '00-03 models (see page 14-351).

2. Remove the eight drive plate bolts, then separate the drive plate from the crankshaft flange. After installation, tighten the bolts in the sequence shown.



3. Install the transmission:
   - '99 model (see page 14-117).
   - '00-03 models (see page 14-359).

BACK

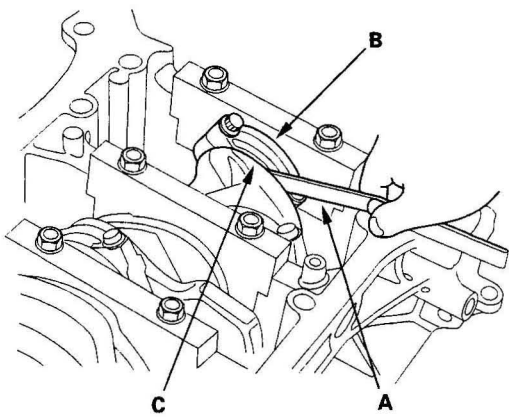
Protected by AR

Connecting Rod and Crankshaft End Play Inspection

1. Remove the baffle plate (see page 7-12).

2. Measure the connecting rod end play with a feeler gauge (A) between the connecting rod (B) and crankshaft (C).

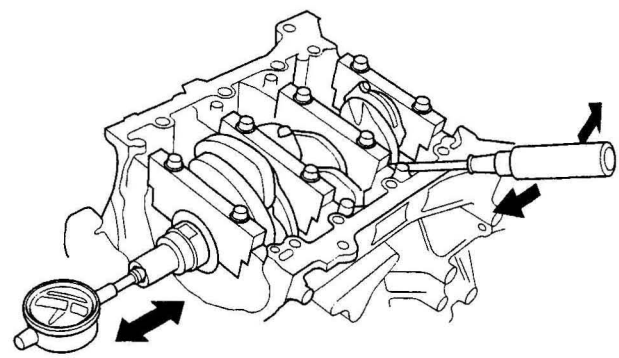
   Connecting Rod End Play:
   Standard (New): 0.15–0.35 mm (0.006–0.014 in.)
   Service Limit: 0.45 mm (0.018 in.)



3. If the connecting rod end play is out-of-tolerance, install a new connecting rod and recheck. If it still out-of-tolerance, replace the crankshaft (see page 7-12).

4. Push the crankshaft firmly away from the dial indicator, and zero the dial against the end of the crankshaft. Then pull the crankshaft firmly back toward the indicator; dial reading should not exceed the service limit.

   Crankshaft End Play:
   Standard (New): 0.10–0.35 mm (0.004–0.014 in.)
   Service Limit: 0.45 mm (0.018 in.)



5. If the end play is out-of-tolerance, replace the thrust washers and recheck. If it is still out-of-tolerance, replace the crankshaft.

Protected by AR

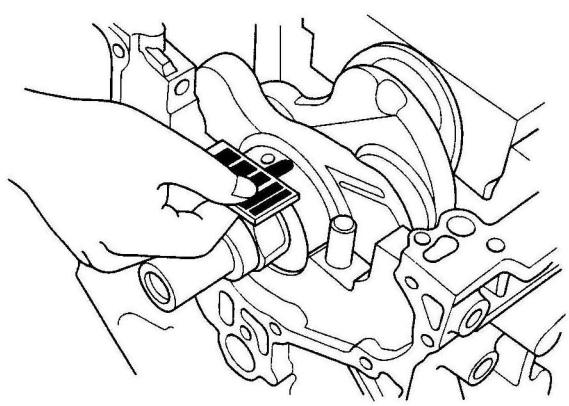
Crankshaft Main Bearing Replacement

Main Bearing Clearance Inspection

1. To check main bearing-to-journal oil clearance, remove the main caps and bearing halves.
2. Clean each main journal and bearing half with a clean shop towel.
3. Place one strip of plastigage across each main journal.

   NOTE: If the engine is still in the car when you bolt the main cap down to check the clearance, the weight of the crankshaft and drive plate will flatten the plastigage further than just the torque on the cap bolt and give you an incorrect reading. For an accurate reading, support the crank with a jack under the counterweights, and check only one bearing at a time.
4. Reinstall the bearings and caps, then torque the bolts (see step 21 on page 7-25). Do not rotate the crankshaft.
5. Remove the cap and bearing half, and measure the widest part of the plastigage.

   Main Bearing-to-Journal Oil Clearance:
   Standard (New): 0.020–0.044 mm (0.0008–0.0017 in.)
   Service Limit: 0.050 mm (0.0020 in.)



6. If the plastigage measures too wide or too narrow, (remove the engine if it's still in the car), remove the crankshaft, and remove the upper half of the bearing. Install a new, complete bearing with the same color code, and recheck the clearance. Do not file, shim, or scrape the bearings or the caps to adjust clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again. If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

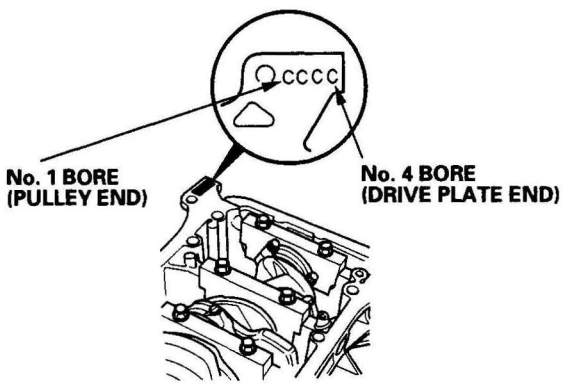
BACK

Protected by AR

Main Bearing Selection

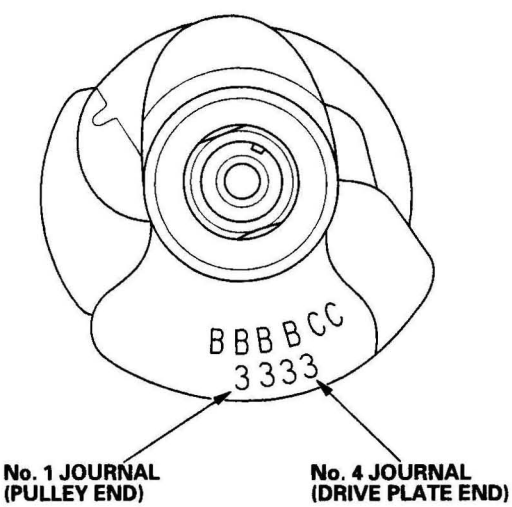
Crankshaft Bore Code Location

1. Letters or Bars have been stamped on the end of the block as a code for the size of each of the 4 main journal bores.
   If you can not read the codes because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.



Main Journal Code Locations (Numbers or Bars)

2. Numbers or bars have been stamped on the crankshaft No. 1 web as a code for the main journal sizes.



3. Use the crankshaft bore codes and journal codes to select the appropriate main bearings from the table.

Larger crank bore →

Smaller main Journal	A or I	B or II	C or III	D or IIII
	Smaller bearing (Thicker) →			
1 or I	Red/ Pink	Pink	Pink/ Yellow	Yellow
2 or II	Pink	Pink/ Yellow	Yellow	Yellow/ Green
3 or III	Pink/ Yellow	Yellow	Yellow/ Green	Green
4 or IIII	Yellow	Yellow/ Green	Green	Green/ Brown
5 or IIIII	Yellow/ Green	Green	Green/ Brown	Brown
6 or IIIIII	Green	Green/ Brown	Brown	Brown/ Black

Smaller bearing (Thicker) ↓

NOTE:
- **When using bearing halves of different colors, it does not matter which color is used in the top or bottom.**
- **Color code is on the edge of the bearing.**

BACK

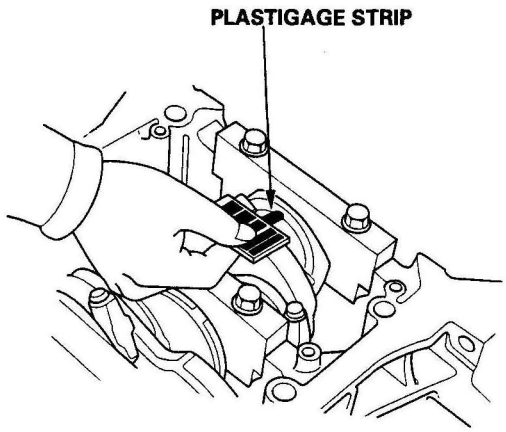
Protected by AR

Connecting Rod Bearing Replacement

Rod Bearing Clearance Inspection

1. Remove the connecting rod cap and bearing half.
2. Clean the crankshaft rod journal and bearing half with a clean shop towel.
3. Place a strip of plastigage across the rod journal.
4. Reinstall the bearing half and cap, and torque the bolts (see step 18 on page 7-25). Do not rotate the crankshaft.
5. Remove the rod cap and bearing half and measure the widest part of the plastigage.

Connecting Rod Bearing-to-Journal Oil Clearance:
Standard (New): 0.020–0.044 mm
(0.0008–0.0017 in.)
Service Limit: 0.050 mm (0.0020 in.)



6. If the plastigage measures too wide or too narrow, remove the upper half of the bearing, install a new, complete bearing with the same color code, and recheck the clearance. Do not file, shim, or scrape the bearings or the caps to adjust clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check clearance again. If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

BACK

Protected by AR

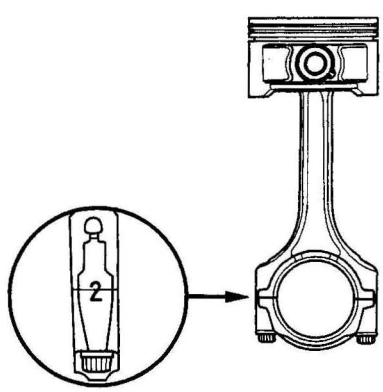
Rod Bearing Selection

Connecting Rod Bore Code Locations

1. Inspect the connecting rod for cracks and heat damage.

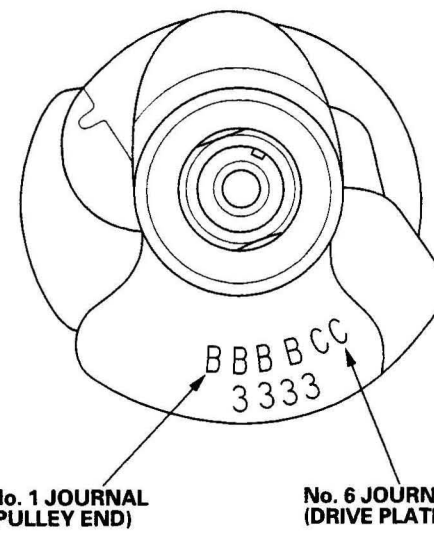
2. Each rod has a tolerance range (from 0 to 0.024 mm (0.0009 in.), in 0.006 mm (0.0002 in.) increments) depending on the size of its big end bore.
   It's then stamped with a code (1, 2, 3, or 4/I, II, III, or IIII) indicating the range.
   You may find any combination of 1, 2, 3, or 4/I, II, III, or IIII in any engine.
   If you cannot read the codes because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.
   Half of the number or bar is stamped on the bearing cap and the other half is stamped on the rod.

Normal Bore Size: 58.0 mm (2.28 in.)



Connecting Rod Journal Code Locations (Letters or Bars)

3. Letters or bars have been stamped on the crankshaft No. 1 web as a code for the rod journal sizes.



4. Use the connecting rod bore codes and journal codes to select the appropriate rod bearings from the table.

Smaller rod Journal	Larger big end bore: 1 or I	2 or II	3 or III	4 or IIII
	Smaller bearing (Thicker)			
A or I	Pink	Pink/ Yellow	Yellow	Yellow/ Green
B or II	Pink/ Yellow	Yellow	Yellow/ Green	Green
C or III	Yellow	Yellow/ Green	Green	Green/ Brown
D or IIII	Yellow/ Green	Green	Green/ Brown	Brown
E or IIIII	Green	Green/ Brown	Brown	Brown/ Black
F or IIIIII	Green/ Brown	Brown	Brown/ Black	Black

Smaller bearing (Thicker)

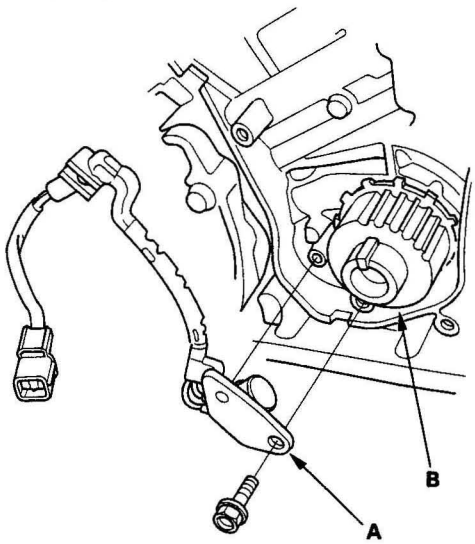
NOTE:
- **When using bearing halves of different colors, it does not matter which color is used in the top or bottom.**
- **Color code is on the edge of the bearing.**

BACK

Protected by AR

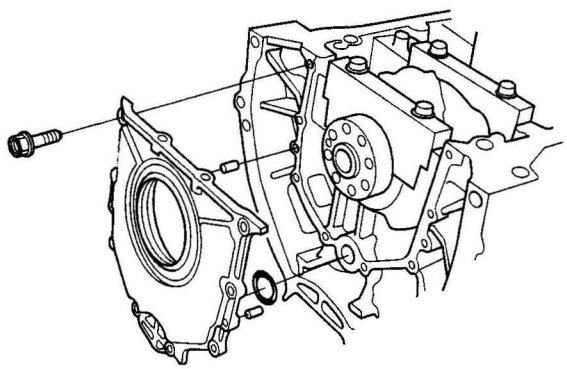
Crankshaft and Piston Removal

1. Remove the crankshaft position (CKP) sensor (A) from the oil pump, then remove the timing belt drive pulley (B).

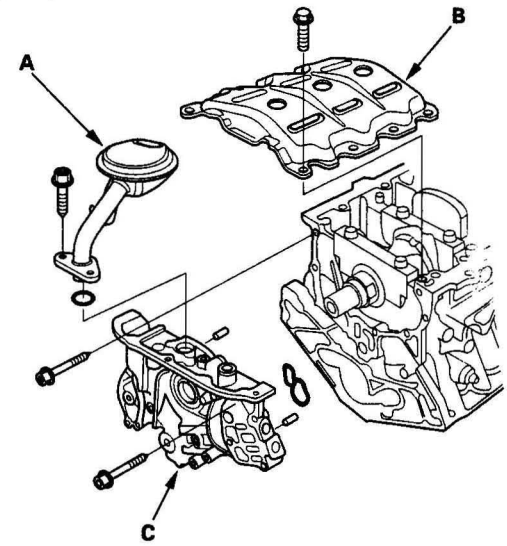


2. Remove the oil pan.

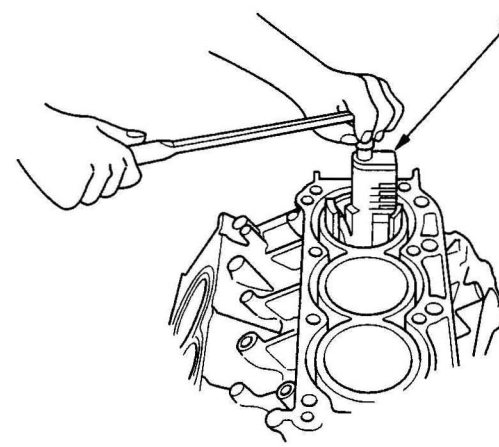
3. Remove the engine block end cover.



4. Remove the oil screen (A), baffle plate (B) and oil pump (C).



5. If you can feel a ridge of metal or hard carbon around the top of any cylinder, remove it with a ridge reamer (A). Follow the reamer manufacturer's instructions. If the ridge is not removed, it may damage the piston as its pushed out.

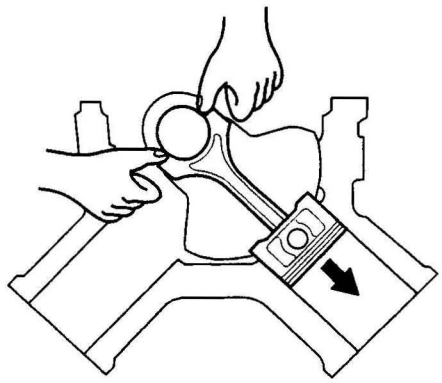


BACK

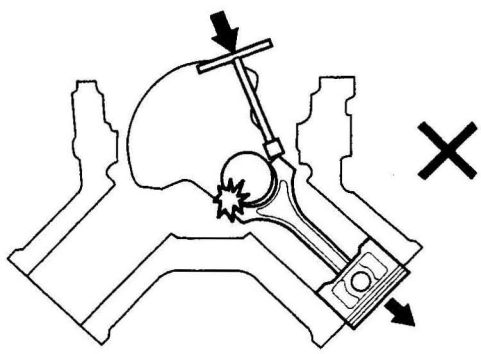
Protected by AR

6. Remove the connecting rod caps after setting the crank pin at bottom dead center (BDC) for each cylinder. Remove the piston assembly by pushing on the connecting rod. Take care not to damage the crank pin or cylinder with the connecting rod.

CORRECT



INCORRECT



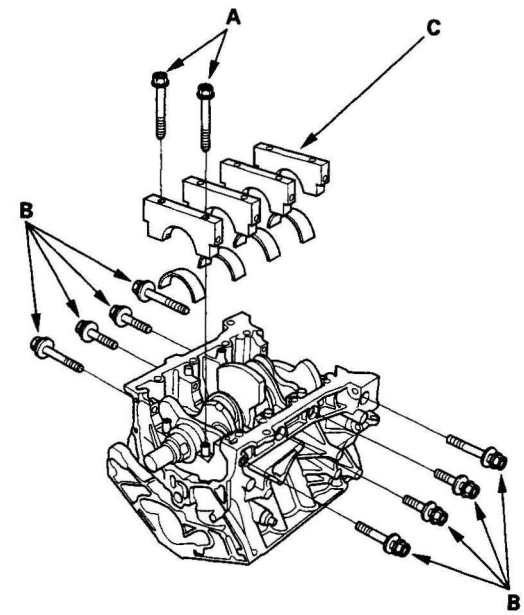
7. Remove the bearing from the cap. Keep all caps/ bearings in order.

8. Remove the upper bearing halves from the connecting rods and set them aside with their respective caps.

9. After removing a piston/connecting rod assembly, reinstall the cap on the rod.

10. To avoid mixup during reassembly, mark each piston/connecting rod assembly with its cylinder number.

11. Remove the bearing cap bolts (A) and bearing cap side bolts (B), then remove the bearing cap (C).



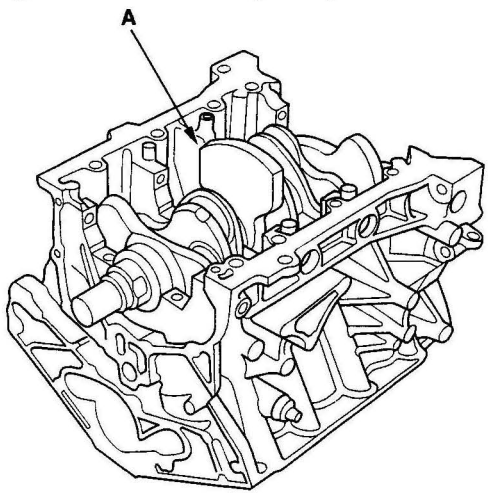
(cont'd)

BACK

Protected by AR

Crankshaft and Piston Removal (cont'd)

12. Lift the crankshaft (A) out of the cylinder block, being careful not to damage the journals.



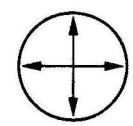
13. Reinstall the main caps and bearings on the cylinder block in the proper order.

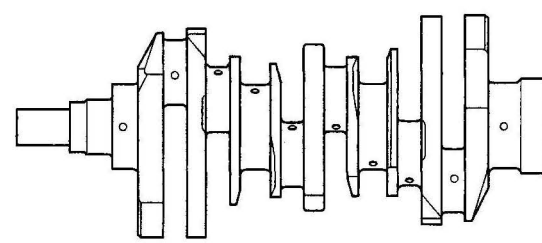
Crankshaft Inspection

Out-of-Round and Taper

1. Remove the crankshaft from the cylinder block (see page 7-12).
2. Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
3. Check the keyway and threads.
4. Measure out-of-round at the middle of each rod and main journal in two places. The difference between measurements on each journal must not be more than the service limit.

Journal Out-of-Round:
Standard (New): 0.005 mm (0.0002 in.) max.
Service Limit: 0.010 mm (0.0004 in.)









5. Measure taper at the edges of each rod and main journal. The difference between measurements on each journal must not be more than the service limit.

Journal Taper:
Standard (New): 0.005 mm (0.0002 in.) max.
Service Limit: 0.010 mm (0.0004 in.)

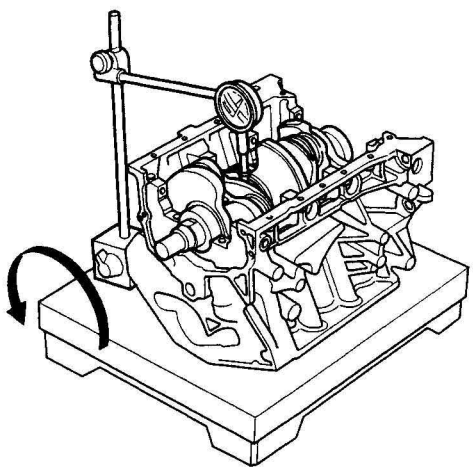
BACK

Protected by AR

Straightness

6. Place the cylinder block on the surface plate.
7. Clean and install the bearings on the No. 1 and No. 4 journal of the cylinder block.
8. Lower the crankshaft into the block.
9. Measure runout on all main journals. Rotate the crankshaft two complete revolutions. The difference between measurements on each journal must not be more that the service limit.

Crankshaft Total Runout:
Standard (New): 0.020 mm (0.0008 in.) max.
Service Limit: 0.030 mm (0.0012 in.)

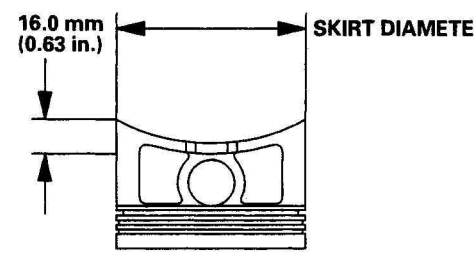


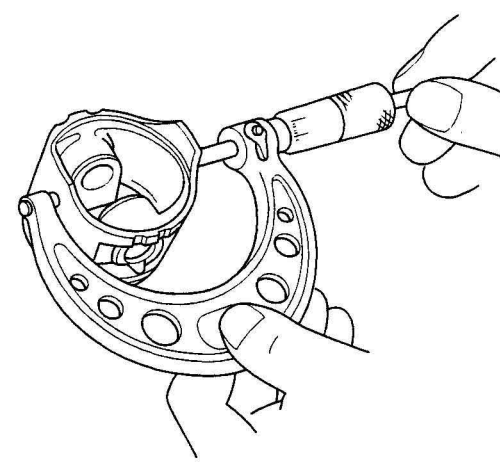
Block and Piston Inspection

1. Remove the piston from the cylinder block (see page 7-12).
2. Check the piston for distortion or cracks.
3. Measure the piston diameter at a point 16.0 mm (0.63 in.) from the bottom of the skirt.

Piston Diameter:
Standard (New): 88.975–88.985 mm (3.5029–3.5033 in.)
Service Limit: 88.965 mm (3.5026 in.)

Oversize Piston Diameter:
0.25: 89.225–89.235 mm (3.5128–3.5132 in.)
0.50: 89.475–89.485 mm (3.5226–3.5230 in.)





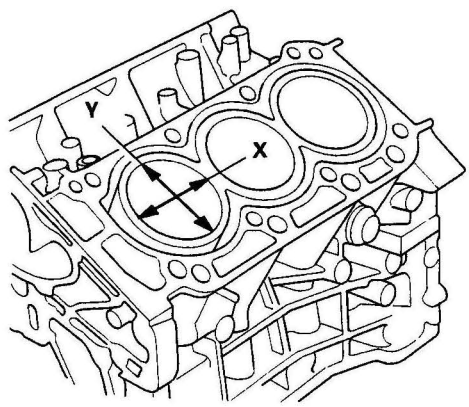
(cont'd)

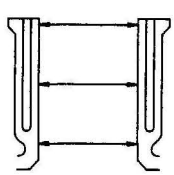
BACK

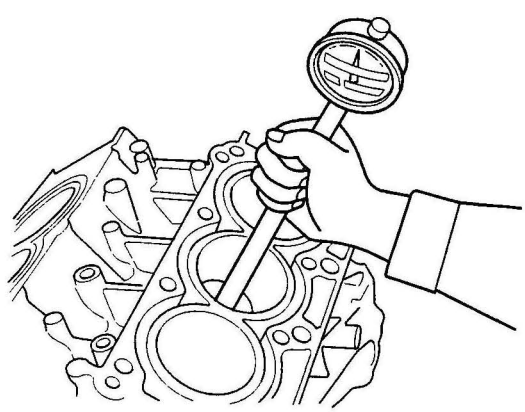
Protected by AR

Block and Piston Inspection (cont'd)

4. Measure wear and taper in directions X and Y at three levels in each cylinder as shown.
   - If the measurements in any cylinder are beyond the oversize bore service limit, replace the cylinder block.
   - If the block is to be rebored, refer to Piston Clearance Inspection (Go to step 6) after reboring.







Cylinder Bore Size:
Standard (New): 89.000–89.015 mm (3.5039–3.5045 in.)
Service Limit: 89.065 mm (3.5065 in)

Oversize
0.25: 89.250–89.265 mm (3.5138–3.5144 in.)
0.50: 89.500–89.515 mm (3.5236–3.5242 in.)

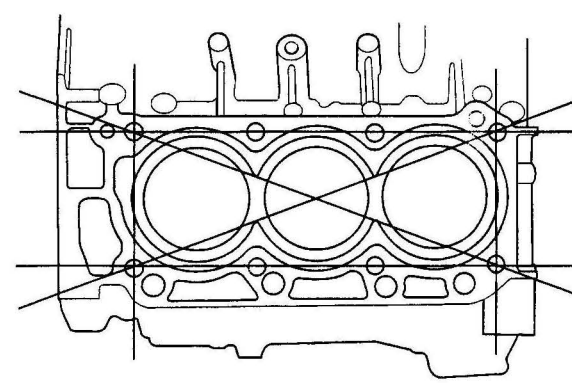
Reboring Limit: 0.5 mm (0.02 in.)

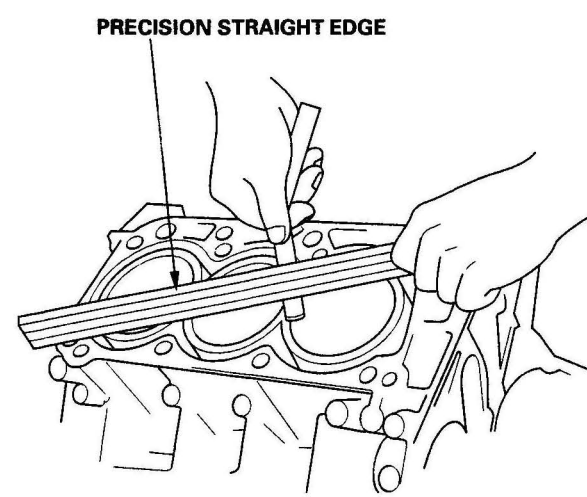
Bore Taper
Limit: (Difference between first and third measurement) 0.05 mm (0.002 in.)

5. Scored or scratched cylinder bores must be honed.

6. Check the top of the cylinder block for warpage. Measure along the edges and across the center as shown.

Cylinder Block Warpage:
Standard (New): 0.07 mm (0.003 in.) max.
Service Limit: 0.10 mm (0.004 in.)



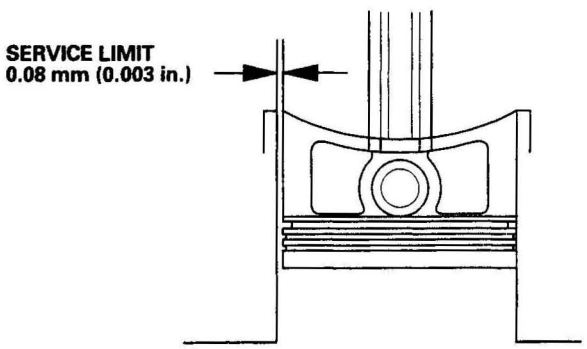


BACK

Protected by AR

7. Calculate the difference between cylinder bore diameter and piston diameter.

Piston-to-Block Clearance:
Standard (New): 0.015–0.040 mm (0.0006–0.0016 in.)
Service Limit: 0.08 mm (0.003 in.)

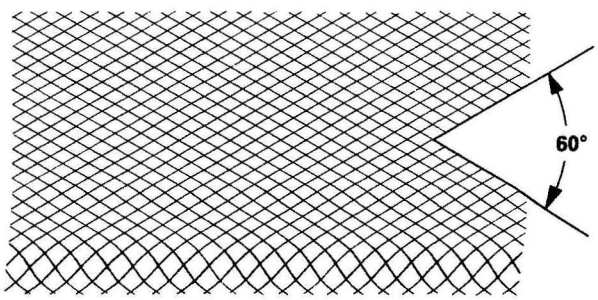


Cylinder Honing

1. Measure the cylinder bores (see step 3 on page 7-15). If the cylinder block is to be reused, hone the cylinders and remeasure the bores. Only scored or scratched cylinder bores must be honed.

2. Hone the cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree crosshatch pattern.

   NOTE:
   - Use only a rigid hone with 400 grit or finer stone, such as Sunnen, Ammco, or equivalent.
   - Do not use stones that are worn or broken.



3. When honing is complete, thoroughly clean the cylinder block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil them immediately to prevent rusting. Never use solvent, it will only redistribute the grit on the cylinder walls.

4. If scoring or scratches are still present in the cylinder bores after honing to the service limit, rebore the cylinder block. Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.

BACK

Protected by AR

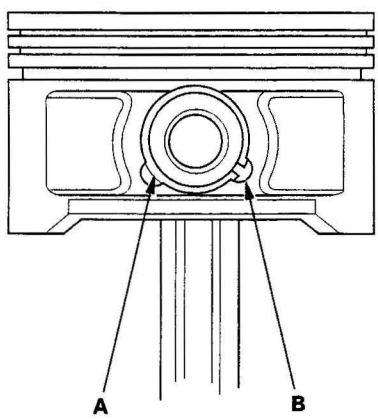
Piston, Pin, and Connecting Rod Replacement

Disassembly

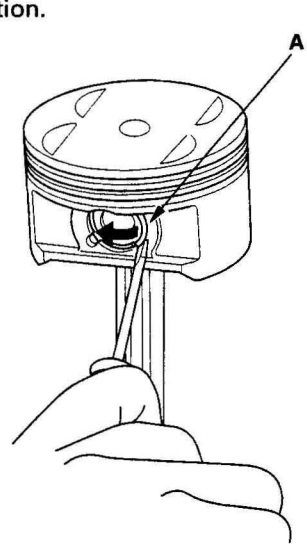
1. Remove the piston from the cylinder block (see page 7-12).

2. Apply engine oil to the piston pin snap rings (A) and turn them in the ring grooves until the end gaps are lined up with the cutouts in the piston pin bores (B).

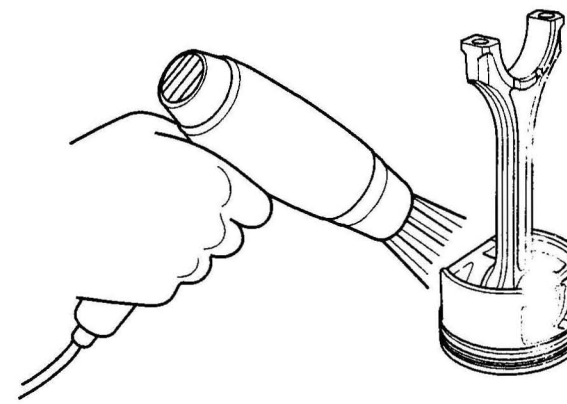
   NOTE: Take care not to damage the ring grooves.



3. Remove both snap rings (A). Start at the cutout in the piston pin bore. Remove the snap rings carefully so they do not go flying or get lost. Wear eye protection.



4. Heat the piston and connecting rod assembly to about 158°F (70°C), then remove the piston pin.



BACK

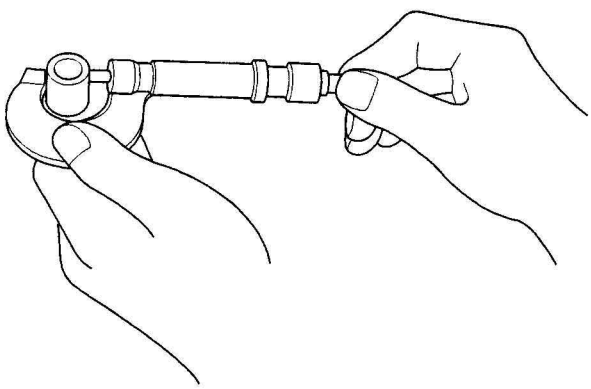
Protected by AR

Inspection

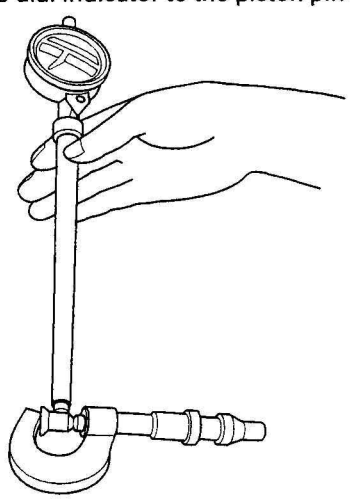
NOTE: Inspect the piston, piston pin and connecting rod when they are at room temperature.

1. Measure the diameter of the piston pin.

Piston Pin Diameter:
Standard (New): 21.962−21.965 mm (0.8646−0.8648 in.)
Service Limit: 21.954 mm (0.8643 in.)

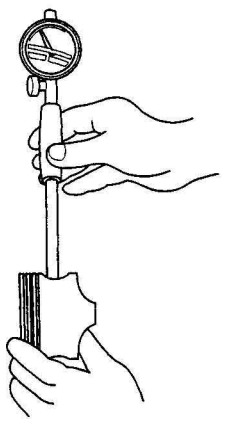


2. Zero the dial indicator to the piston pin diameter.



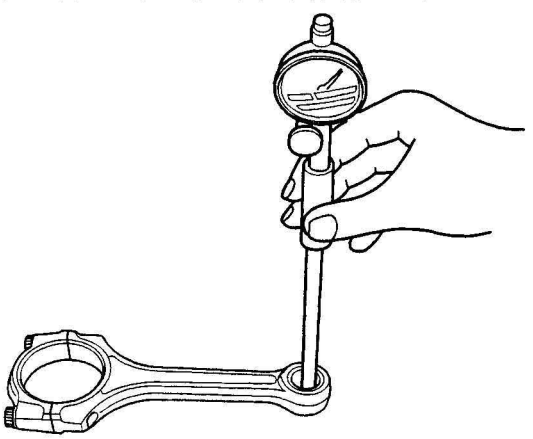
3. Check the difference between the piston pin diameter and piston pin hole diameter on the piston.

Piston Pin-to-Piston Clearance:
Standard (New): −0.0050 to +0.0010 mm (−0.00020 to +0.00004 in.)
Service Limit: 0.004 mm (0.0002 in.)



4. Measure the piston pin-to-connecting rod clearance.

Piston Pin-to-Connecting Rod Clearance:
Standard (New): 0.005−0.014 mm (0.0002−0.0006 in.)
Service Limit: 0.019 mm (0.0007 in.)



(cont'd)

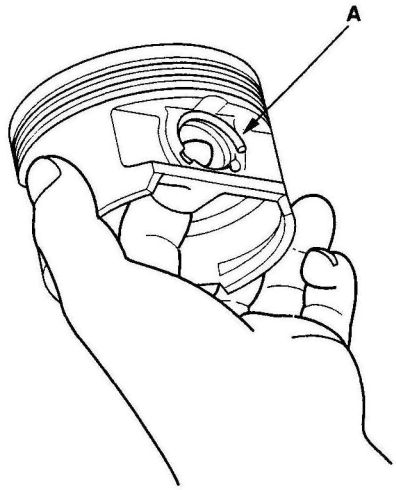
BACK

Protected by AR

Piston, Pin, and Connecting Rod Replacement (cont'd)

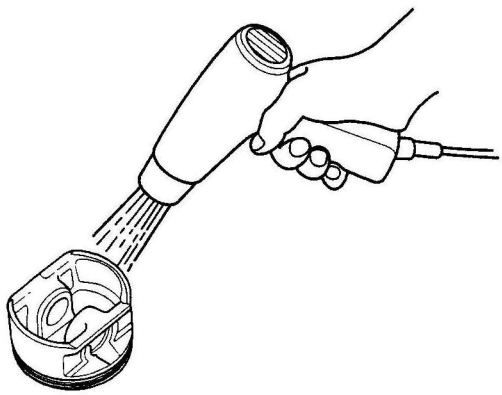
Reassembly

1. Install a piston pin snap ring (A).

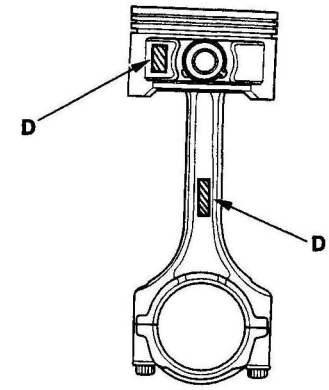


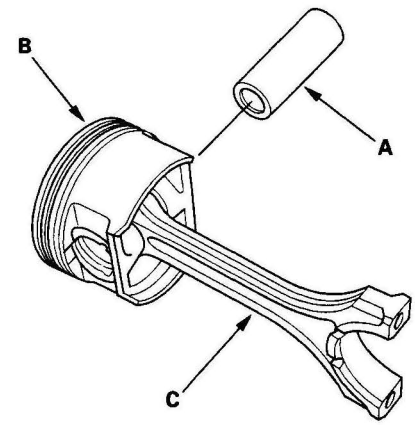
2. Coat the piston pin bore in the piston, the bore in the connecting rod, and the piston pin with engine oil.

3. Heat the piston to about 158°F (70°C).



4. Install the piston pin (A). Assemble the piston (B) and connecting rod (C) with the embossed marks (D) on the same side.





5. Install the remaining snap ring.

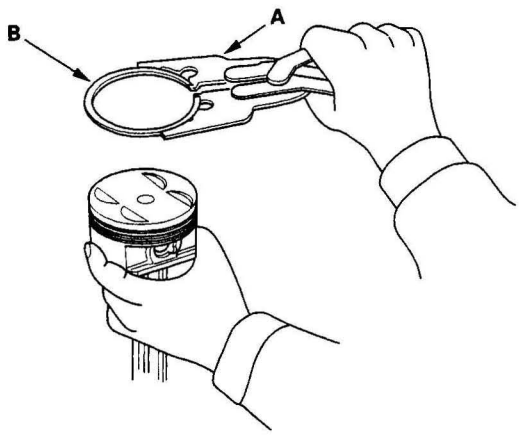
BACK

Protected by AR

Piston Ring Replacement

1. Remove the piston from the cylinder block (see page 7-12).

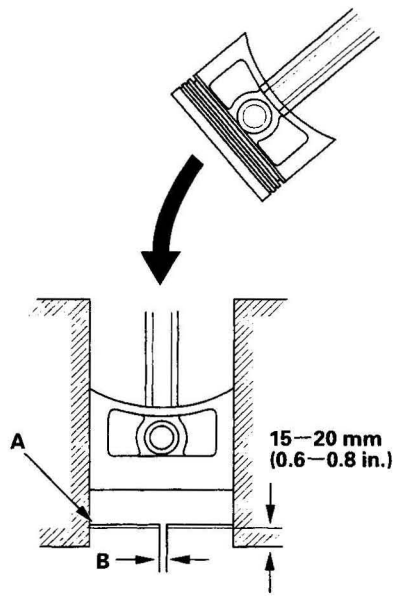
2. Using a ring expander (A), remove the old piston rings (B).



3. Clean all the ring grooves throughly with a squared-off broken ring or ring groove cleaner with a blade to fit the piston grooves. File down the blade if necessary. Top ring and second ring grooves are 1.2 mm (0.05 in.) wide, and the oil ring groove is 2.8 mm (0.11 in.) wide. Do not use a wire brush to clean the ring grooves, or cut the ring grooves deeper with the cleaning tool.

   NOTE: If the piston is to be separated from the connecting rod, do not install new rings yet.

4. Using a piston, push a new ring (A) into the cylinder bore 15—20 mm (0.6—0.8 in.) from the bottom.



5. Measure the piston ring end-gap (B) with a feeler gauge:

   - If the gap is too small, check to see if you have the proper rings for your engine.
   - If the gap is too large, recheck the cylinder bore diameter against the wear limits (see step 4 on page 7-16).
     If the bore is over the service limit, the cylinder block must be rebored.

Piston Ring End-Gap:

Top Ring
Standard (New): 0.20—0.35 mm (0.008—0.014 in.)
Service Limit: 0.60 mm (0.024 in.)

Second Ring
Standard (New): 0.40—0.55 mm (0.016—0.022 in.)
Service Limit: 0.70 mm (0.028 in.)

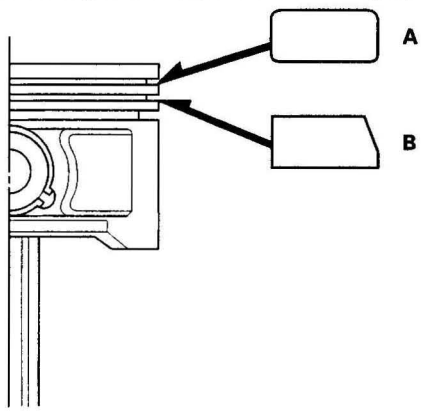
Oil Ring
Standard (New): 0.20—0.70 mm (0.008—0.028 in.)
Service Limit: 0.80 mm (0.031 in.)

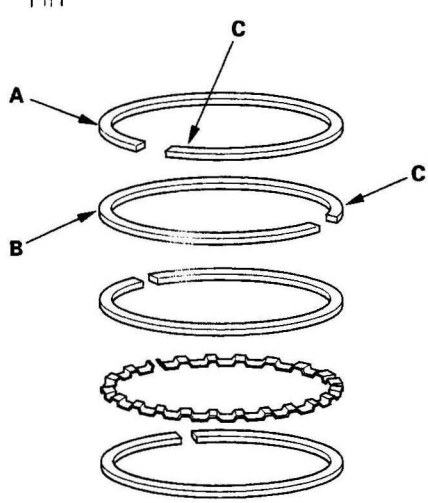
(cont'd)

Protected by AR

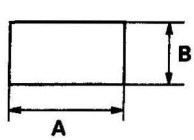
Piston Ring Replacement (cont'd)

6. Install the rings as shown. The top ring (A) has a 1C mark (J32A1 engine) or 1D mark (J32A2 engine) and the second ring (B) has a 2C mark. The manufacturing marks (C) must be facing upward.





Piston Ring Dimensions:

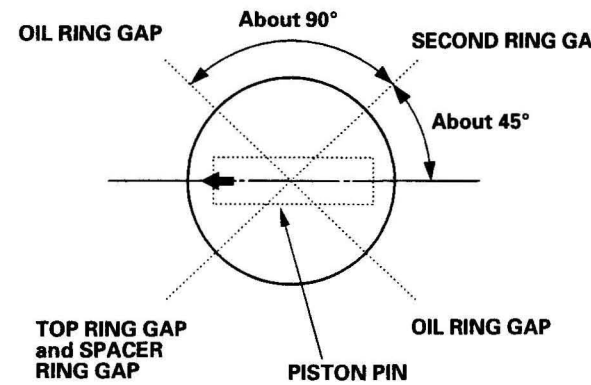


Top Ring (Standard)
A: 3.1 mm (0.12 in.)
B: 1.2 mm (0.05 in.)

Second Ring (Standard)
A: 3.4 mm (0.13 in.)
B: 1.2 mm (0.05 in.)

7. Rotate the rings in their grooves to make sure they do not bind.

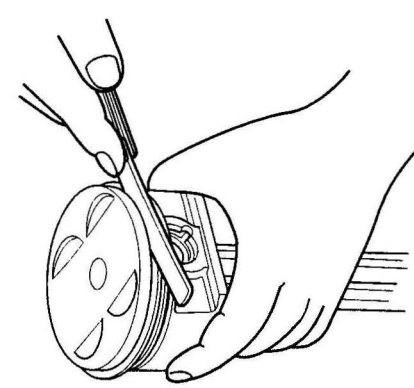
8. Position the ring end gaps as shown:



9. After installing a new set of rings, measure the ring-to-groove clearance:

Top Ring Clearance
J32A1 engine:
Standard (New): 0.035–0.060 mm (0.0014–0.0024 in.)
Service Limit: 0.13 mm (0.005 in.)
J32A2 engine:
Standard (New): 0.055–0.080 mm (0.0022–0.0031 in.)
Service Limit: 0.13 mm (0.005 in.)

Second Ring Clearance
Standard (New): 0.030–0.055 mm (0.0012–0.0022 in.)
Service Limit: 0.13 mm (0.005in.)



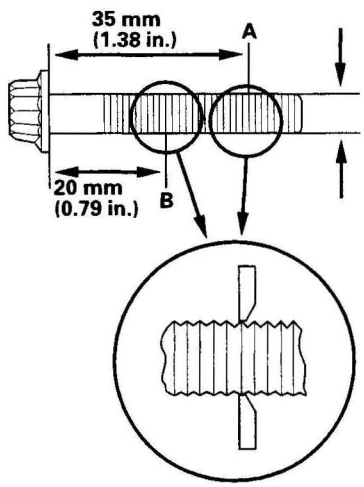
BACK

Protected by AR

Crankshaft and Piston Installation

Special Tools Required
- Driver 07749-0010000
- Oil Seal Driver Attachment, 80 mm I.D. 07VAD-P8A010A

1. Measure the diameter of each connecting rod bolt at point A and point B.



2. Calculate the difference in diameter between point A and point B.

   Point A − Point B = Difference in Diameter

   Difference in Diameter:
   Specification: 0 − 0.1 mm (0 − 0.004 in.)

3. If the difference in diameter is out of tolerance, replace the connecting rod bolt.

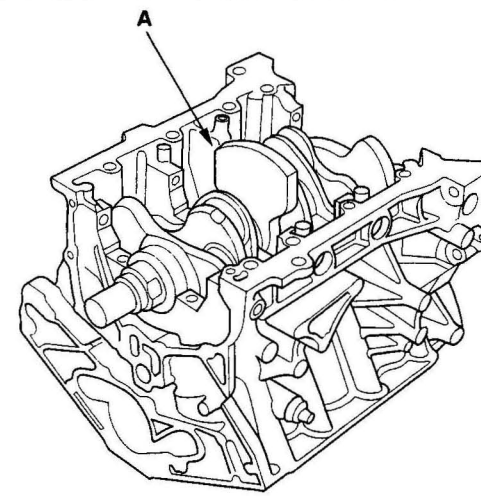
4. Check the connecting rod bearing clearance with plastigage (see page 7-10).

5. Check the main bearing clearance with plastigage (see page 7-8).

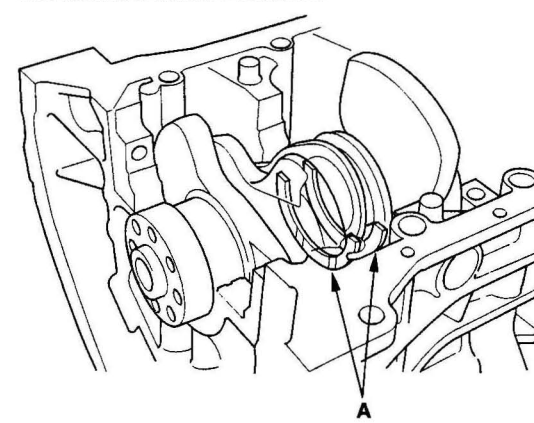
6. Install the bearing halves in the cylinder block and connecting rods.

7. Apply engine oil to the main bearings and rod bearings.

8. Lower the crankshaft (A) into the block.



9. Install the thrust washers (A) in the No. 3 journal.Oil the thrust washer surfaces.



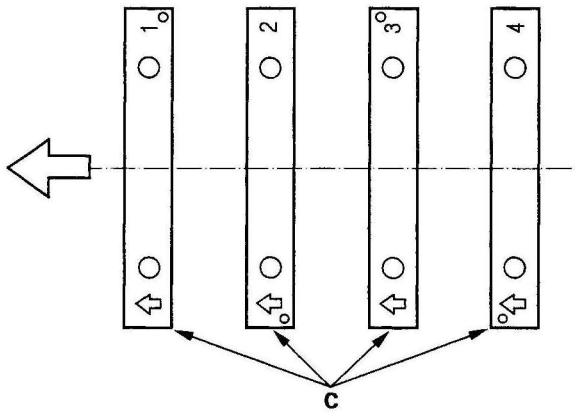
(cont'd)

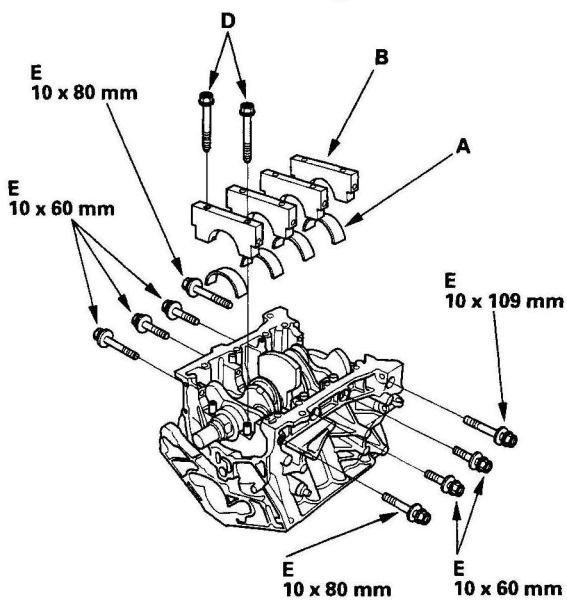
BACK

Protected by AR

Crankshaft and Piston Installation (cont'd)

10. Install the bearings (A) and bearing caps (B) with the arrow (C) facing the timing belt end of the engine.



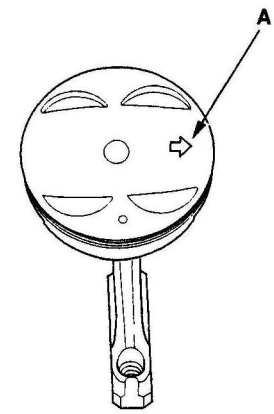


11. Apply engine oil to the bolt threads and flange, then install the bearing cap bolts (D) and bearing cap side bolts (E).

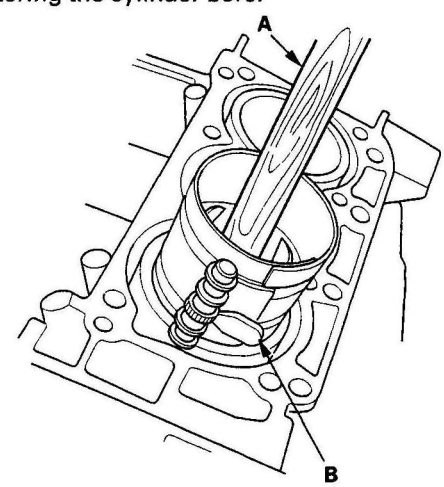
12. Set the crankshaft to bottom dead center (BDC) for the cylinder you are working on.

13. Remove the connecting rod caps. Install the ring compressor, and check that the bearing is securely in place.

14. Install the piston with the arrow (A) facing the timing belt side of the engine.



15. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer (A). Maintain downward force on the ring compressor (B) to prevent the rings from expanding before entering the cylinder bore.



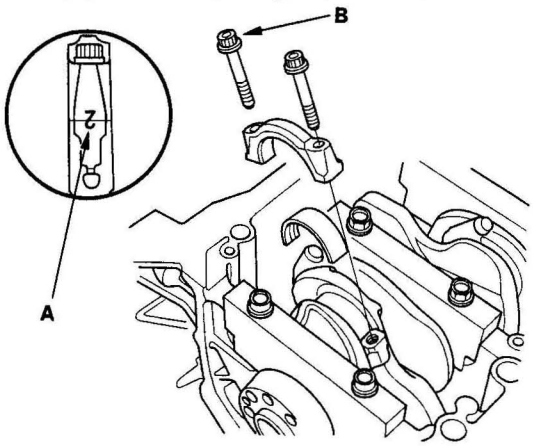
16. Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing the piston into place.

BACK

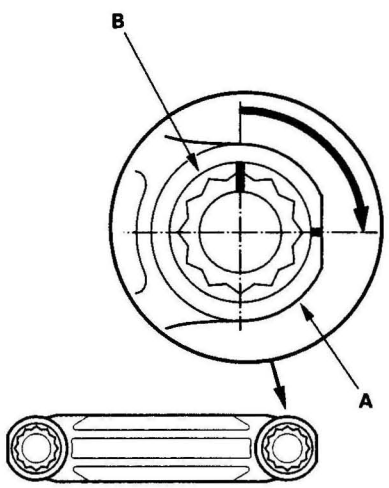
Protected by AR

17. Line up the mark (A) on the connecting rod and cap, then install the cap.

18. Apply engine oil to the bolt threads. Torque the bolts (B) to 20 N·m (2.0 kgf·m, 14 lbf·ft).



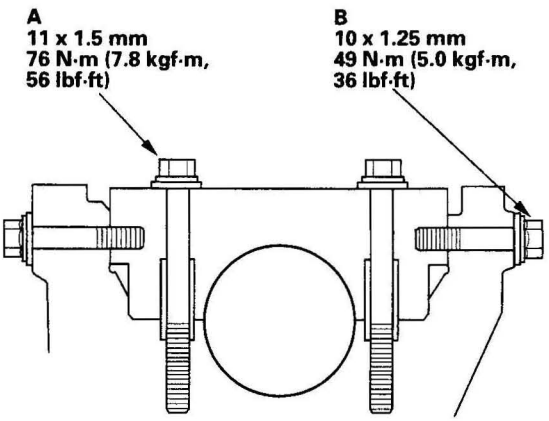
19. Mark the connecting rod (A) and bolt head (B) as shown.

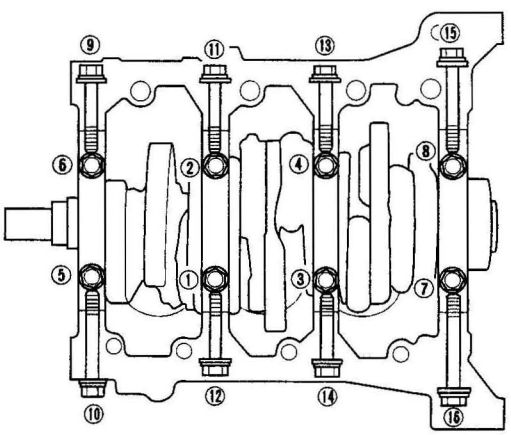


20. Tighten the bolt until the mark on the bolt head lines up with the mark on the connecting rod (turn the bolt 90°).

21. Torque the bearing cap bolts (A), then torque the bearing cap side bolts (B). Follow the numbered sequence shown.

NOTE: Whenever any crankshaft or connecting rod bearing is replaced, it is necessary after reassembly to run the engine at idling speed until it reaches normal operating temperature, then continue to run it for approximately 15 minutes.





(cont'd)

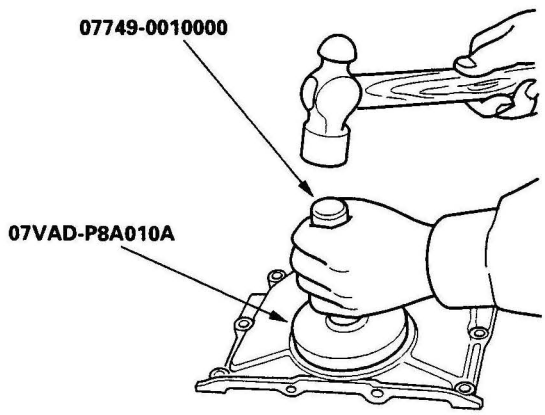
BACK

Protected by AR

Crankshaft and Piston Installation (cont'd)

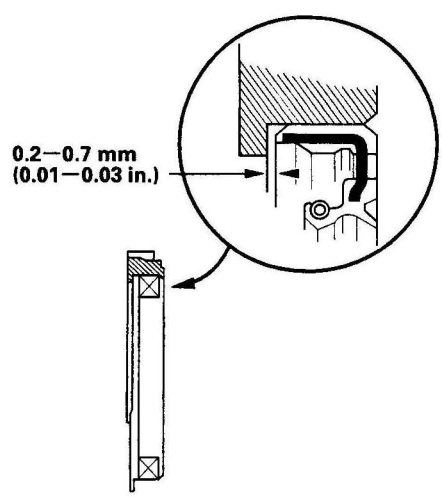
22. The seal mating surface on the engine block end cover should be dry. Apply a light coat of grease to the crankshaft and to the lip of the seal.

23. Drive the crankshaft oil seal squarely into the engine block end cover.



24. Confirm that the clearance is equal all the way around with a feeler gauge.

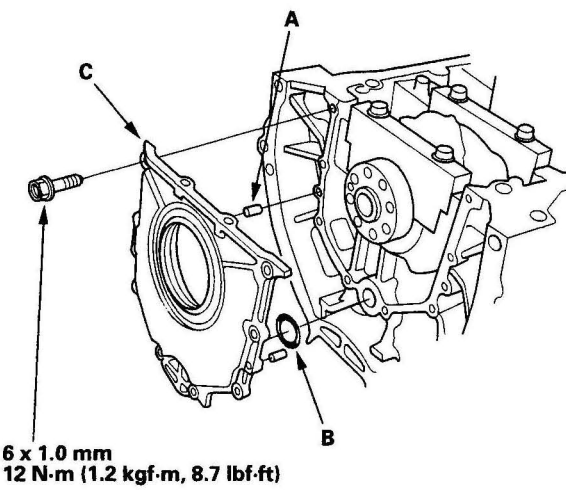
Clearance: 0.2—0.7 mm (0.01—0.03 in.)



25. Clean and dry the engine block end cover mating surfaces.

26. Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the block mating surface of the engine block end cover and to the inner threads of the bolt holes. Install the dowel pins (A), new O-ring (B) and the left side cover (C) on the cylinder block.

NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.



27. After assembly, wait at least 30 minutes before filling the engine with oil.

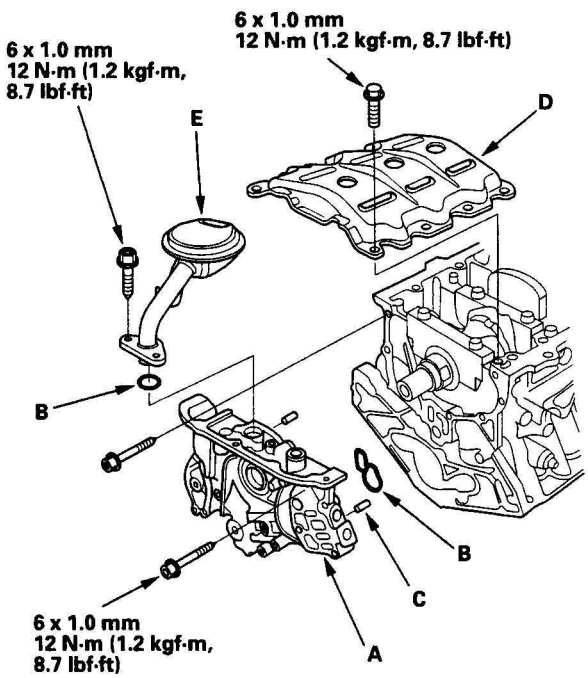
BACK

Protected by AR

28. Clean and dry the oil pump mating surfaces.

29. Install the oil pump (A).

–1 Install a new crankshaft oil seal in the oil pump (see step 15 on page 8-9).
–2 Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the block mating surface of the oil pump and to the inner threads of the bolt holes.
NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.
–3 Grease the lip of the oil seal and apply oil to the new O-ring (B).
–4 Install the dowel pins (C), then align the inner rotor with the crankshaft and install the oil pump.
–5 Clean the excess grease off the crankshaft and check the seal for distortion.

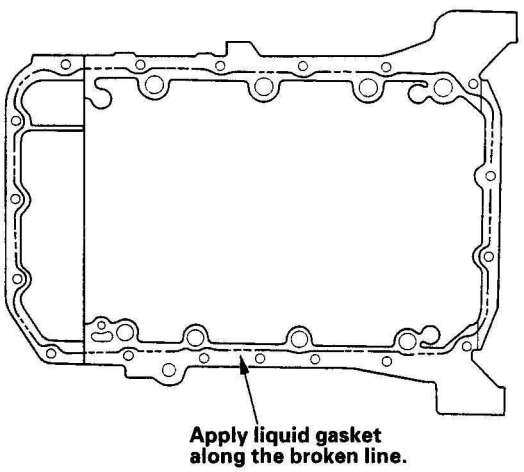


30. Install the baffle plate (D), then install the oil screen (E).

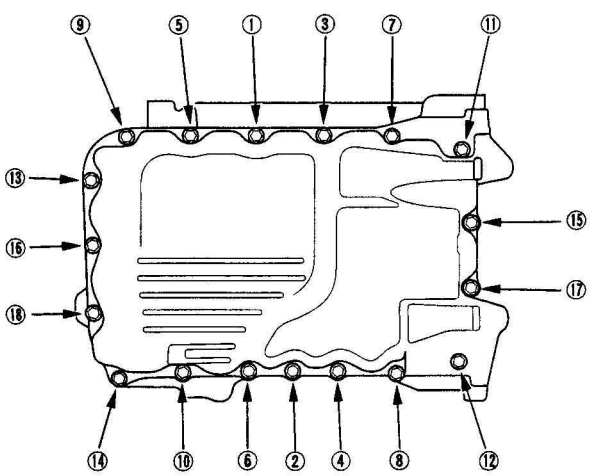
31. Clean and dry the oil pan mating surfaces.

32. Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the oil pan mating surface of the block and to the inner threads of the bolt holes.
NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.

33. Install the oil pan.



34. Tighten the bolts in two or three steps. In the final step, tighten all bolts, in sequence, to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).

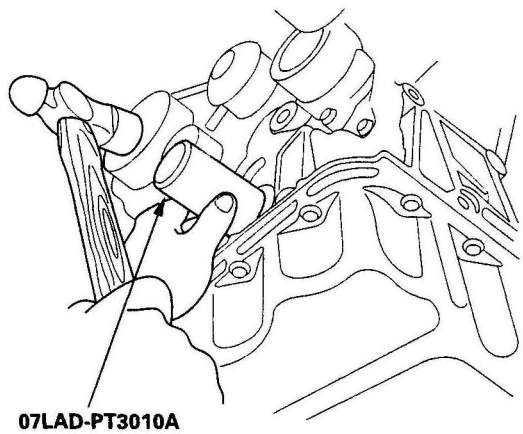


Protected by AR

Pulley End Crankshaft Seal Installation - In-car

Special Tools Required
Oil Seal Driver 07LAD-PT3010A

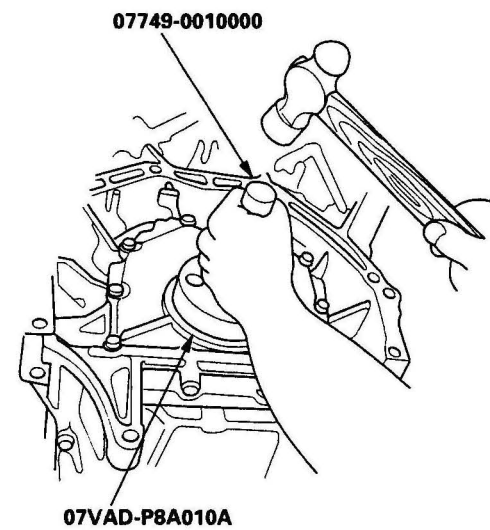
1. Dry the crankshaft oil seal housing.
2. Apply a light coat of grease to the crankshaft and to the lip of the seal.
3. Using the seal driver, drive in the crankshaft oil seal until the driver bottoms against the oil pump. When the seal is in place, clean any excess grease off the crankshaft, and check that the oil seal lip is not distorted.



Transmission End Crankshaft Seal Installation - In-car

Special Tools Required
- Driver 07749-0010000
- Oil Seal Driver Attachment, 80 mm I.D. 07VAD-P8A010A

1. Dry the crankshaft oil seal housing.
2. Apply a light coat of grease to the crankshaft and to the lip of the seal.
3. Using the special tools, drive the crankshaft oil seal into the engine block end cover until the driver attachment bottoms against the crankshaft. Align the hole in the driver attachment with the pin on the crankshaft.

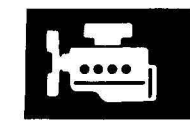


4. Clean any excess grease off the crankshaft, and check that the oil seal lip is not distorted.

BACK

Protected by AR

Engine Mechanical



Engine Lubrication

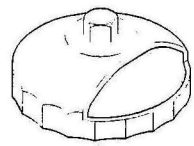
Special Tools 8-2
Component Location Index 8-3
Oil Pressure Switch Test 8-4
Oil Pressure Test 8-4
Engine Oil Replacement 8-5
Engine Oil Filter Replacement 8-5
Oil Pump Overhaul 8-7

Protected by AR

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07GAD-PH70201	Oil Seal Driver	1
②	07912-6110001	Oil Filter Wrench	1

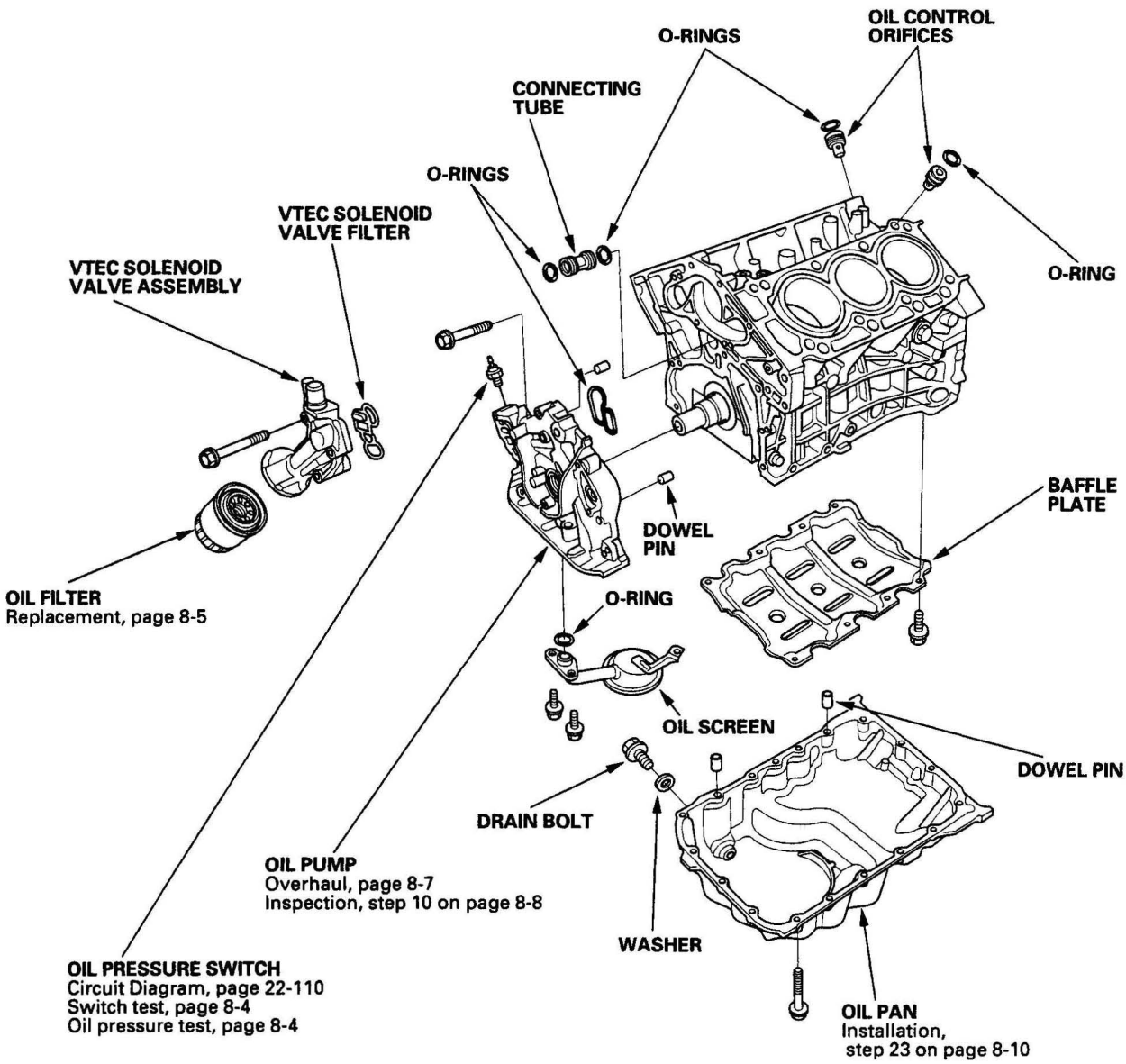




BACK

Protected by AR

Component Location Index

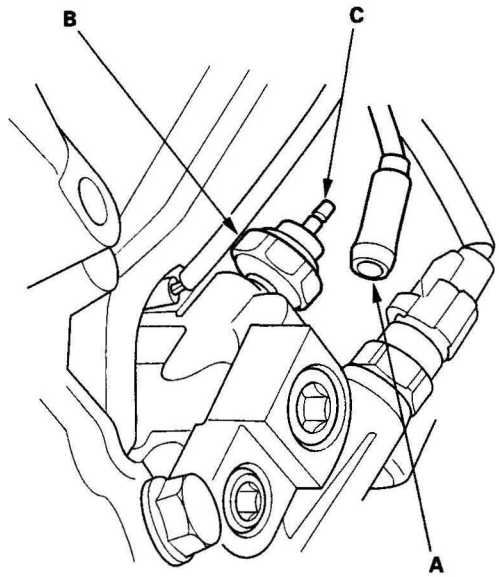


BACK

Protected by AR

Oil Pressure Switch Test

1. Remove the YEL/RED wire (A) from the engine oil pressure switch (B).

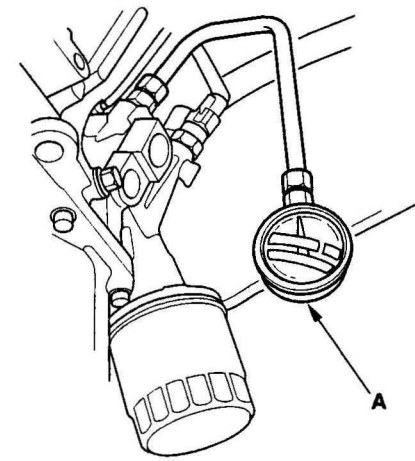


2. Check for continuity between the positive terminal (C) and the engine (ground). There should be continuity with the engine stopped. There should be no continuity with the engine running.

Oil Pressure Test

If the oil pressure warning light stays on with the engine running, check the engine oil level. If the oil level is correct:

1. Connect a tachometer.
2. Remove the engine oil pressure switch and install an oil pressure gauge (A).



3. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.
4. Allow the engine to reach operating temperature (fan comes on at least twice). The pressure should be:

Engine Oil Temperature: 176°F (80°C)
Engine Oil Pressure:
At Idle: 70 kPa (0.7 kgf/cm², 10 psi) minimum
At 3,000 rpm: 490 kPa (5.0 kgf/cm², 71 psi) minimum

5. If oil pressure is NOT within specifications, inspect these items:

- Check the oil screen for clogging.
- Check the oil pump (see page 8-7).

BACK

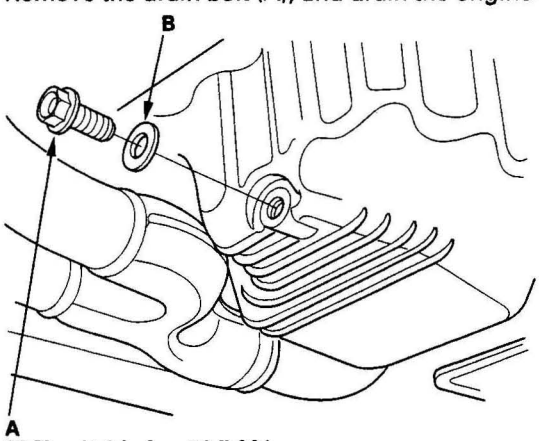
Protected by AR

Engine Oil Replacement

NOTE: Under normal conditions, the oil filter should be replaced at every other oil change. Under severe conditions, the oil filter should be replaced at each oil change.

Change interval:
Every 7,500 miles (12,000 km) or 12 months (Normal conditions)
Every 3,750 miles (6,000 km) or 6 months (Severe conditions).

1. Warm up the engine.
2. Remove the drain bolt (A), and drain the engine oil.



39 N·m (4.0 kgf·m, 29 lbf·ft)
Do not overtighten.

3. Reinstall the drain bolt with a new washer (B).
4. Refill with the recommended oil (see page 3-2).

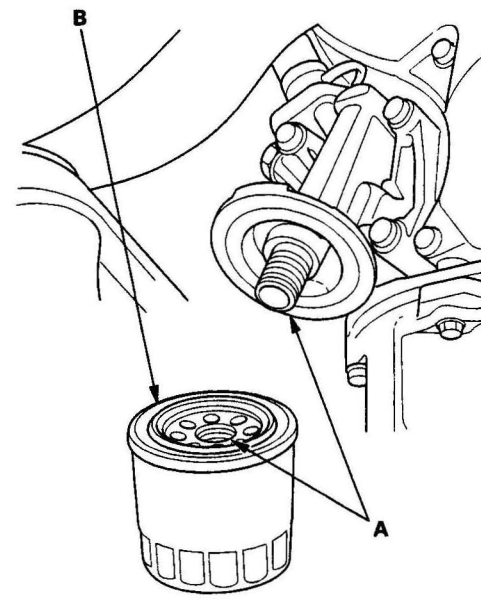
Capacity
4.0 ℓ (4.2 US qt, 3.5 Imp qt) at oil change.
4.4 ℓ (4.6 US qt, 3.9 Imp qt) at oil change including filter.
5.0 ℓ (5.3 US qt, 4.4 Imp qt) after engine overhaul.

5. Run the engine for more than 3 minutes, then check for oil leakage.

Engine Oil Filter Replacement

Special Tools Required
Oil Filter Wrench 07912-6110001

1. Remove the oil filter with the special oil filter wrench.
2. Inspect the threads (A) and rubber seal (B) on the new filter. Wipe off the seat on the engine block, then apply a light coat of oil to the filter rubber seal. Use only filters with a built-in bypass system.



(cont'd)

BACK

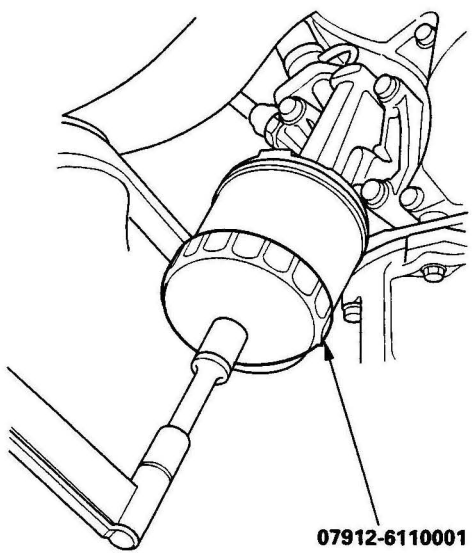
Protected by AR

Engine Oil Filter Replacement (cont'd)

3. Install the oil filter by hand.

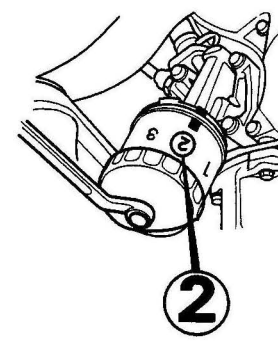
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

   Tighten: 7/8 turn clockwise.
   Tightening torque: 22 N·m (2.2 kgf·m, 16 lbf·ft)

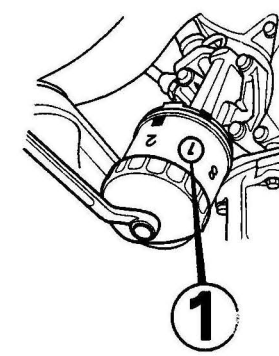


5. If eight numbers (1 to 8) are printed around the outside of the filter, use the following procedure to tighten the filter.

   - Spin the filter on until its seal lightly seats against the block, and note which number is at the bottom.
   - Tighten the filter by turning it clockwise seven numbers from the one you noted. For example, if number 2 is at the bottom when the seal is lightly seated, tighten the filter until the number 1 comes around to the bottom.



Number when rubber seal is seated.



Number after tightening.

Number when rubber seal is seated	1	2	3	4	5	6	7	8
Number after tightening	8	1	2	3	4	5	6	7

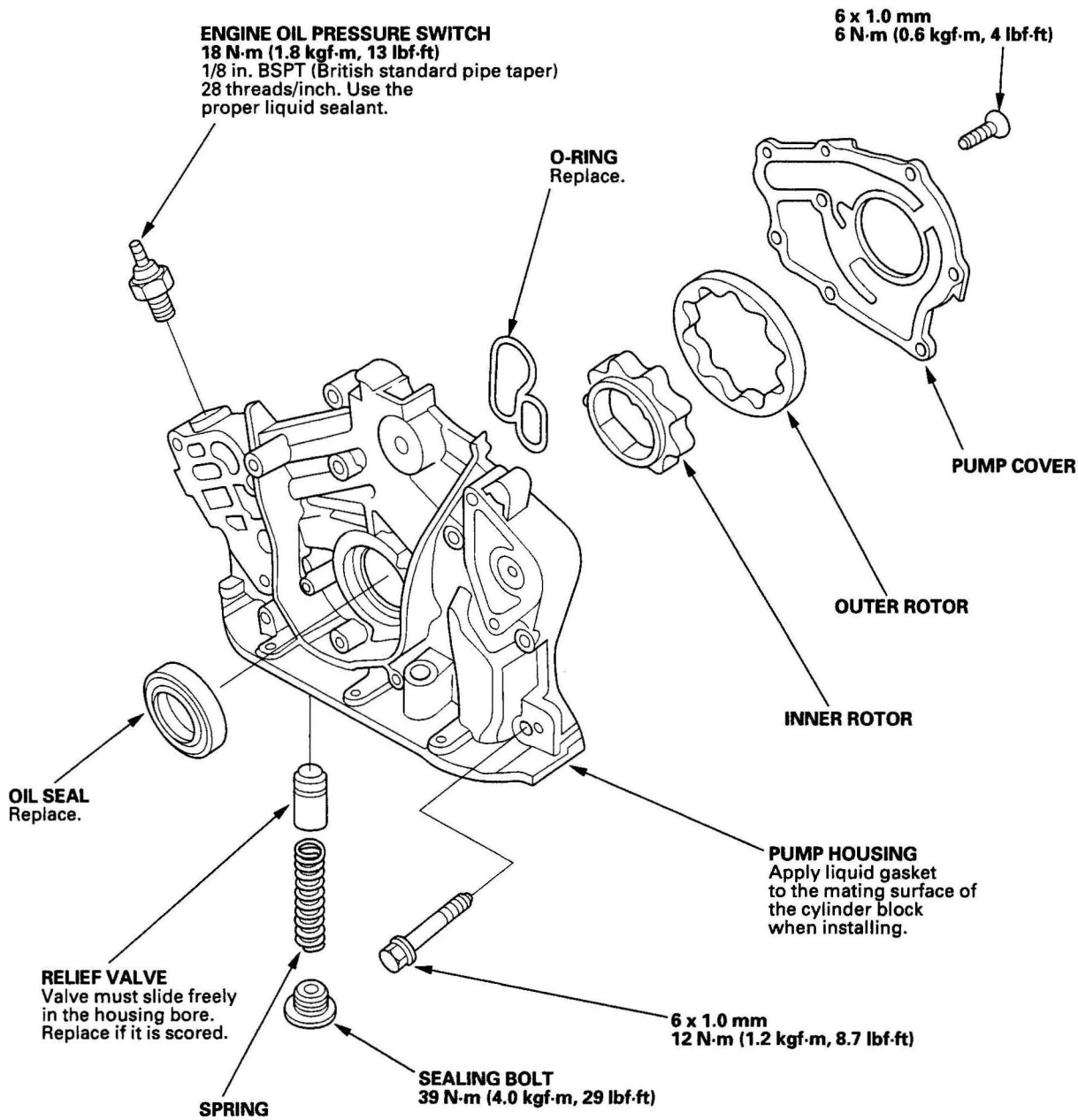
6. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

BACK

Protected by AR

Oil Pump Overhaul

Exploded View



(cont'd)

BACK

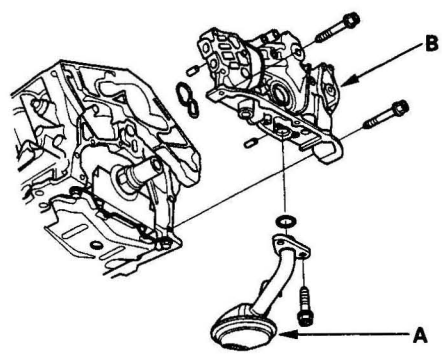
Protected by AR

Oil Pump Overhaul (cont'd)

Special Tools Required
Oil Seal Driver 07GAD-PH70201

Removal

1. Drain the engine oil.
2. Turn the crankshaft so that the No. 1 piston is at top dead center (see page 6-18).
3. Remove the timing belt (see page 6-18).
4. Remove the idler pulley.
5. Remove the crankshaft position (CKP) sensor, then remove the timing belt drive pulley (see page 6-60).
6. Remove the VTEC solenoid valve and oil filter assembly (see page 6-9).
7. Remove the oil pan and the oil screen (A).

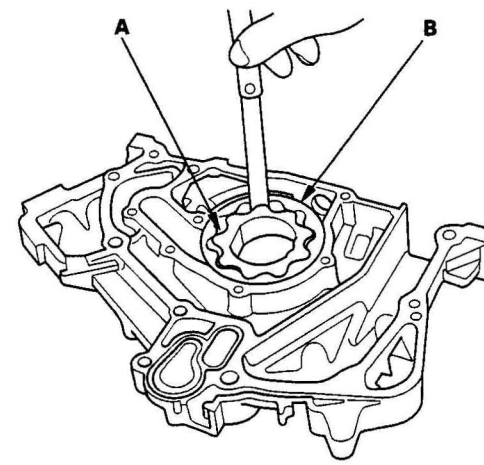


8. Remove the mounting bolts and the oil pump assembly (B).
9. Remove the screws from the pump housing, then separate the housing and cover.

Inspection

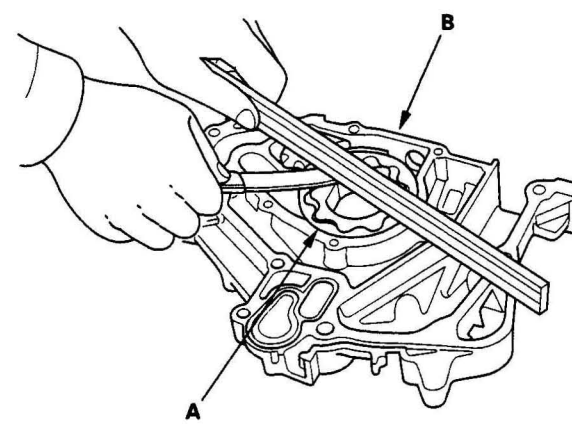
10. Check the inner-to-outer rotor radial clearance between the inner rotor (A) and outer rotor (B). If the inner-to-outer rotor clearance exceeds the service limit, replace the oil pump assembly.

Inner Rotor-to-Outer Rotor Radial Clearance
Standard (New): 0.04–0.16 mm (0.002–0.006 in.)
Service Limit: 0.20 mm (0.008 in.)



11. Check the housing-to-rotor axial clearance between the rotors (A) and pump housing (B). If the housing-to-rotor axial clearance exceeds the service limit, replace the oil pump assembly.

Housing-to-Rotor Axial Clearance
Standard (New): 0.02–0.07 mm (0.001–0.003 in.)
Service Limit: 0.12 mm (0.005 in.)

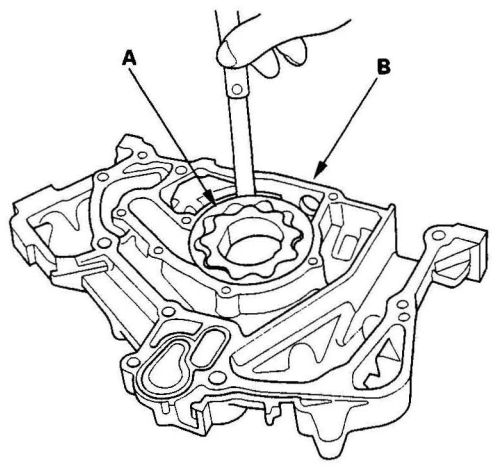


BACK

Protected by AR

12. Check the housing-to-outer rotor radial clearance between the outer rotor (A) and pump housing (B). If the housing-to-outer rotor radial clearance exceeds the service limit, replace the oil pump assembly.

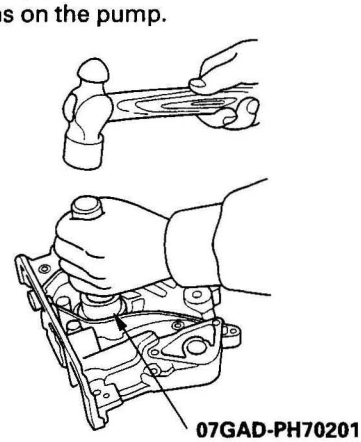
Housing-to-Outer Rotor Radial Clearance
Standard (New): 0.14–0.19 mm (0.006–0.007 in.)
Service Limit: 0.20 mm (0.008 in.)



13. Inspect both rotors and the pump housing for scoring or other damage. Replace parts if necessary.

14. Remove the old oil seals from the oil pump.

15. Gently tap in the new oil seals until the special tool bottoms on the pump.



16. Apply liquid thread lock to the pump housing screws.

Installation

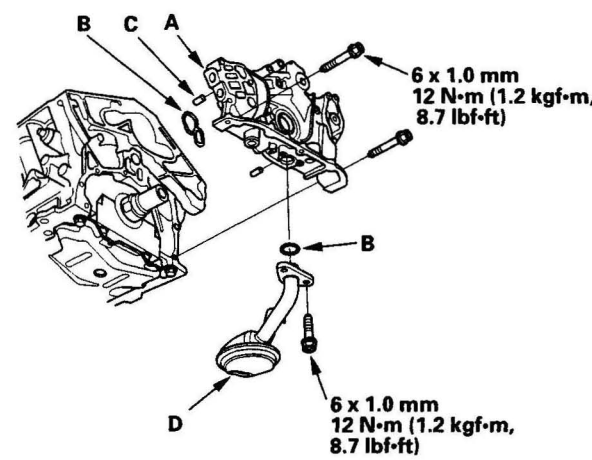
17. Reassemble the oil pump.

18. Check that the oil pump turns freely.

19. Clean and dry the oil pump mating surfaces.

20. Install the oil pump (A).

    –1 Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the block mating surface of the oil pump and to the inner threads of the bolt holes.
    NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.
    –2 Grease the lip of the oil seal and apply oil to the new O-rings (B).
    –3 Install the dowel pins (C), then align the inner rotor with the crankshaft and install the oil pump.
    –4 Clean the excess grease off the crankshaft, and check the seal for distortion.



21. Install the oil screen (D).

(cont'd)

BACK

Protected by AR

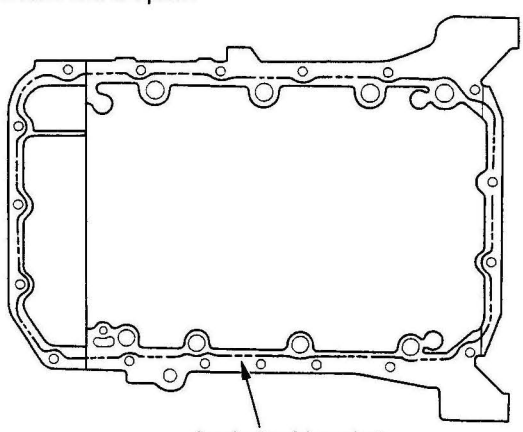
Oil Pump Overhaul (cont'd)

22. Clean and dry the oil pan mating surfaces.

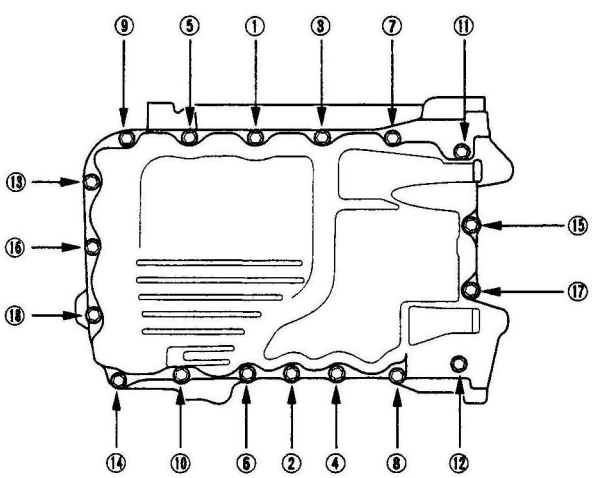
23. Apply liquid gasket, part No. 08718-0001 or 08718-0003, evenly to the oil pan mating surface of the block and to the inner threads of the bolt holes.

    NOTE: Do not install the parts if 5 minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.

24. Install the oil pan.



25. Tighten the bolts in two or three steps. In the final step, tighten all bolts, in sequence to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).



BACK

Protected by AR

Engine Mechanical



Intake Manifold and Exhaust System

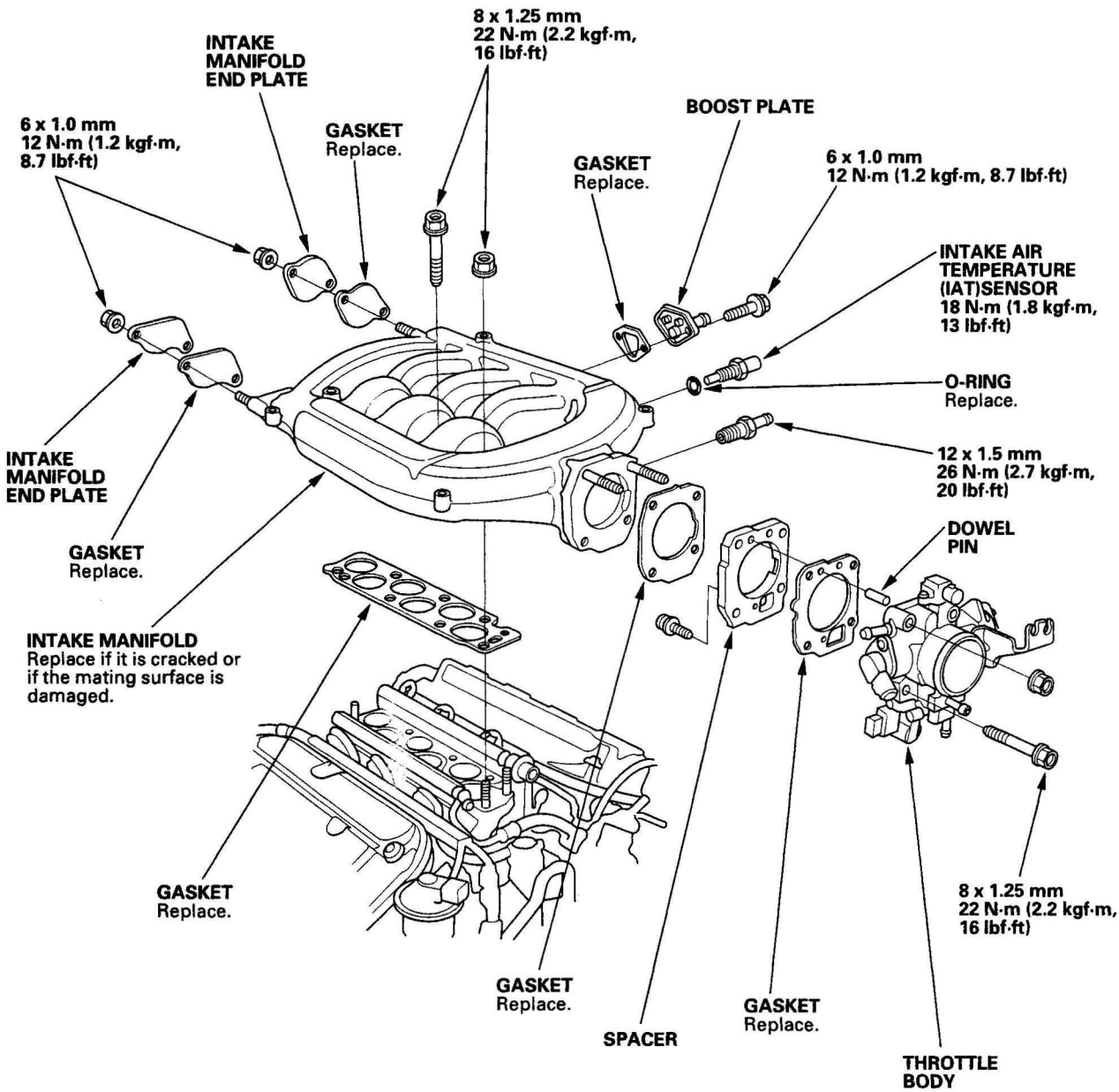
Intake Manifold Removal and Installation 9-2
Exhaust Manifold Removal and Installation 9-11
Exhaust Pipe and Muffler Replacement 9-12

Protected by AR

Intake Manifold and Exhaust System

Intake Manifold Removal and Installation

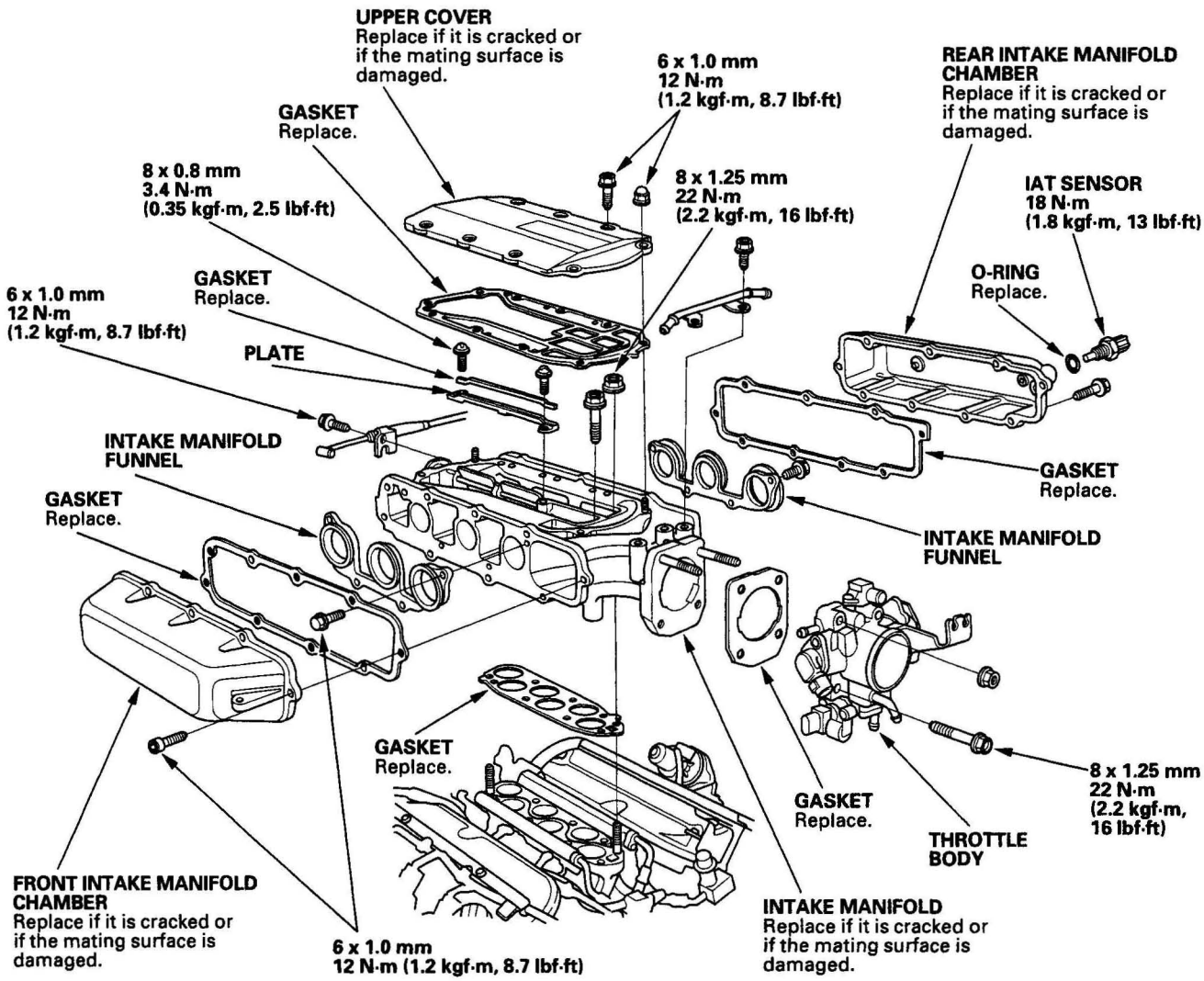
Exploded View—J32A1 engine ('99 model):



BACK

Protected by AR

Exploded View—J32A1 engine ('00-03 models):



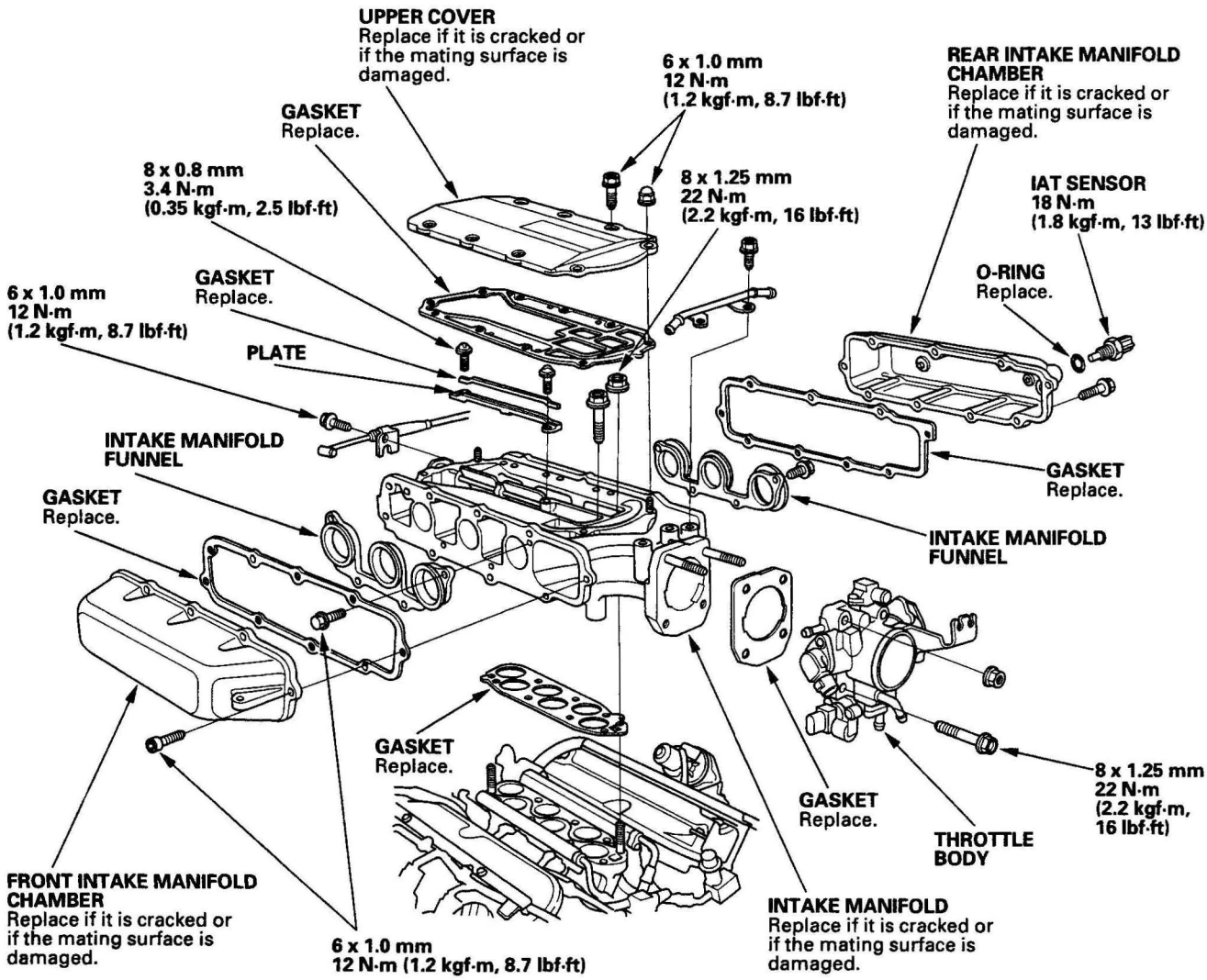
(cont'd)

BACK

Protected by AR

Intake Manifold Removal and Installation (cont'd)

Exploded View—J32A2 engine:



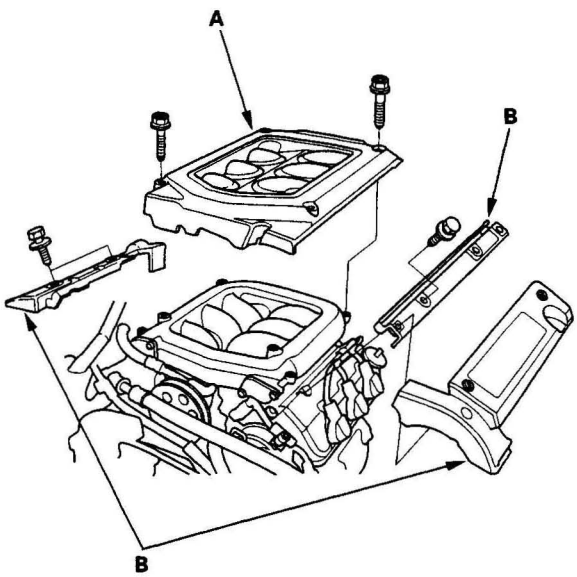
BACK

Protected by AR

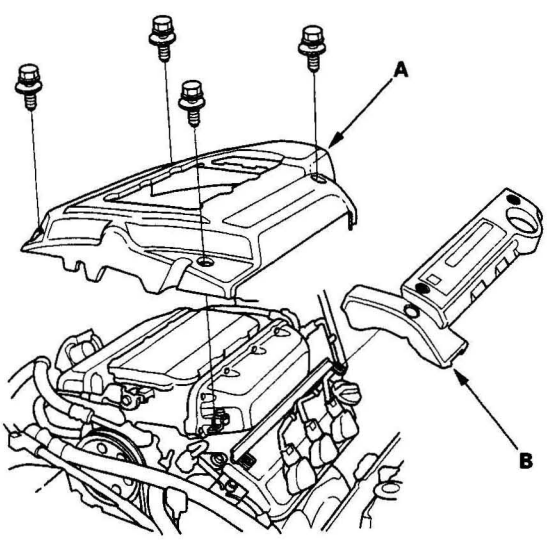
Removal:

1. Remove the intake manifold cover (A) and ignition coil cover(s) (B).

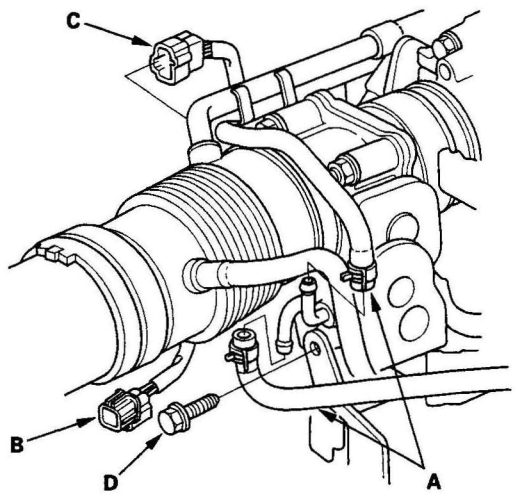
'99 model:



'00-03 models (J32A2 engine shown):



2. Remove the water bypass hoses (A). Disconnect the TCS control actuator connector (B) and the TCS control valve angle sensor connector (C) from the TCS control valve assembly, then remove the bolt (D) securing the TCS control valve bracket (J32A2 engine).



(cont'd)

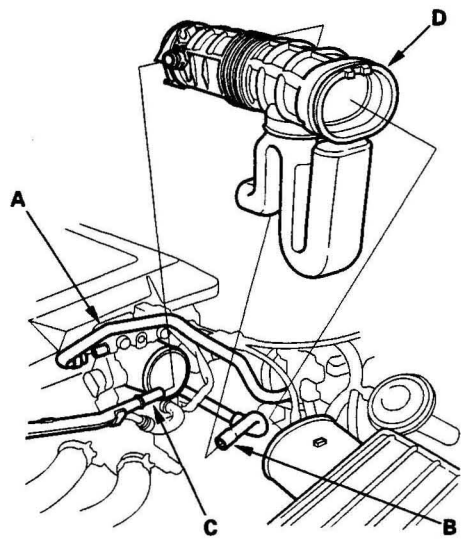
BACK

Protected by AR

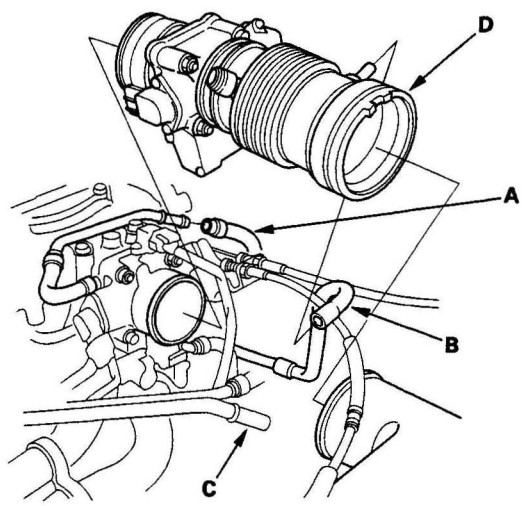
Intake Manifold Removal and Installation (cont'd)

3. Remove the evaporative emission (EVAP) canister hose (A) from the throttle body.

'99 model:

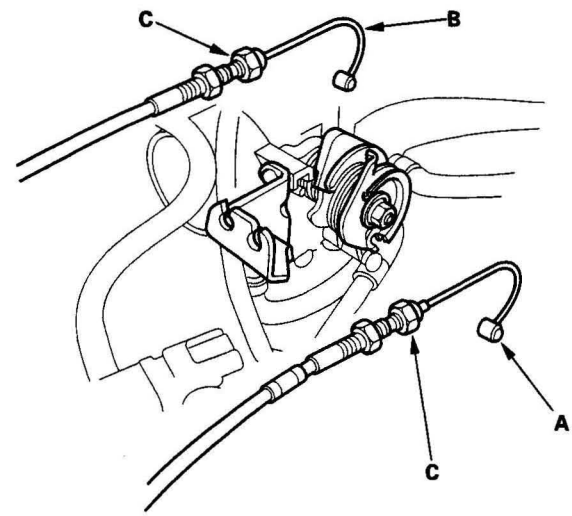


'00-03 models (J32A2 engine shown):



4. Remove the vacuum hose (B) and breather pipe (C), then remove the intake air duct (D).

5. Remove the throttle cable (A) and cruise control cable (B) by loosening the locknuts (C), then slipping the cable ends out of the accelerator linkage. Take care not to bend the cables when removing them. Always replace any kinked cable with a new one.



6. Remove the engine wire harness connectors and wire harness clamps from the intake manifold.

   - Intake air temperature (IAT) sensor connector
   - Idle air control (IAC) valve connector
   - Throttle position (TP) sensor connector
   - Manifold absolute pressure (MAP) sensor connector

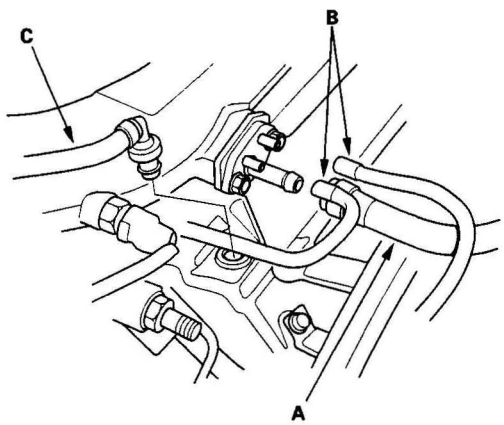
7. Remove the intake manifold runner control (IMRC) cable from the intake manifold side (J32A2 engine).

BACK

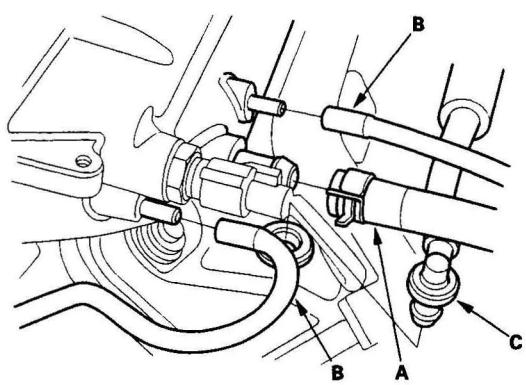
Protected by AR

8. Remove the brake booster vacuum hose (A), vacuum hoses (B) and positive crankcase ventilation (PCV) hose (C).

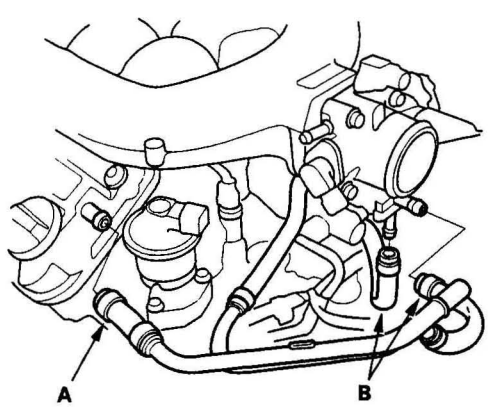
'99 model:



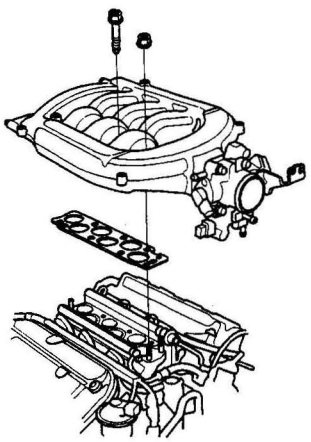
'00-03 models:



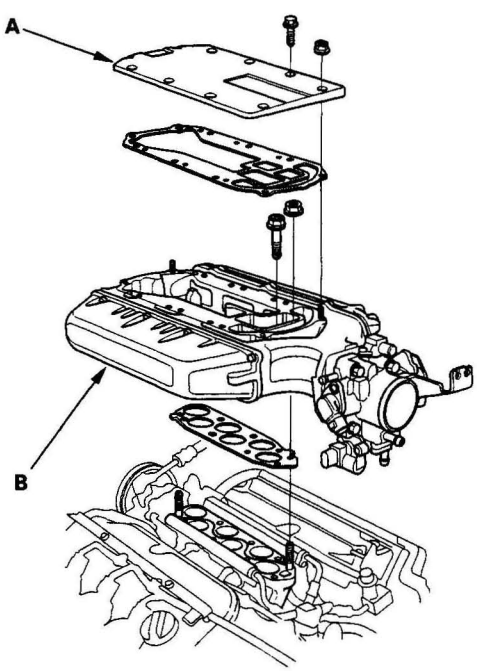
9. Remove the breather hose (A) and water bypass hoses (B).



10. Remove the intake manifold ('99 model).



11. Remove the upper cover (A), then remove the intake manifold (B) ('00-03 models).



(cont'd)

Protected by AR

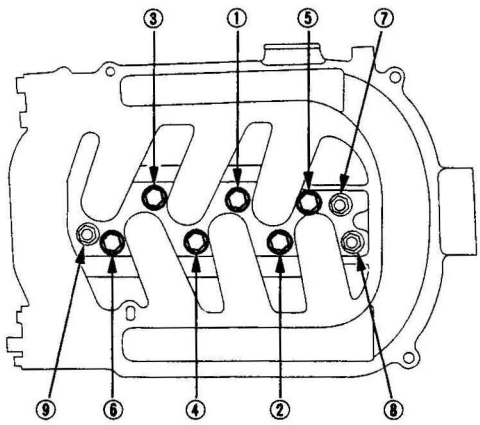
Intake Manifold Removal and Installation (cont'd)

Installation:

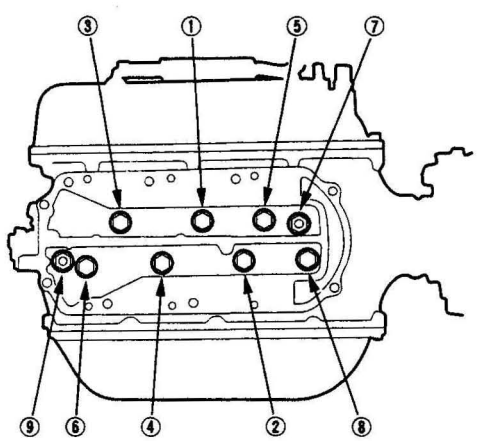
1. Install the intake manifold. Tighten the bolts and nuts sequentially in two or three steps. Always use a new intake manifold gasket.

Specified torque:
8 x 1.25 mm
22 N·m (2.2 kgf·m, 16 lbf·ft)

'99 model:

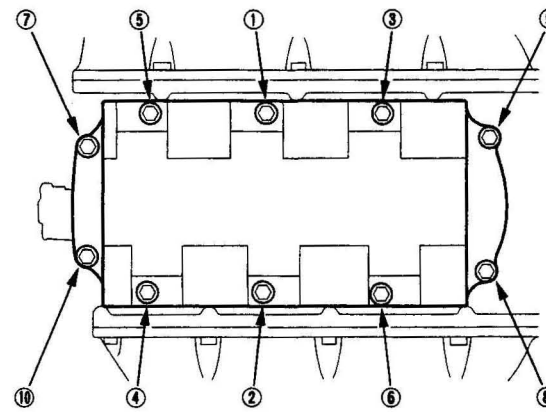


'00-03 models:



2. Install the upper cover. Tighten the bolts and nuts sequentially two or three steps. Always use a new gasket ('00-03 models).

Specified torque:
6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)

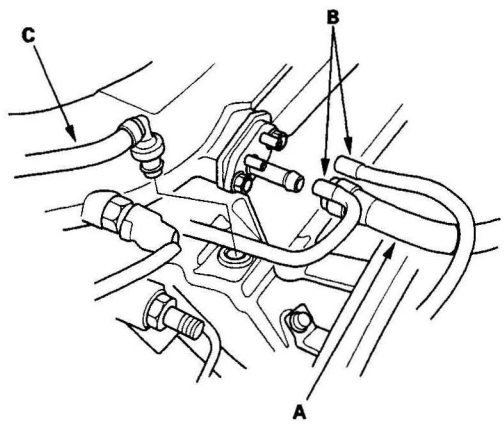


BACK

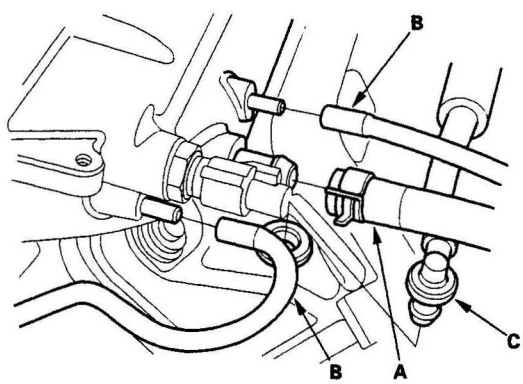
Protected by AR

3. Install the brake booster vacuum hose (A), vacuum hoses (B) and positive crankcase ventilation (PCV) hose (C).

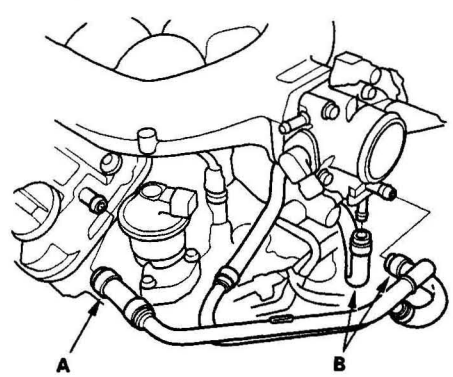
'99 model:



'00-03 models (J32A2 engine shown):



4. Install the breather hose (A) and water bypass hoses (B).

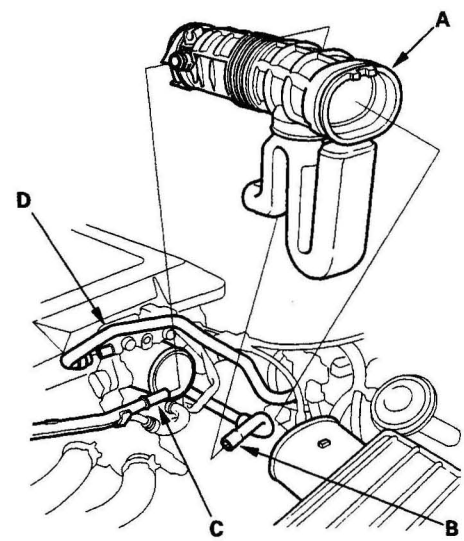


5. Install the throttle cable, then adjust the cable (see page 11-188).

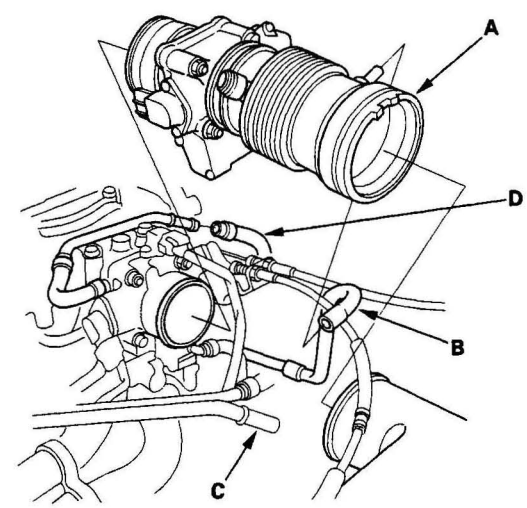
6. Install the cruise control cable, then adjust the cable (see page 4-44).

7. Install the intake air duct (A), then install the vacuum hose (B) and breather pipe (C).

'99 model:



'00-03 models (J32A2 engine shown):



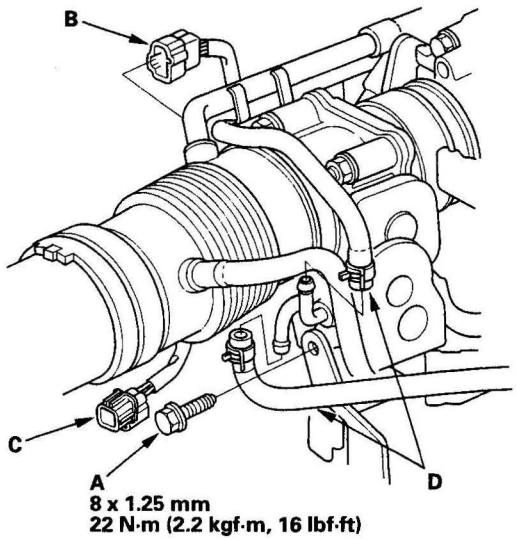
8. Install the evaporative emission (EVAP) canister hose (D).

(cont'd)

Protected by AR

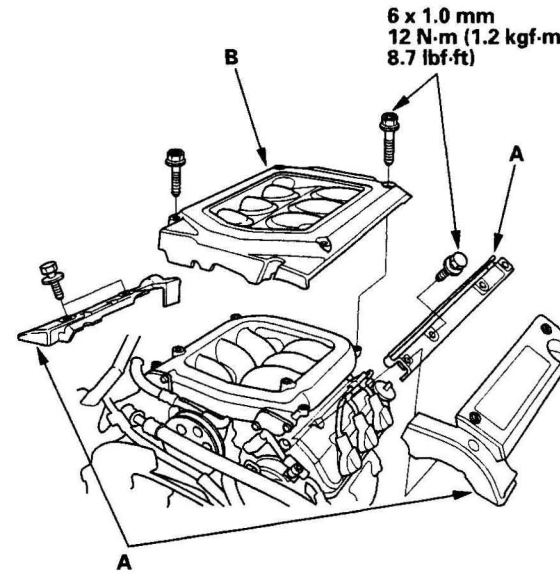
Intake Manifold Removal and Installation (cont'd)

9. Tighten the bolt (A) securing the TCS control valve bracket. Connect the TCS control valve angle sensor connector (B), TCS control valve actuator connector (C) and water bypass hoses (D) on the TCS control valve assembly (J32A2 engine).

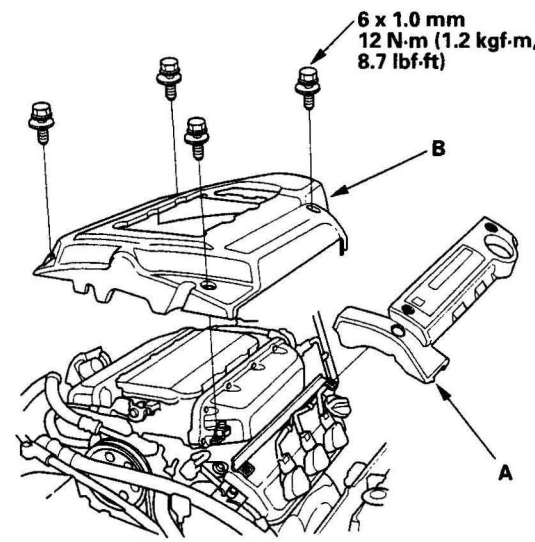


10. Install the ignition coil cover(s) (A) and intake manifold cover (B).

'99 model:



'00-03 models (J32A2 engine shown):



11. Clean up any spilled engine coolant.

12. After installation, check that all tubes, hoses and connectors are installed correctly.

13. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-13).

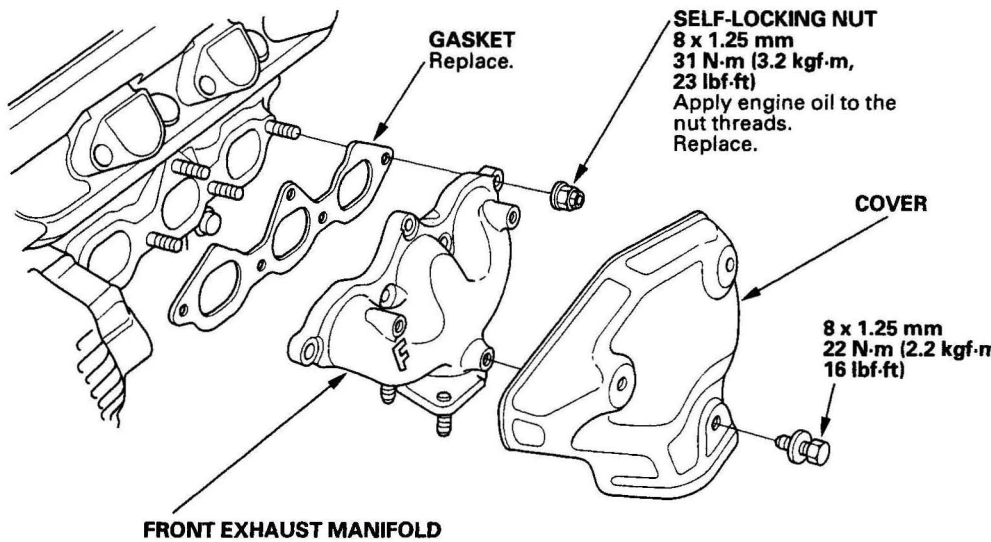
BACK

Protected by AR

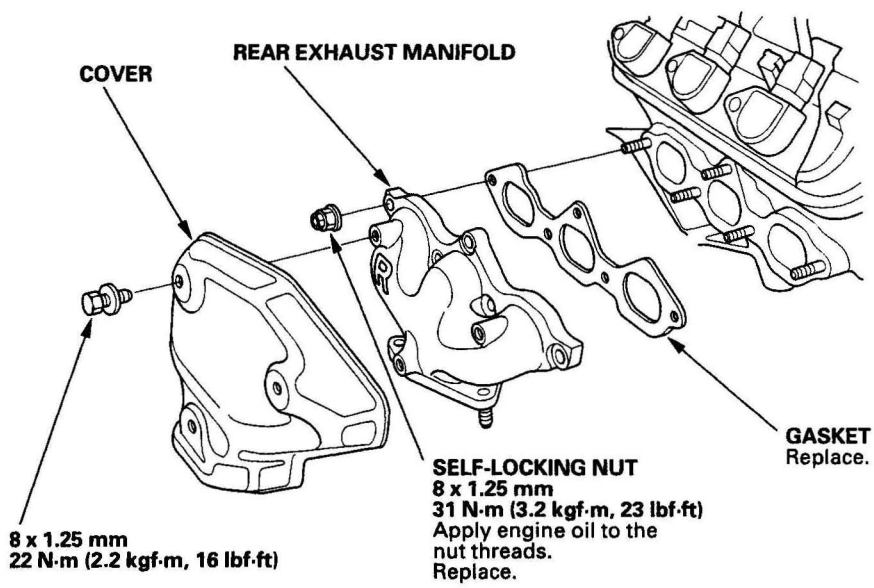
Exhaust Manifold Removal and Installation

NOTE:
- Use new gaskets and self-locking nuts when reassembling.
- Check for folds or scratches on the surfaces of the gaskets.

FRONT:



REAR:



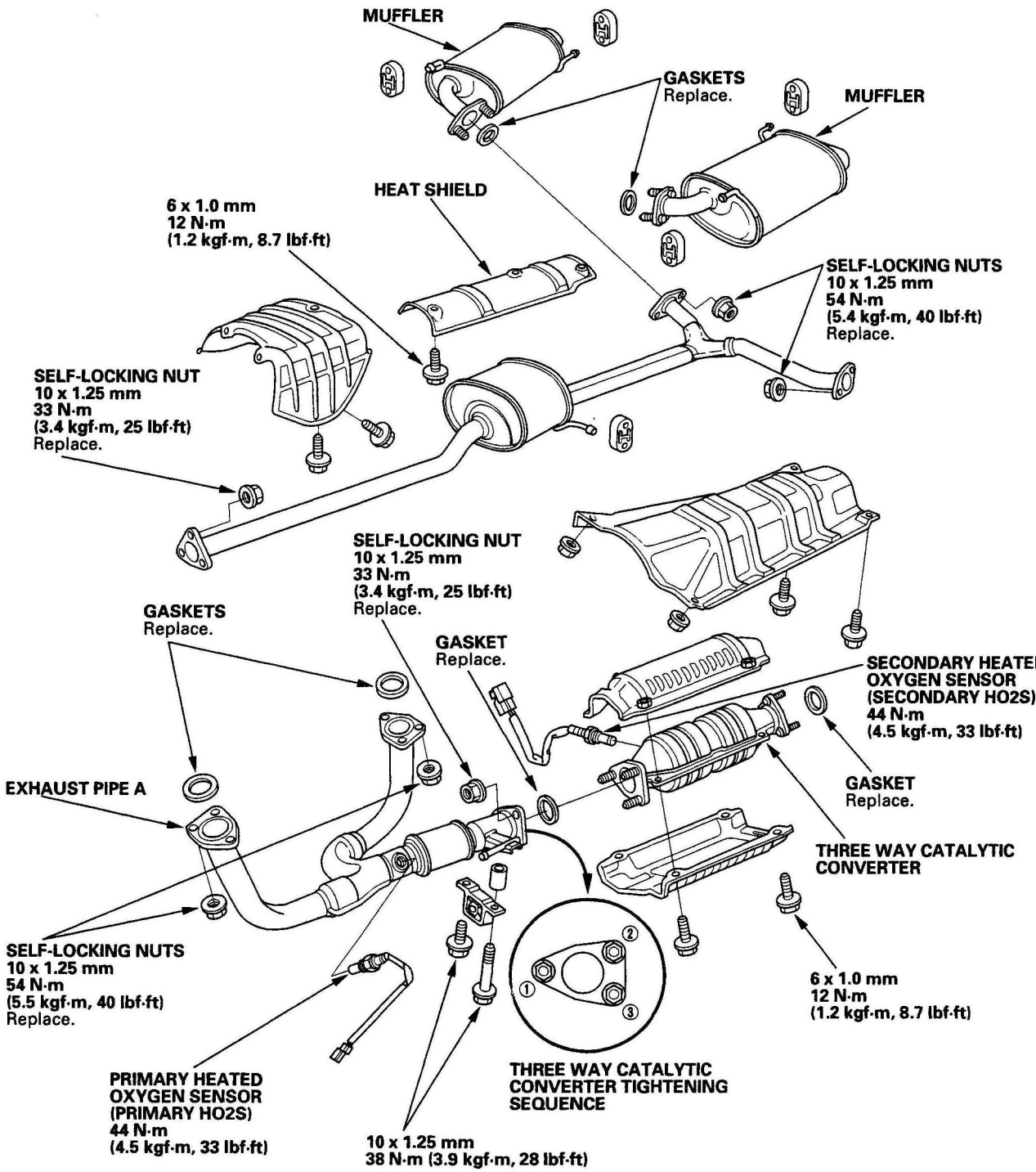
BACK

Protected by AR

Exhaust Pipe and Muffler Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.

J32A1 engine:

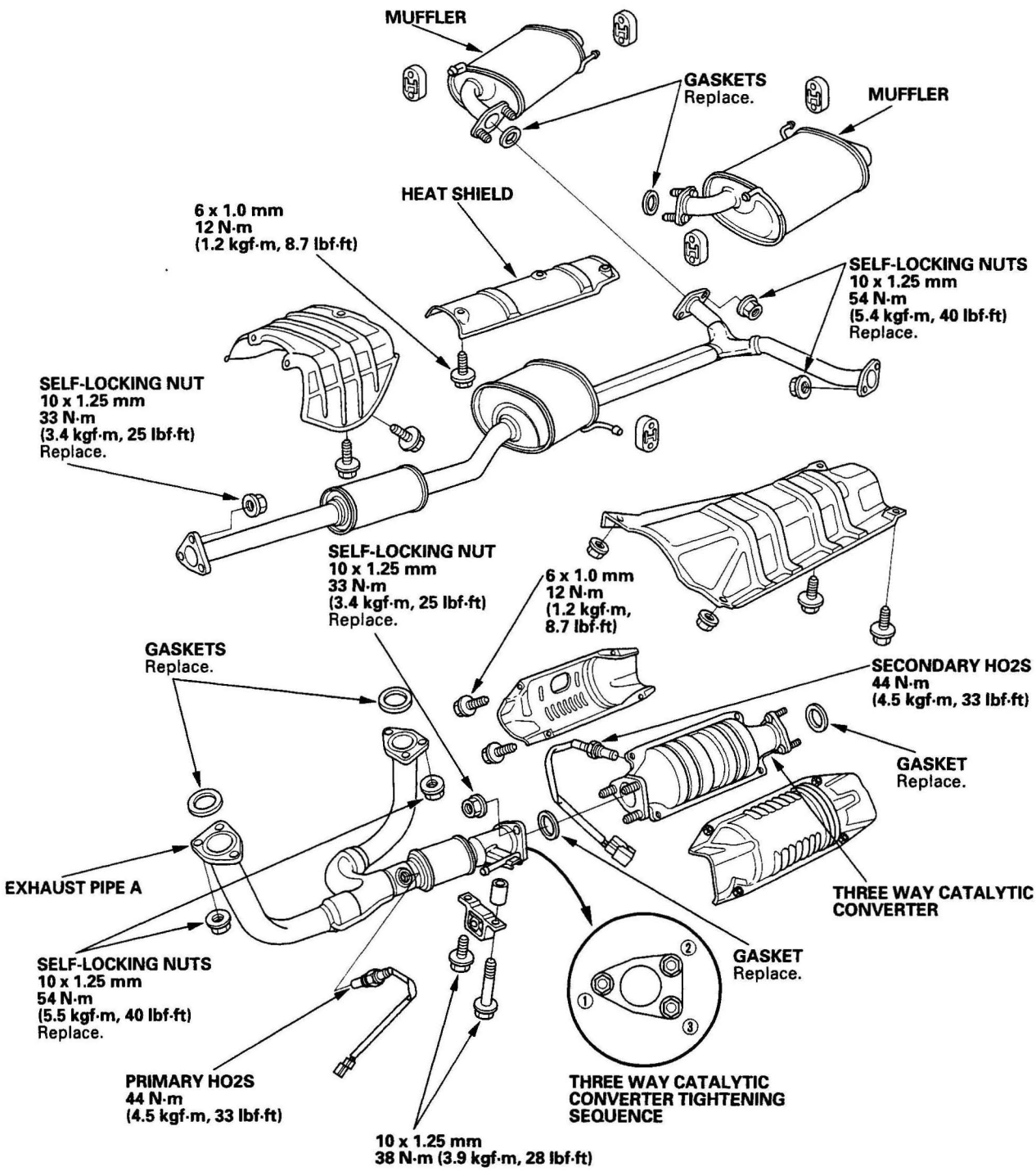


BACK

Protected by AR

NOTE: Use new gaskets and self-locking nuts when reassembling.

J32A2 engine:



BACK

Protected by AR

Engine Cooling

Cooling System

Component Location Index 10-2
Coolant Temperature Gauge Test 10-7
Sending Unit Test 10-9
Radiator Cap Test 10-10
Radiator Test 10-10
Fan Motor Test 10-11
Thermostat Test 10-11
Water Pump Inspection 10-12
Water Pump Replacement 10-12
Coolant Replacement 10-13
Thermostat Replacement 10-15
Radiator and Fans Replacement 10-16

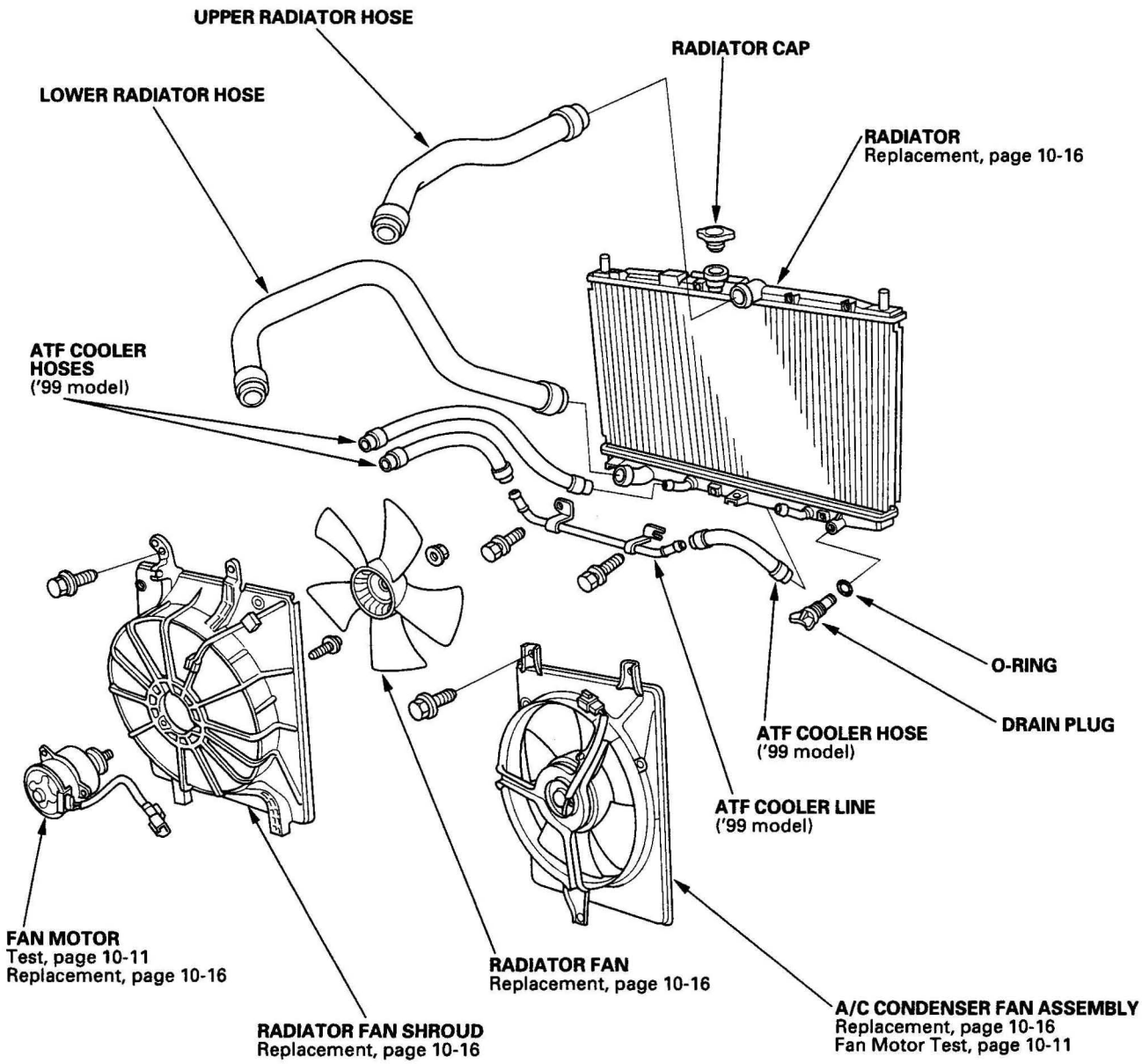
Fan Controls

Component Location Index 10-18
Symptom Troubleshooting Index 10-19
Circuit Diagram 10-20
Radiator Fan Circuit Troubleshooting 10-22
Radiator Fan Switch A Circuit Troubleshooting 10-24
Radiator and Condenser Fans Circuit Troubleshooting A 10-25
Radiator and Condenser Fans Circuit Troubleshooting B 10-26
Radiator and Condenser Fans Circuit Troubleshooting C 10-28
Radiator and Condenser Fans Circuit Troubleshooting D 10-30
Radiator and Condenser Fans Circuit Troubleshooting E 10-31
Radiator and Condenser Fans High Speed Circuit Troubleshooting 10-31
Radiator Fan Switch Test 10-33
Radiator Fan Switch A Replacement 10-33
Radiator Fan Switch B Replacement 10-34
Radiator Fan Switch C Replacement 10-34

Protected by AR

Component Location Index

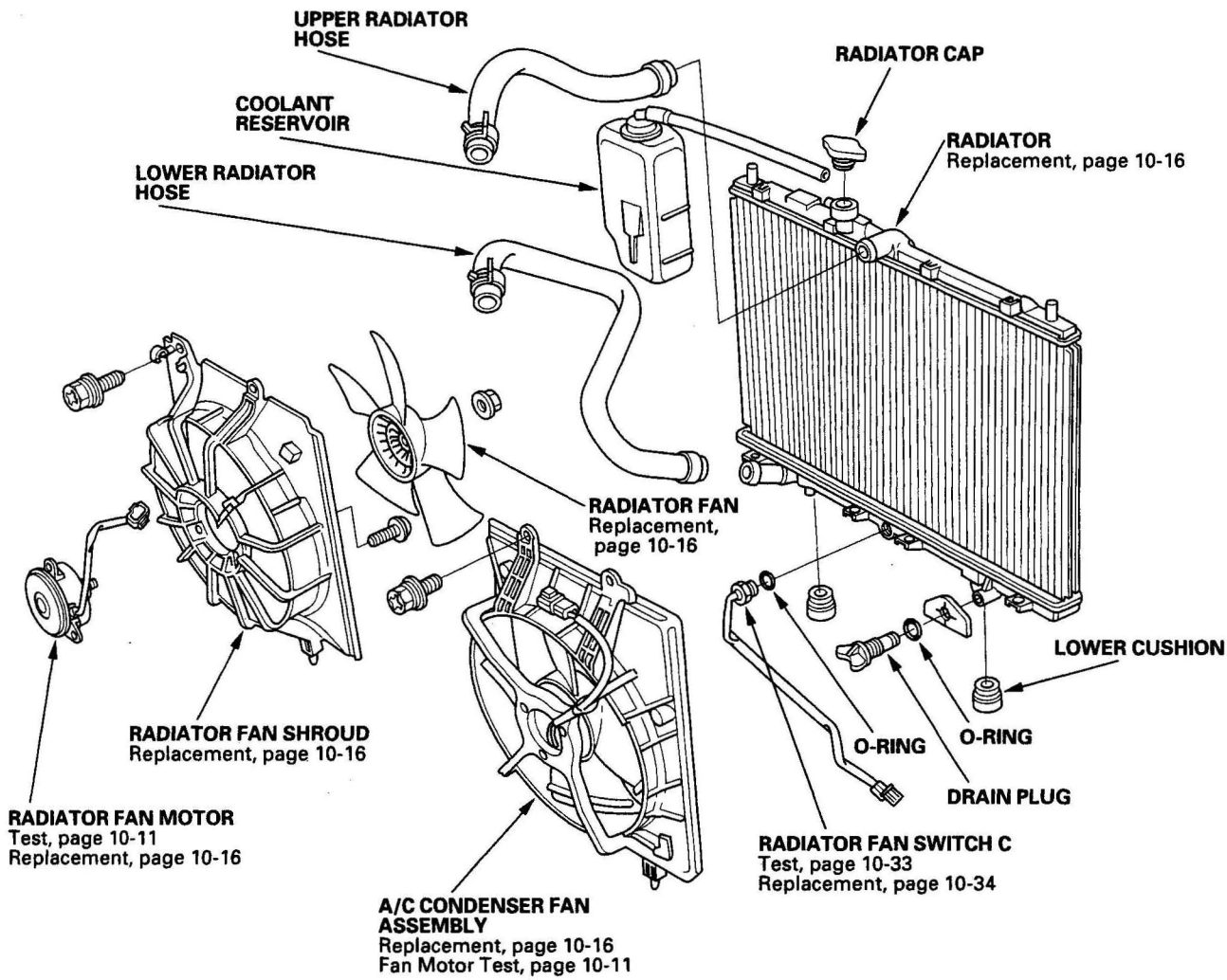
J32A1 engine:



BACK

Protected by AR

J32A2 engine:



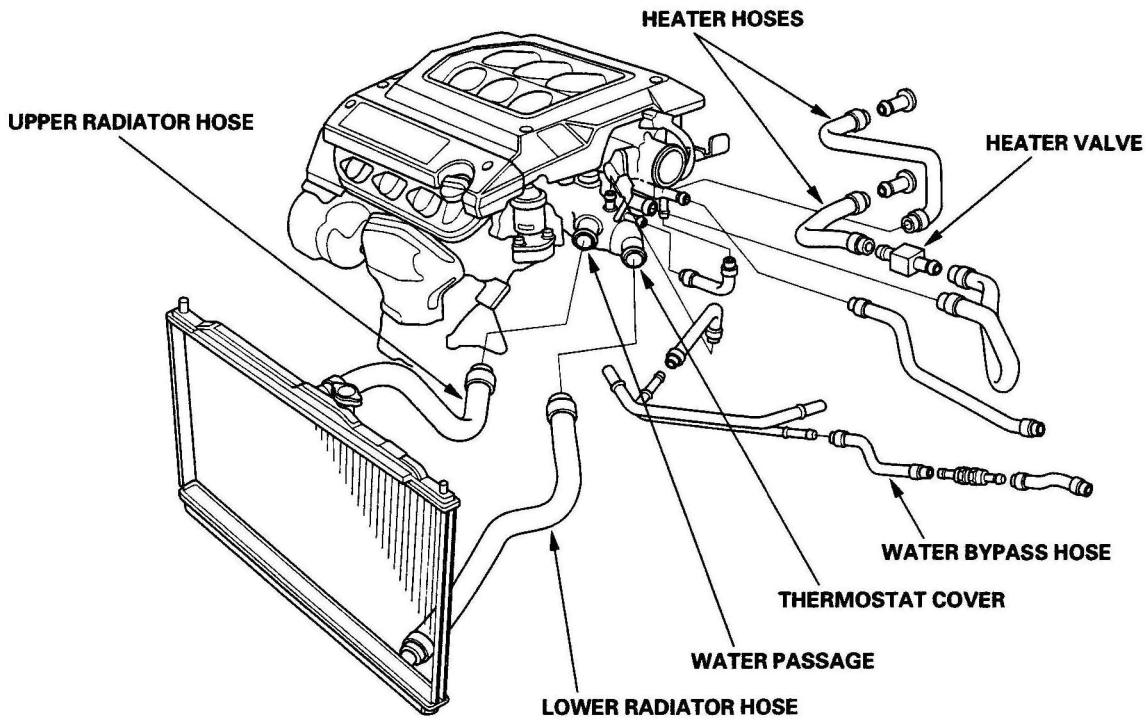
(cont'd)

BACK

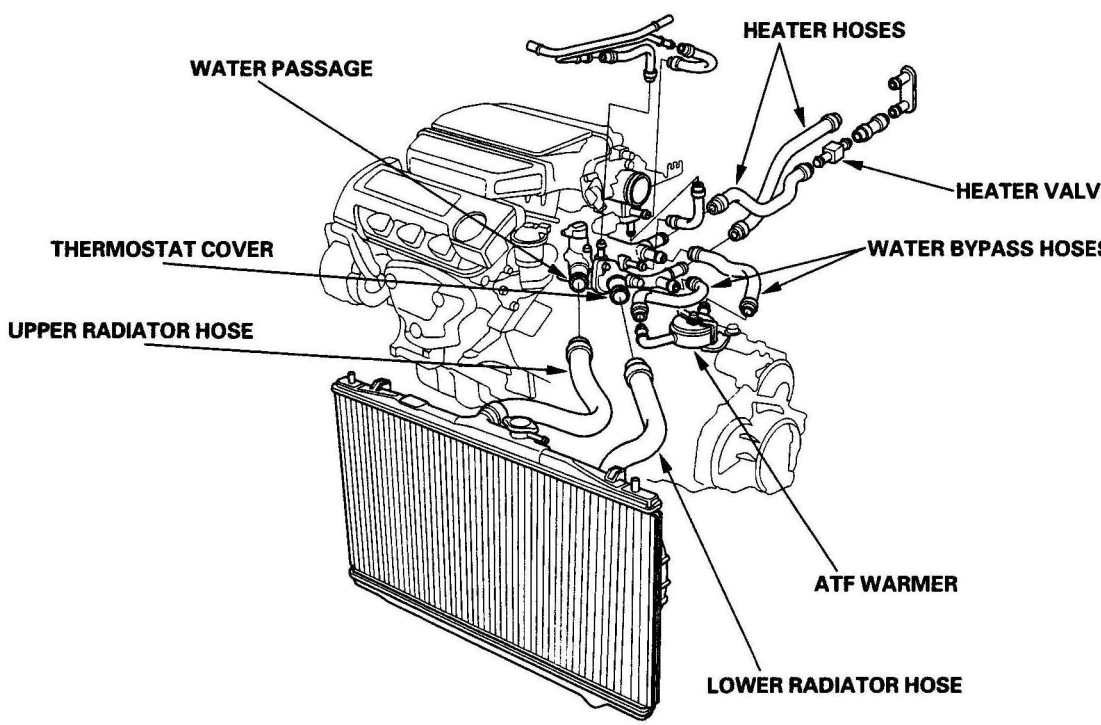
Protected by AR

Component Location Index (cont'd)

J32A1 engine ('99 model):



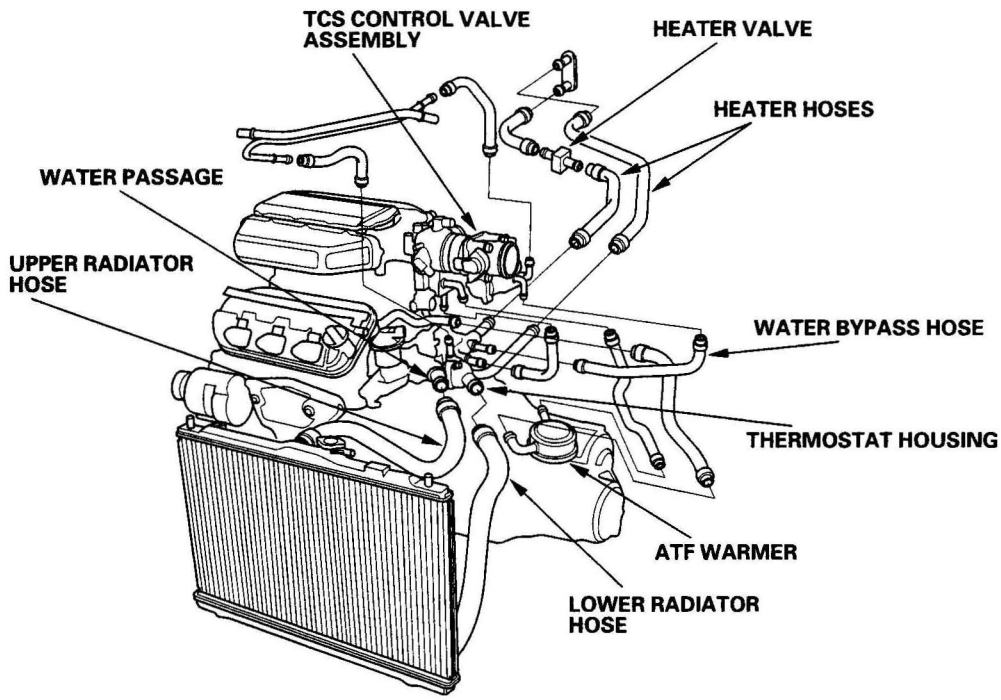
J32A1 engine ('00-03 models):



BACK

Protected by AR

J32A2 engine:

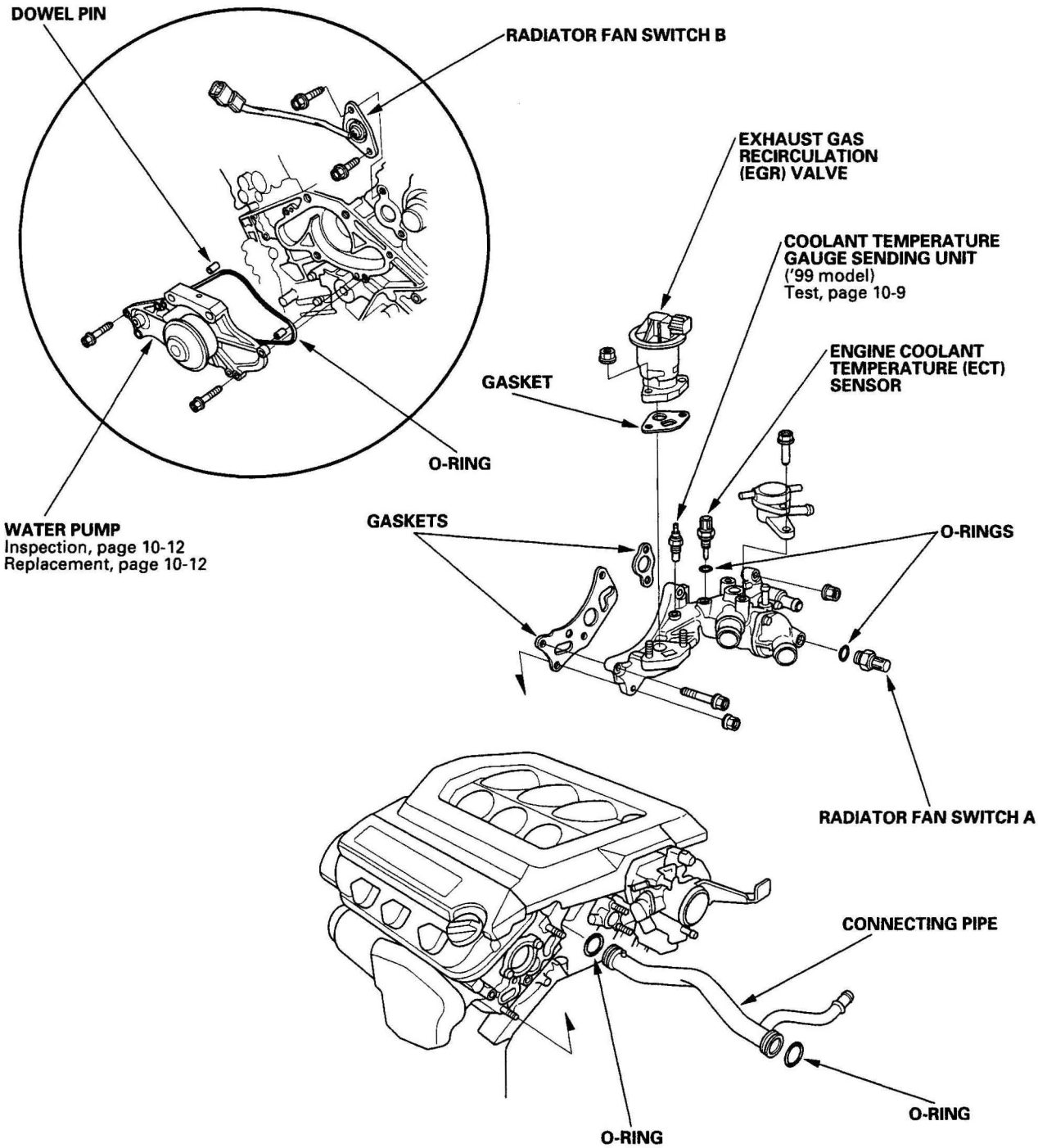


(cont'd)

BACK

Protected by AR

Component Location Index (cont'd)



BACK

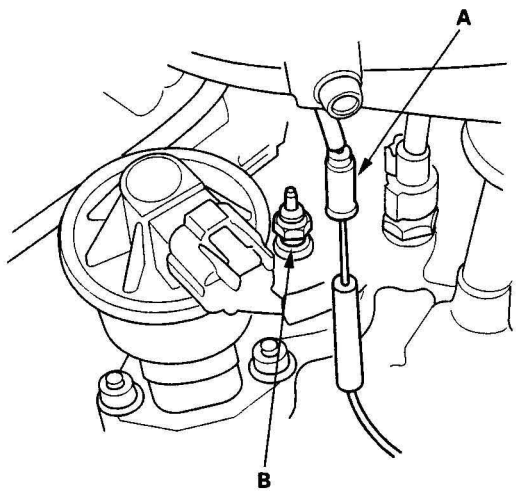
Protected by AR

Coolant Temperature Gauge Test

'99 model:

1. Check the No. 9 (7.5 A) fuse in the under-dash fuse/relay box before testing.

2. Make sure the ignition switch is OFF, then disconnect the YEL/GRN wire (A) from the coolant temperature gauge sending unit (B), and ground it with a jumper wire.



3. Turn the ignition switch ON (II). Check that the pointer of the coolant temperature gauge starts moving toward the "H" mark. Turn the ignition switch OFF before the pointer reaches "H" on the gauge dial. Failure to do so may damage the gauge.

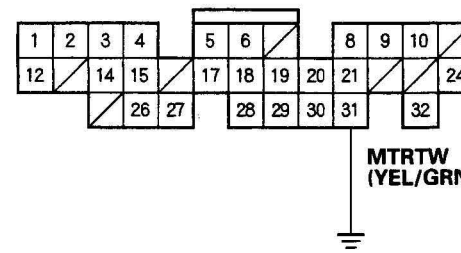
   - If the pointer of the gauge does not move at all, check for an open in the YEL/GRN wire. If the wires are OK, replace the coolant temperature gauge.
   - If the coolant temperature gauge works, test the coolant temperature gauge sending unit.

'00-03 models:

Coolant Temperature Gauge Needle Does Not Move at All:

1. Turn the ignition switch OFF, and connect powertrain control module (PCM) connector terminal A31 to body ground with a jumper wire.

PCM CONNECTOR A (32P)



Wire side of female terminals

2. Turn the ignition switch ON (II).

   After 30 seconds or more, does the temperature gauge needle move to the Hot side?

   YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.

   NO – Go to step 3.

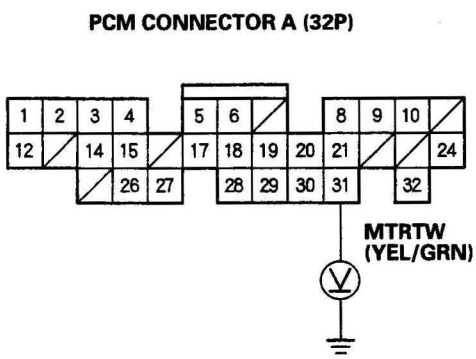
3. Turn the ignition switch OFF, and disconnect PCM connector A (32P).

(cont'd)

Protected by AR

Coolant Temperature Gauge Test (cont'd)

4. Turn the ignition switch ON (II), and measure voltage between PCM connector terminal A31 and body ground.



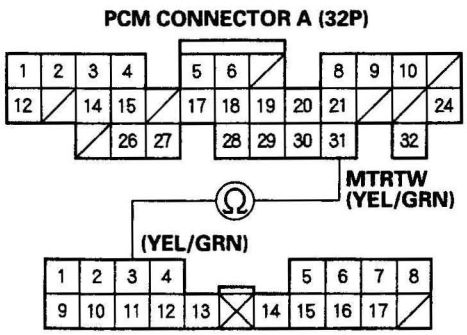
Wire side of female terminals

Is there about 5 V?

YES—Replace the fuel and temperature gauge assembly.■

NO—Go to step 5.

5. Turn the ignition switch OFF, and check for continuity between PCM connector terminal A31 and gauge assembly connector terminal B3.



GAUGE ASSEMBLY CONNECTOR B (18P)
Wire side of female terminals

Is there continuity?

YES—Replace the fuel and temperature gauge assembly.■

NO—Repair open in the wire between PCM connector terminal A31 and gauge connector terminal B3.■

Coolant Temperature Gauge Needle Goes Past the Hot Mark:

1. Turn the ignition switch OFF, and disconnect PCM connector A (32P).

2. Turn the ignition switch ON (II), and watch the coolant temperature gauge.

   Does the temperature gauge needle move at all? (you may have to watch it for about 30 seconds).

   YES—Go to step 3.

   NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

3. Turn the ignition switch OFF, then turn it ON (II) again, and watch the coolant temperature gauge.

   Does the temperature gauge needle immediately go past the Hot mark?

   YES—Replace the fuel and temperature gauge assembly.■

   NO—The temperature gauge needle went past the Hot mark after about 30 seconds or more. Go to step 4.

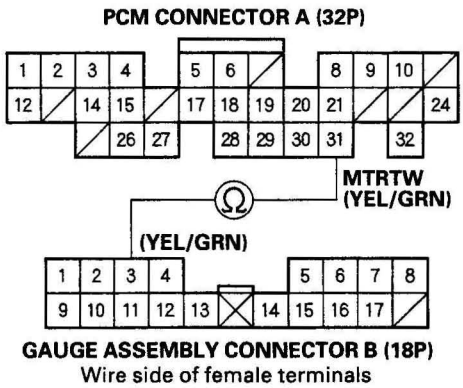
BACK

Protected by AR

Sending Unit Test

4. Turn the ignition switch OFF, and disconnect the gauge assembly connector B (18P).

5. Check for continuity between PCM connector terminal A31 and gauge assembly connector terminal B3.



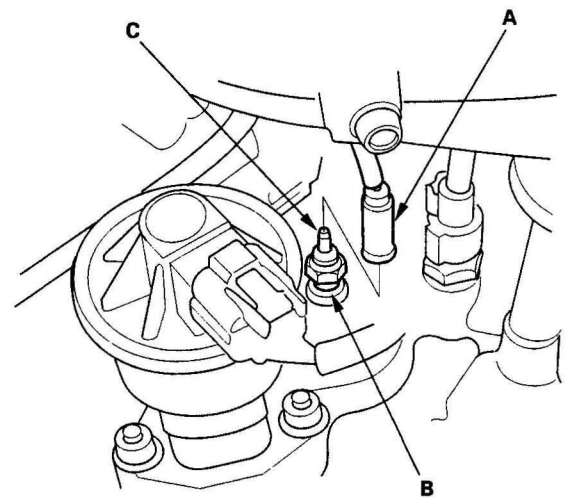
Is there continuity?

YES—Repair short in the wire between PCM connector A31 and gauge connector terminal B3. ■

NO—Replace the fuel and temperature gauge assembly. ■

'99 model:

1. Disconnect the YEL/GRN wire (A) from the coolant temperature gauge sending unit (B).



2. Using an ohmmeter, measure the change in resistance between the positive terminal (C) and the engine (ground) with the engine cold and with the engine at operating temperature.

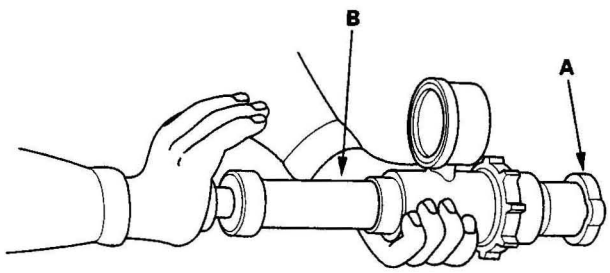
Temperature	133°F (56°C)	185°F (85°C)—212°F (100°C)
Resistance (Ω)	137	46—30

3. If the obtained readings are substantially different from the specifications above, replace the sending unit.

Protected by AR

Radiator Cap Test

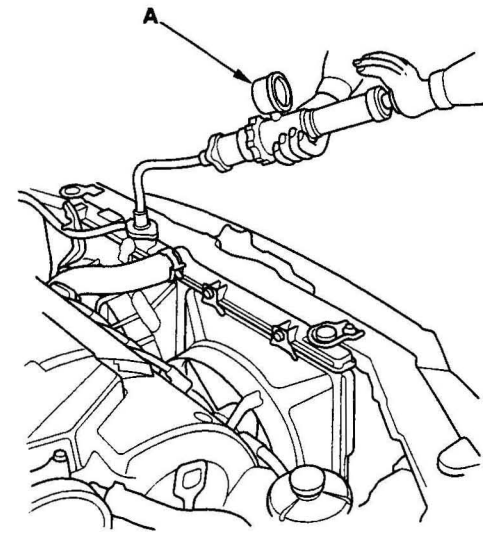
1. Remove the radiator cap (A), wet its seal with engine coolant, then install it on a commercially available pressure tester (B).



2. Apply a pressure of 93 – 123 kPa (0.95 – 1.25 kgf/cm², 14 – 18 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.

Radiator Test

1. Wait until the engine is cool, then carefully remove the radiator cap and fill the radiator with engine coolant to the top of the filler neck.
2. Attach a commercially available pressure tester (A) to the radiator and apply a pressure of 93 – 123 kPa (0.95 – 1.25 kgf/cm², 14 – 18 psi).



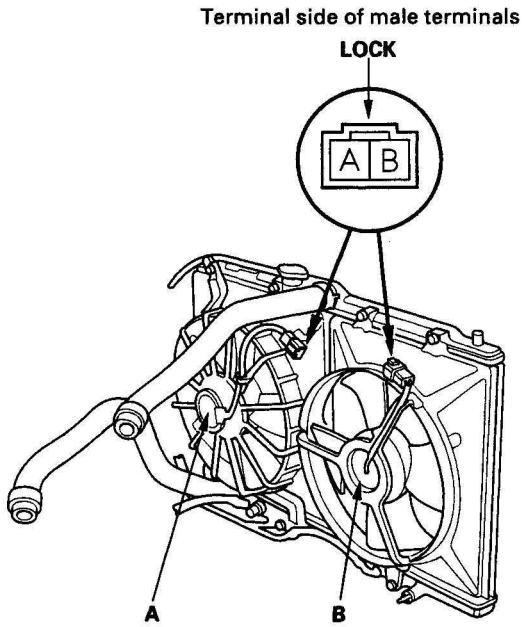
3. Inspect for engine coolant leaks and a drop in pressure.
4. Remove the tester and reinstall the radiator cap.
5. Check for engine oil in the coolant and/or coolant in the engine oil.

BACK

Protected by AR

Fan Motor Test

1. Disconnect the 2P connectors from the radiator fan motor (A) and condenser fan motor (B).



2. Test the motor by connecting battery power to the B terminal, and ground to the A terminal.

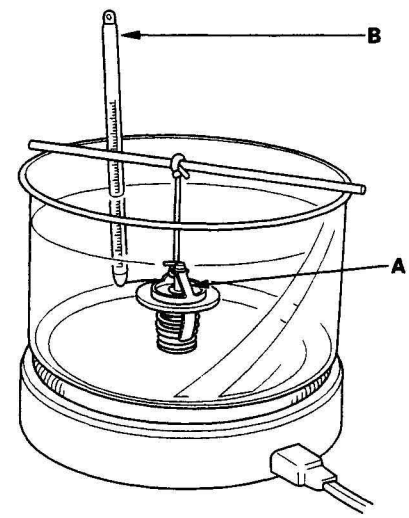
3. If the motor fails to run or does not run smoothly, replace it.

Thermostat Test

Replace the thermostat if it is open at room temperature.

To test a closed thermostat:

1. Suspend the thermostat (A) in a container of water. Do not let the thermometer (B) touch the bottom of the hot container.



2. Heat the water and check the temperature with a thermometer. Check the temperature at which the thermostat first opens, and at which it is fully open.

3. Measure the lift height of the thermostat when it is fully open.

STANDARD THERMOSTAT

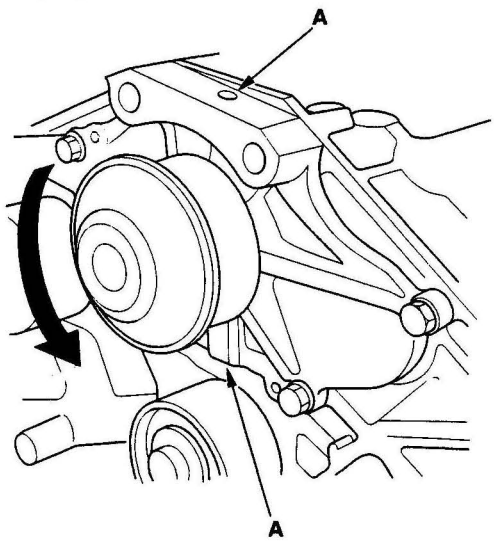
Lift height:	**above 10.0 mm (0.39 in.)**
Starts opening:	**'99 model: 163–171°F (73–77°C)**
	'00-03 models: 169–176°F (76–80°C)
Fully open:	**194°F (90°C)**

BACK

Protected by AR

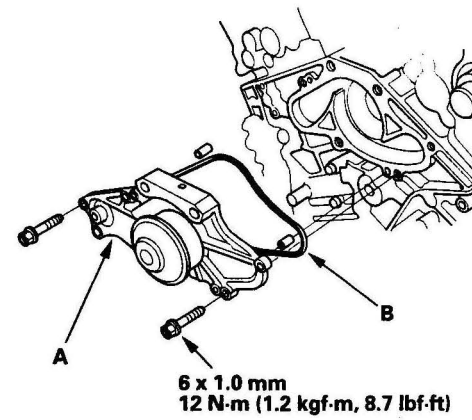
Water Pump Inspection

1. Remove the timing belt (see page 6-18).
2. Turn the water pump pulley counterclockwise. Check that it turns freely.
3. Check for signs of seal leakage. A small amount of "weeping" from the bleed hole (A) is normal.



Water Pump Replacement

1. Remove the timing belt (see page 6-18).
2. Remove the timing belt tensioner.
3. Remove the water pump (A) by removing five bolts.



4. Inspect and clean the O-ring groove and mating surface with the cylinder block.
5. Install the water pump with a new O-ring (B) in the reverse order of removal.
6. Clean up any spilled engine coolant.

BACK

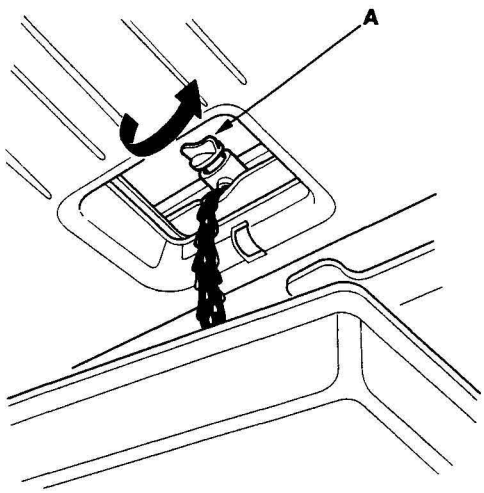
Protected by AR

Coolant Replacement

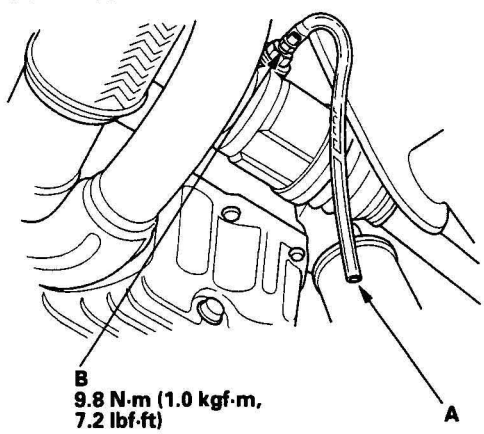
1. Turn the ignition switch on (II). Set the displayed temperature on the climate control system to 90°F (32°C), then turn off the ignition switch. Make sure the engine and radiator are cool to the touch.

2. Remove the radiator cap.

3. Loosen the drain plug (A), and drain the coolant.



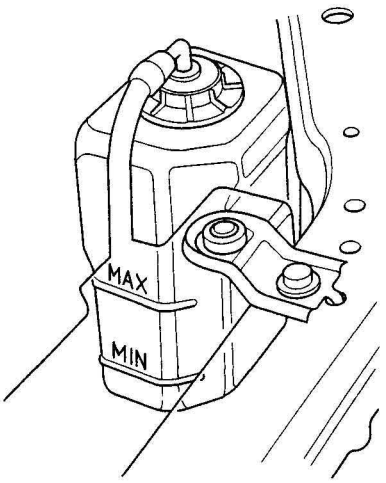
4. Install a rubber hose (A) on the drain bolt (B) located at the rear of the cylinder block, then loosen the drain bolt.



5. When the coolant stops draining, tighten the drain bolt.

6. Tighten the radiator drain plug securely.

7. Remove, drain, and reinstall the reservoir. Fill the tank to the MAX mark with Honda All Season Antifreeze/Coolant Type 2.

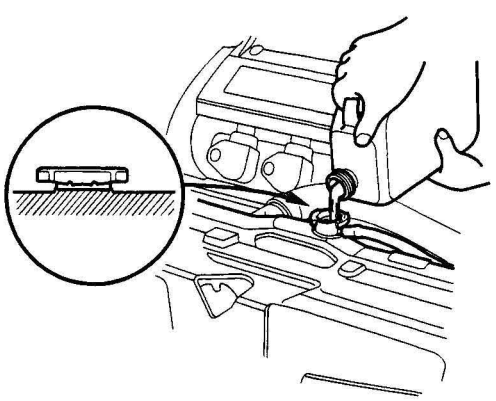


8. Pour Honda All Season Antifreeze/Coolant Type 2 into the radiator up to the base of the filler neck.

NOTE:
- Always use Honda All Season Antifreeze/Coolant Type 2. Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
- Honda All Season Antifreeze/Coolant Type 2 is a mixture of 50 % antifreeze and 50 % water. Pre-mixing is not required.

Engine Coolant Refill Capacity
5.6 ℓ (5.9 US qt) including the reservoir capacity

Reservoir Capacity
'99-01 models: 0.6 ℓ (0.6 US qt)
'02-03 models: 0.8 ℓ (0.8 US qt)



9. Install the radiator cap loosely.

(cont'd)

Protected by AR

Coolant Replacement (cont'd)

10. Start the engine and let it run until it warms up (the radiator fan comes on at least twice).

11. Turn off the engine. Check the level in the radiator, and add Honda All Season Antifreeze/Coolant Type 2 if needed.

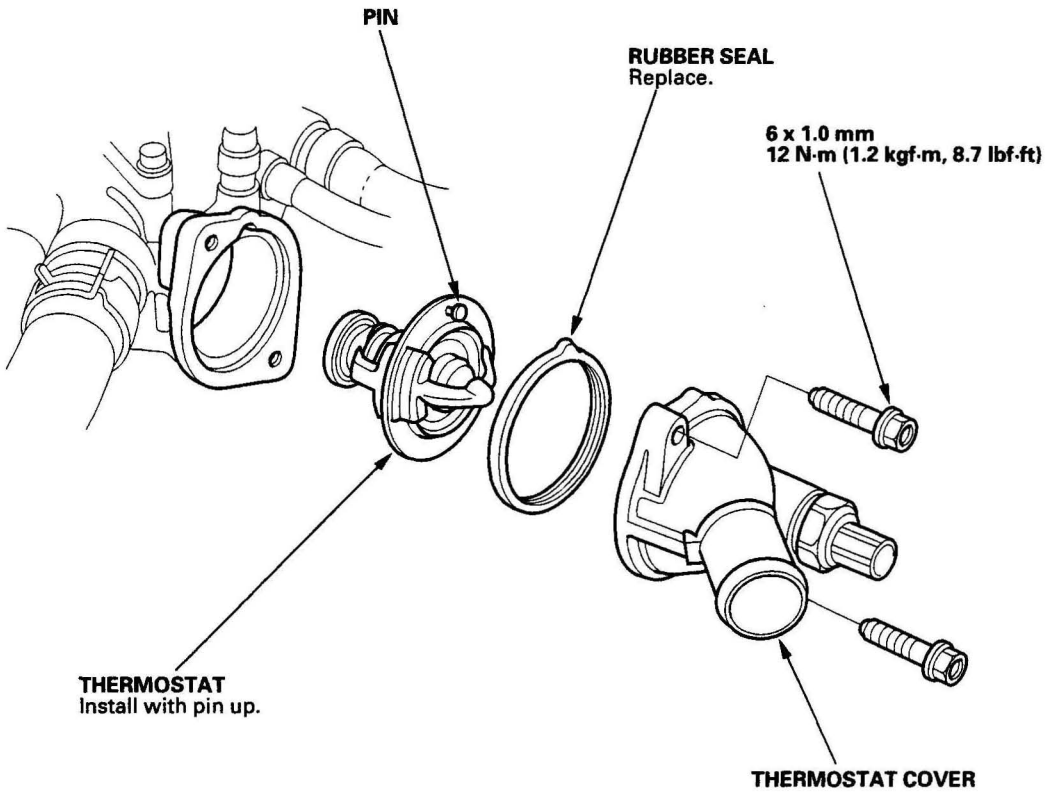
12. Put the radiator cap on tightly, then run the engine again and check for leaks.

BACK

Protected by AR

Thermostat Replacement

NOTE: Use new O-rings when reassembling.

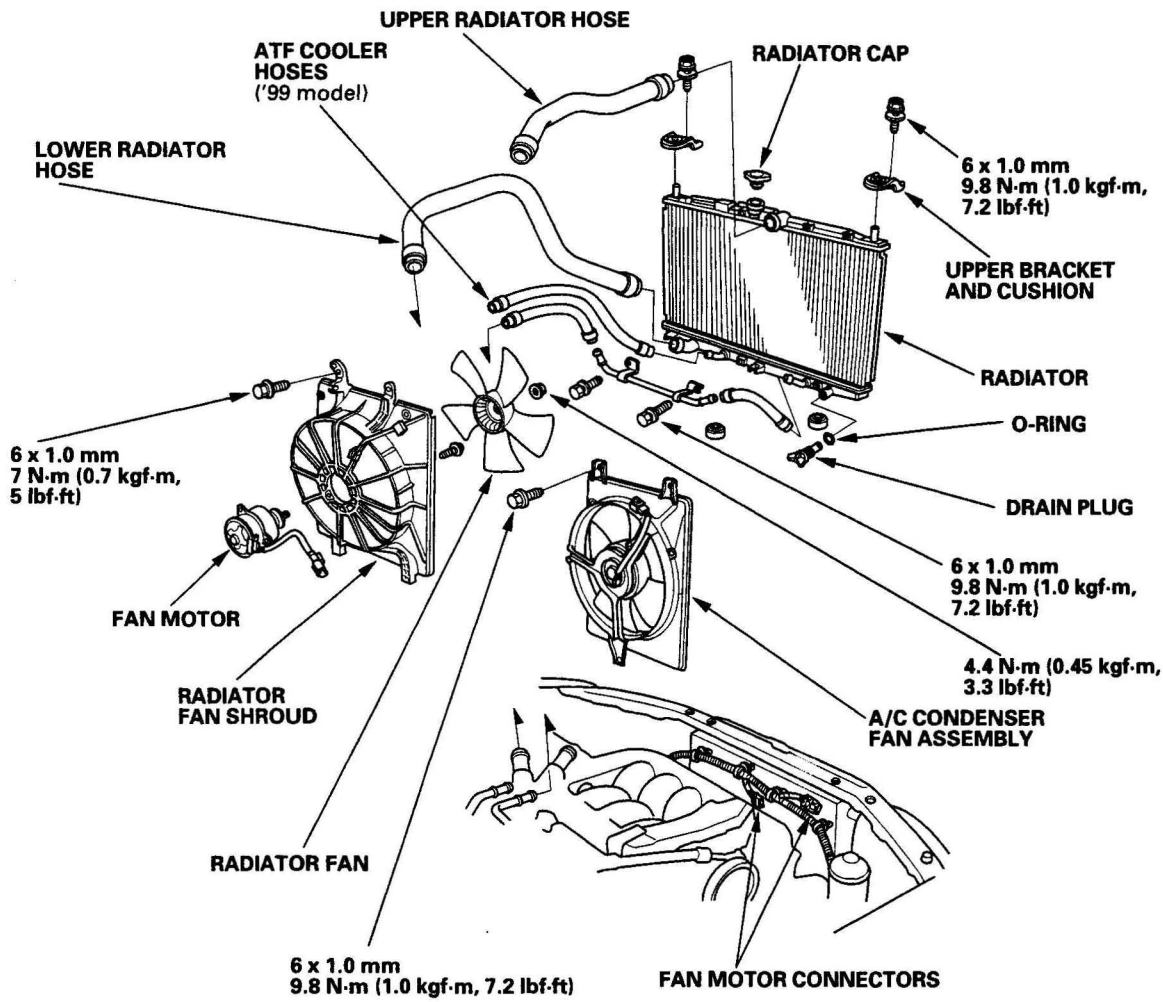


Protected by AR

Radiator and Fans Replacement

J32A1 engine:

1. Drain the engine coolant.
2. Remove the upper and lower radiator hoses.



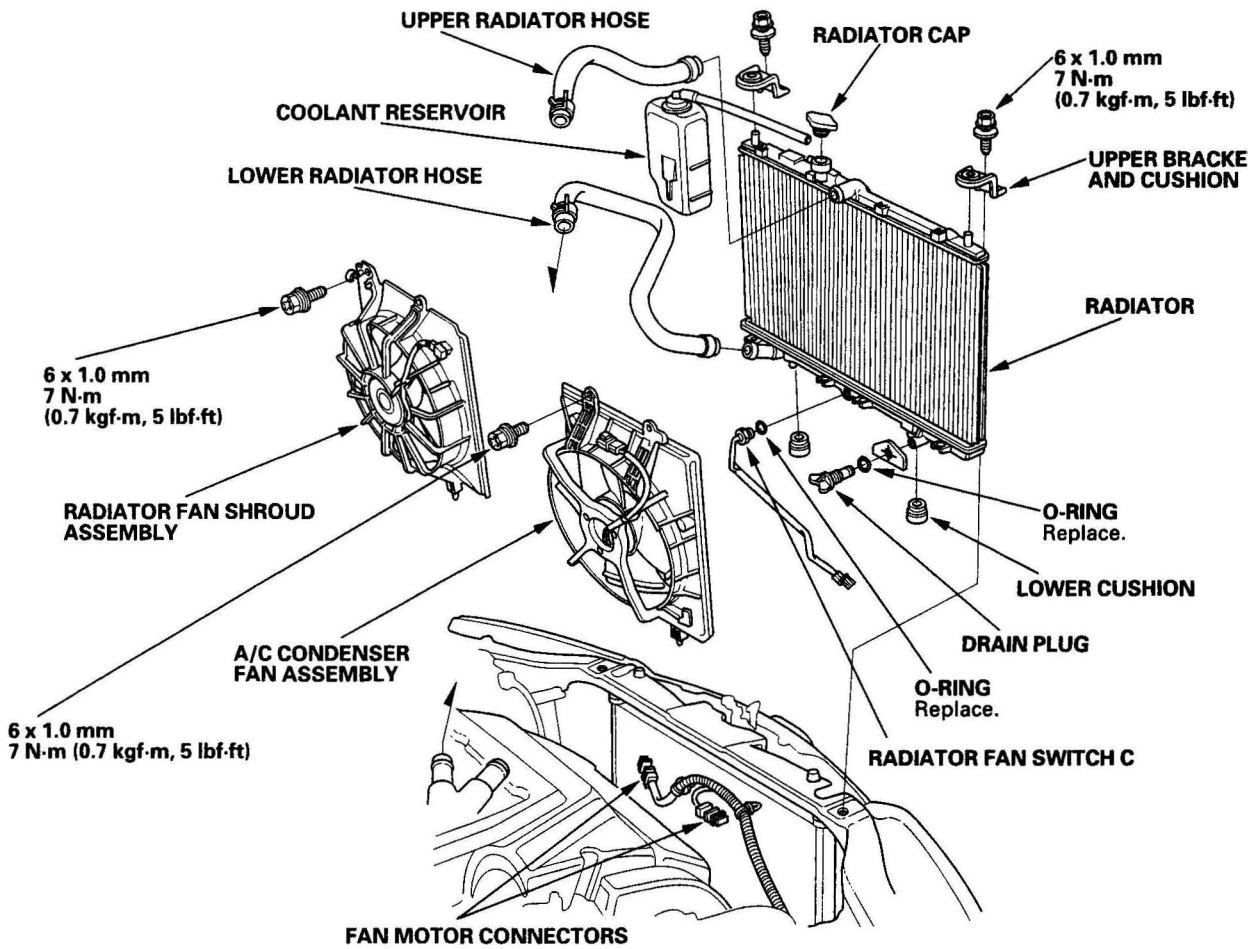
3. Remove the ATF cooler hoses ('99 model)
4. Disconnect the fan motor connectors.
5. Remove the radiator upper brackets, then pull up the radiator.
6. Remove the fan shroud assemblies and other parts from the radiator.
7. Install the radiator in the reverse order of removal.
8. Set the upper and lower cushions securely.
9. Fill the radiator with engine coolant and bleed the air.

BACK

Protected by AR

J32A2 engine:

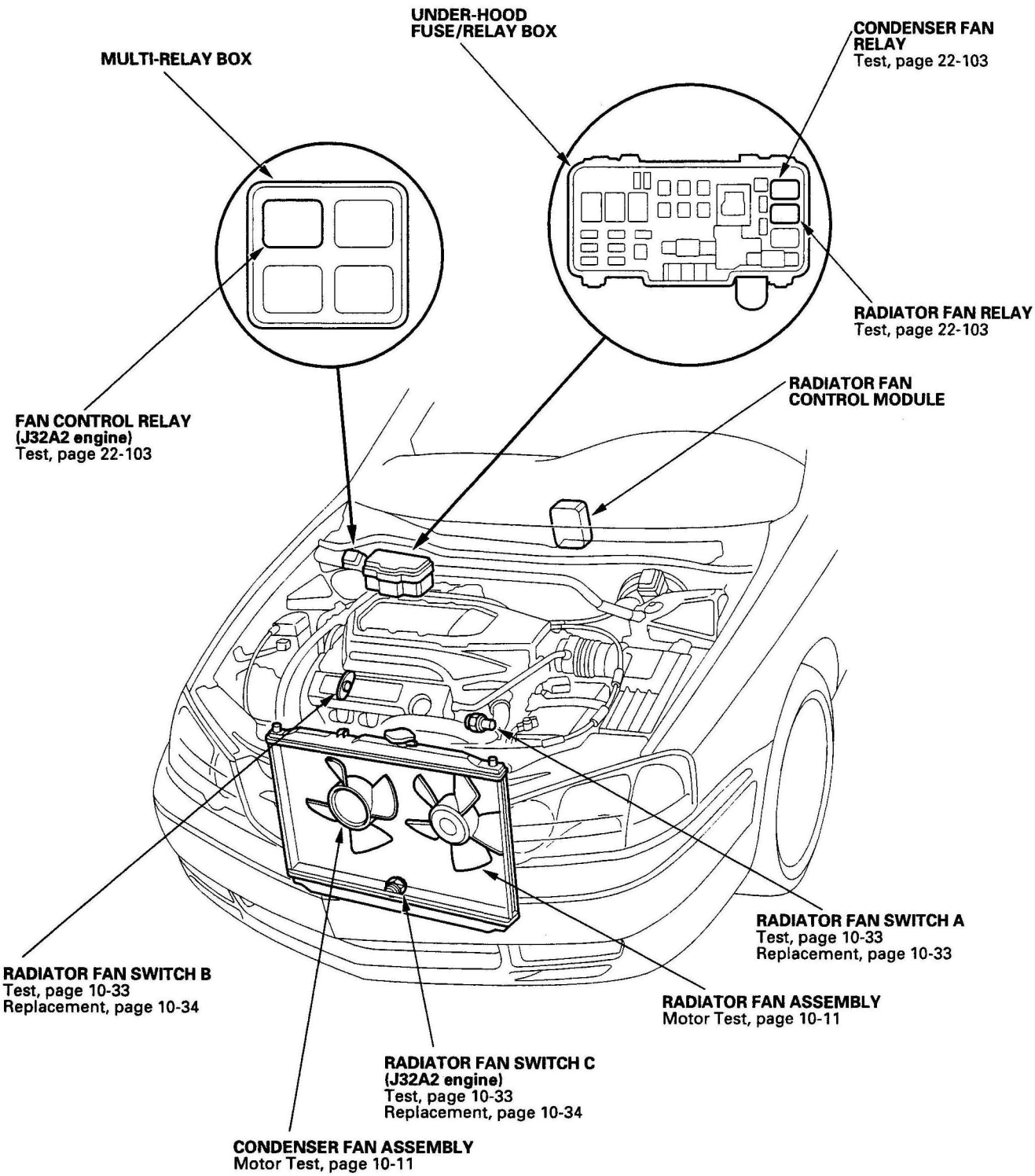
1. Drain the engine coolant.
2. Remove the upper radiator hose and lower radiator hose.



3. Disconnect the fan motor connectors.
4. Disconnect the radiator fan switch C connector.
5. Remove the radiator upper brackets, then pull up the radiator.
6. Remove the fan shroud assemblies and other parts from the radiator.
7. Install the radiator in the reverse order of removal. Make sure the upper and lower cushions are set securely.
8. Fill the radiator with engine coolant and bleed the air.

Protected by AR

Component Location Index



BACK

Protected by AR

Symptom Troubleshooting Index

J32A1 engine:

Symptom	Diagnostic procedure	Also check for
Radiator fan does not run at all	Radiator fan circuit troubleshooting (see page 10-22)	
Radiator fan does not run for engine cooling, but it does run with A/C ON	Radiator fan switch A circuit troubleshooting (see page 10-24)	
Both fans do not run at all	Radiator and condenser fans circuit troubleshooting A (see page 10-25)	

J32A2 engine:

Symptom	Diagnostic procedure	Also check for
Both radiator fan and condenser fan do not run with A/C ON and when the engine coolant temperature is above 199°F (93°C)	Radiator and condenser fans circuit troubleshooting A (see page 10-25).	
Radiator fan does not run at all, but condenser fan runs with A/C ON or when the engine coolant temperature is above 199°F (93°C)	Radiator and condenser fans circuit troubleshooting B (see page 10-26).	
Condenser fan runs but radiator fan does not run when the engine coolant temperature is above 199°F (93°C), but both fans run with A/C ON	Remove the radiator fan control relay, and test. • If the relay is faulty, replace it. • If the relay is OK, repair an open in the wire between the radiator fan control relay 5P connector terminal No. 4 and the radiator fan motor 2P connector terminal No. 2.	
Both radiator fan and condenser fan do not run when the engine coolant temperature is above 199°F (93°C), but both fan s run with A/C ON	Radiator and condenser fans circuit troubleshooting C (see page 10-28)	
Both radiator and condenser fans do not run when the engine coolant temperature is above 199°F (93°C), but both fans change speed with A/C ON	Radiator and condenser fans circuit troubleshooting D (see page 10-30)	
Both radiator fan and condenser fan run with ignition switch ON (II), with A/C OFF, and when the engine temperature is below 199°F (93°C)	Radiator and condenser fans circuit troubleshooting E (see page 10-31)	
Both radiator fan and condenser fan do not run at high speed with the A/C ON	Radiator and condenser fans high speed circuit troubleshooting (see page 21-42)	
Both radiator fan speed and condenser fan speed do not change from Low to Hi when the engine coolant temperature is above 210°F (99°C), but both fans change speed with A/C ON	Radiator and condenser fans high speed circuit troubleshooting (see page 10-31)	
Condenser fan speed does not change from Low to Hi with A/C ON and the engine coolant temperature above 210°F (99°C)	Condenser Fan High Speed Circuit Troubleshooting (see page 21-41)	

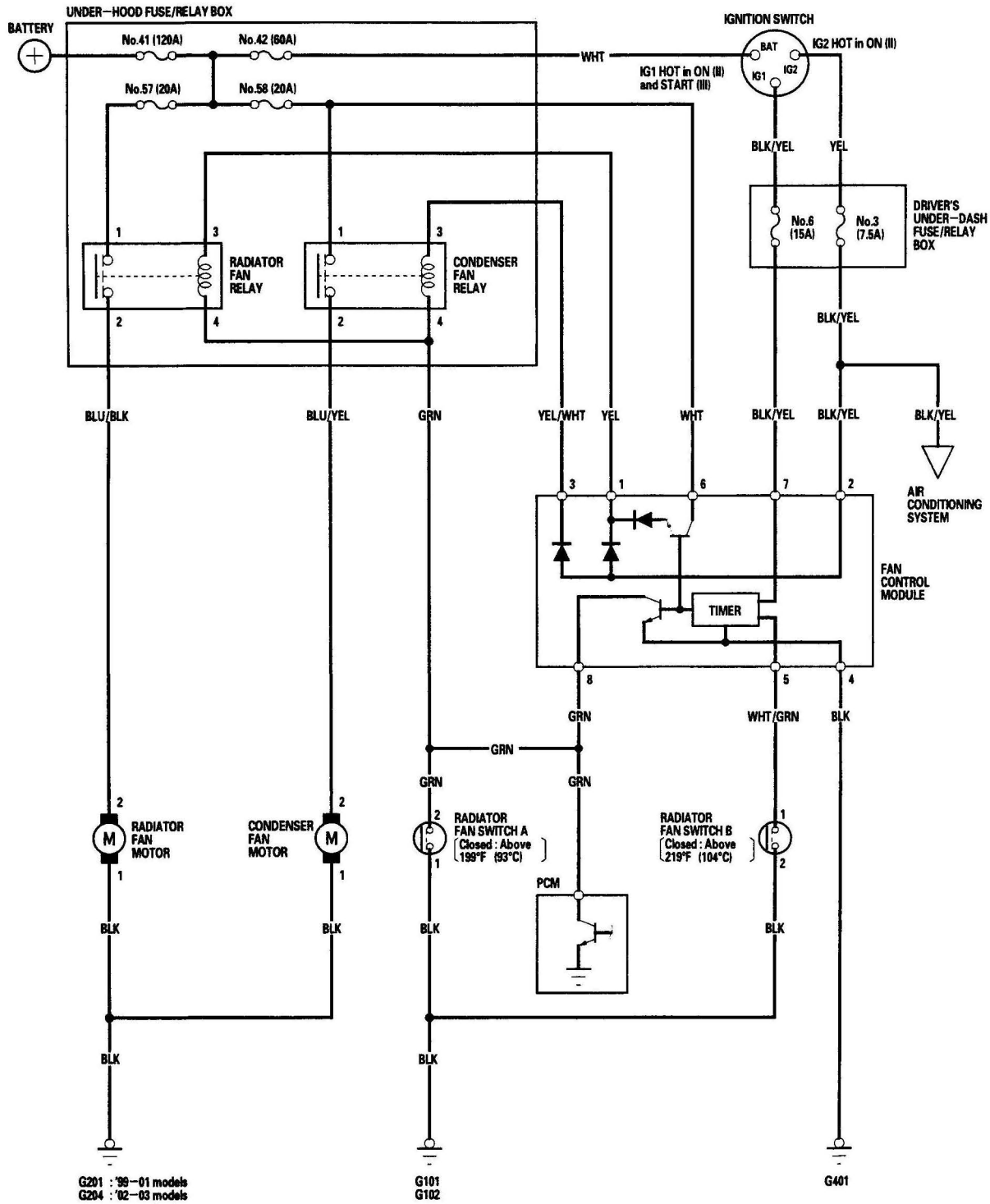
BACK

Protected by AR

Fan Controls

Circuit Diagram

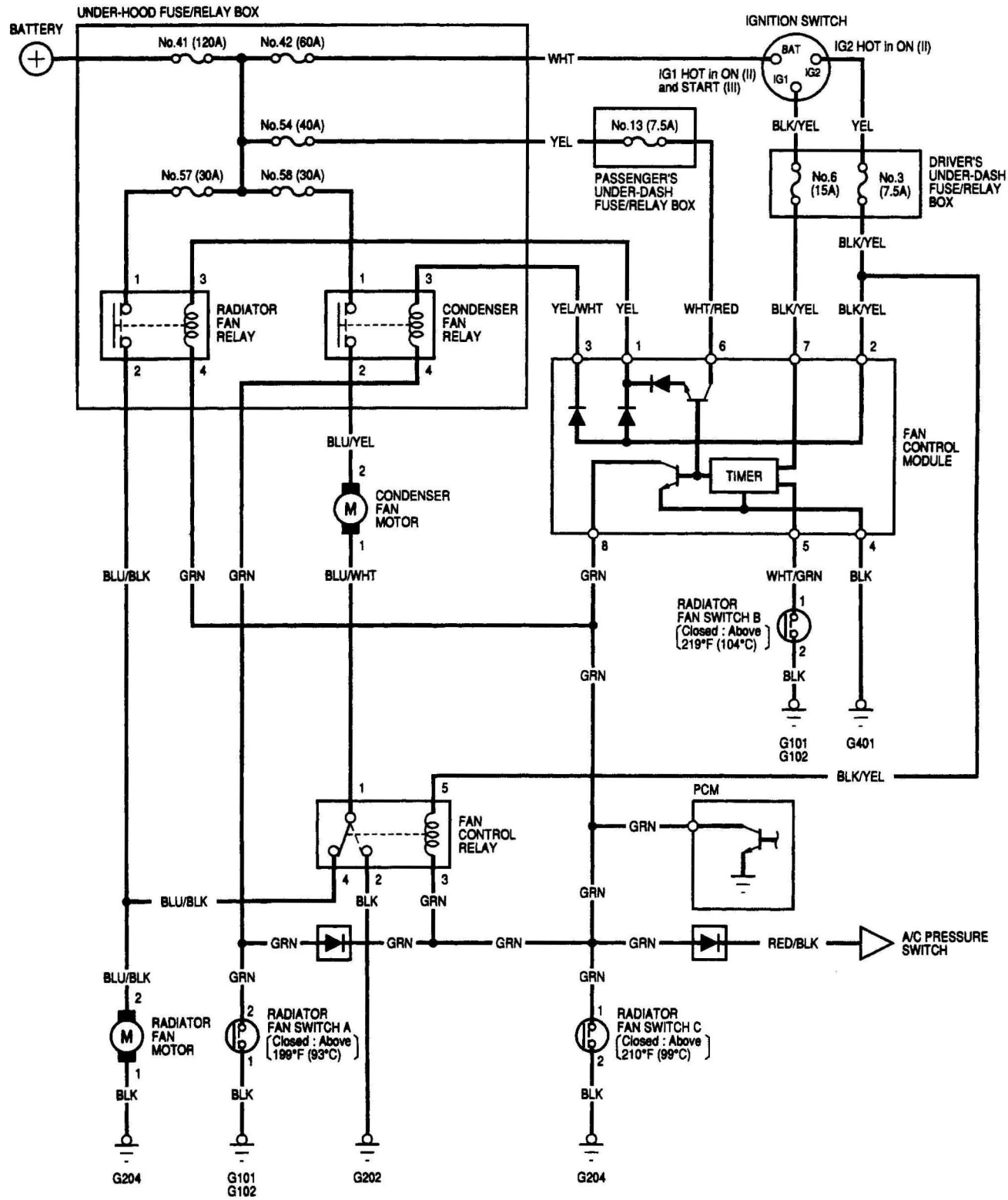
J32A1 engine:



BACK

Protected by AR

J32A2 engine:



BACK

Protected by AR

Radiator Fan Circuit Troubleshooting

1. Check the No. 57 (20A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Check for a short in the wire between the radiator fan relay and radiator fan motor or a faulty fan motor. ■

2. Remove the radiator fan relay from the under-hood fuse/relay box and test it (see page 22-103).

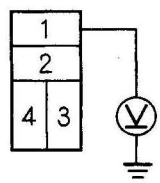
   Is the relay OK?

   YES – Go to step 3.

   NO – Replace radiator fan relay. ■

3. Measure the voltage between radiator fan relay 4P socket terminal No. 1 and body ground.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

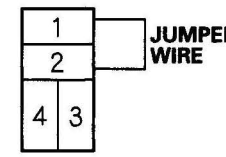
   Is there battery voltage?

   YES – Go to step 4.

   NO – Replace the under-hood fuse/relay box. ■

4. Connect a jumper wire between radiator fan relay 4P socket terminals No. 1 and No. 2.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

   Does the radiator fan run?

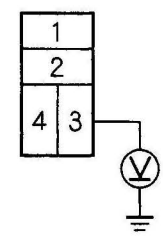
   YES – Go to step 5.

   NO – Go to step 10.

5. Disconnect the jumper wire, and turn the ignition switch ON (II).

6. Measure the voltage between radiator fan relay 4P socket terminal No. 3 and body ground.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

   Is there the battery voltage?

   YES – Troubleshooting the radiator fan switch A circuit (see page 10-24).

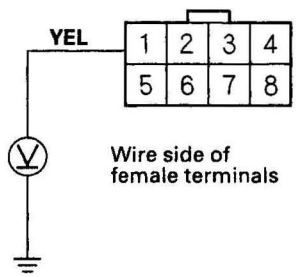
   NO – Go to step 7.

BACK

Protected by AR

7. Measure the voltage between fan control module 8P connector terminal No. 1 and body ground.

FAN CONTROL MODULE 8P CONNECTOR



Is there the battery voltage?

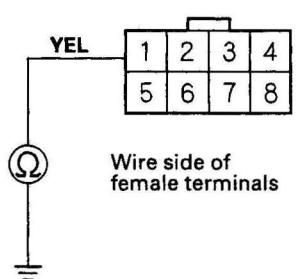
YES – Repair an open in the wire between fan control module terminal No. 1 and radiator fan relay 4P socket terminal No. 3. ■

NO – Go to step 8.

8. Disconnect the fan control module 8P connector.

9. Check for continuity between fan control module 8P connector terminal No. 1 and body ground.

FAN CONTROL MODULE 8P CONNECTOR



Is there the continuity?

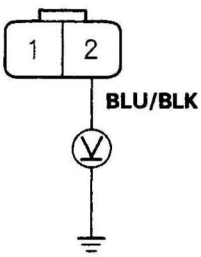
YES – Repair short in the wire between fan control module 8P connector terminal No. 1 and radiator fan relay 4P socket terminal No. 3.
A short on the YEL wire may damage the fan control module. If the symptom is still present after, repairing the short, substitute a known-good fan control module, and recheck. ■

NO – Replace the fan control module. ■

10. Disconnect the radiator fan motor 2P connector.

11. Measure the voltage between fan motor 2P connector terminal No. 2 and body ground.

RADIATOR FAN MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 12.

NO – Repair an open in the wire between radiator fan relay 4P socket terminal No. 2 and radiator 2P connector terminal No. 2. ■

12. Disconnect the jumper wire.

13. Test the radiator fan motor (see page 10-11).

Is the fan motor OK?

YES – Repair an open in the wire between radiator fan motor 2P connector terminal No. 1 and body ground G201 (G204 for '02-03 models). ■

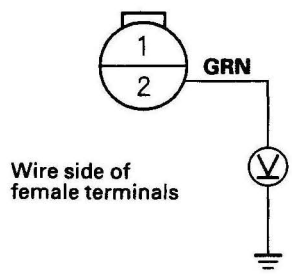
NO – Replace the radiator fan motor. ■

Protected by AR

Radiator Fan Switch A Circuit Troubleshooting

1. Disconnect the radiator fan switch A 2P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the radiator fan switch A 2P connector terminal No. 2 and body ground.

RADIATOR FAN SWITCH A 2P CONNECTOR



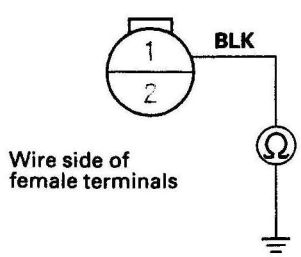
Is there battery voltage?

YES—Go to step 4

NO—Repair open in the wire between the radiator fan switch A connector and under-hood fuse/relay box.■

4. Turn the ignition switch OFF, and check for continuity between the radiator fan switch A 2P connector terminal No. 1 and body ground.

RADIATOR FAN SWITCH A 2P CONNECTOR



Is there continuity?

YES—Replace radiator fan switch A.■

NO—Check for open in the wire between the radiator fan switch A connector and body ground. If the wire is OK, check for poor ground at G101, G102.■

BACK

Protected by AR

Radiator and Condenser Fans Circuit Troubleshooting A

1. Check for the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

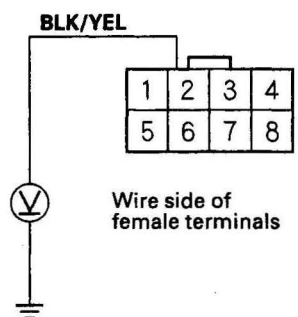
   YES—Go to step 2.

   NO—Check for these problems:
   - A short in the wire between the driver's under-dash fuse/relay box and fan control module 8P connector terminal No. 2.
   - A short in the wire between the driver's under-dash fuse/relay box and fan control relay 5P socket terminal No. 5 (J32A2 engine). ■

2. Turn the ignition switch ON (II).

3. Measure the voltage between fan control module 8P connector terminal No. 2 and body ground.

   FAN CONTROL MODULE 8P CONNECTOR



   Is there battery voltage?

   YES—
   - J32A1 engine: Go to step 7.
   - J32A2 engine: Go to step 4.

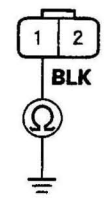
   NO—Repair an open in the wire between the driver's under-dash fuse/relay box and fan control module 8P connector terminal No. 2. ■

4. Turn the ignition switch OFF.

5. Disconnect the radiator fan motor 2P connector.

6. Check for continuity between radiator fan motor 2P connector terminal No. 1 and body ground.

   RADIATOR FAN MOTOR 2P CONNECTOR



   Wire side of female terminals

   Is there continuity?

   YES—Go to step 8.

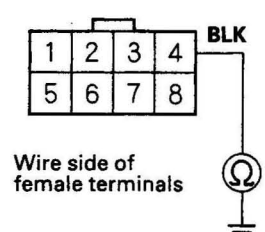
   NO—Check for an open in the wire between radiator fan motor 2P connector terminal No. 1 and G204. If the wire is OK, check for a poor ground at G204. ■

7. Turn the ignition switch OFF.

8. Disconnect the fan control module 8P connector.

9. Check for continuity between fan control module 8P connector terminal No. 4 and body ground.

   FAN CONTROL MODULE 8P CONNECTOR



   Is there continuity?

   YES—Replace the fan control module. Then, if the radiator fan does not run, replace the fan motor. ■

   NO—Repair an open in the wire between fan control module terminal No. 4 and G401. ■

BACK

Protected by AR

Radiator and Condenser Fans Circuit Troubleshooting B

1. Check the No. 57 (30A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Check for a short in the wire between the radiator fan relay, radiator fan motor and fan control relay, and condenser fan motor or a faulty fan motor. ■

2. Remove the radiator fan relay from the under-hood fuse/relay box and test it (see page 22-103).

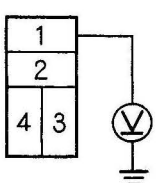
   Is the relay OK?

   YES – Go to step 3.

   NO – Replace radiator fan relay. ■

3. Measure the voltage between radiator fan relay 4P socket terminal No. 1 and body ground.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

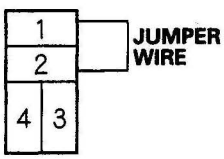
   Is there battery voltage?

   YES – Go to step 4.

   NO – Replace the under-hood fuse/relay box. ■

4. Connect a jumper wire between radiator fan relay 4P socket terminals No. 1 and No. 2.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

   Does the radiator fan run?

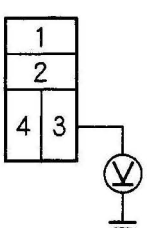
   YES – Go to step 5.

   NO – Go to step 10.

5. Disconnect the jumper wire, and turn the ignition switch ON (II).

6. Measure the voltage between radiator fan relay 4P socket terminal No. 3 and body ground.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

   Is there the battery voltage?

   YES – Repair an open in the wire between the radiator fan relay and the A/C pressure switch. ■

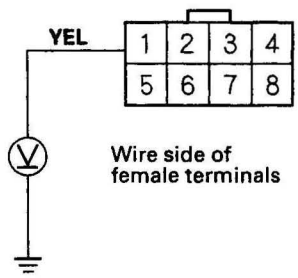
   NO – Go to step 7.

BACK

Protected by AR

7. Measure the voltage between fan control module 8P connector terminal No. 1 and body ground.

FAN CONTROL MODULE 8P CONNECTOR



Is there the battery voltage?

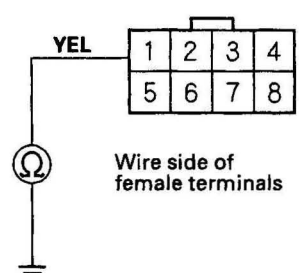
YES – Repair an open in the wire between fan control module terminal No. 1 and radiator fan relay 4P socket terminal No. 3. ■

NO – Go to step 8.

8. Disconnect the fan control module 8P connector.

9. Check for continuity between fan control module 8P connector terminal No. 1 and body ground.

FAN CONTROL MODULE 8P CONNECTOR



Is there the continuity?

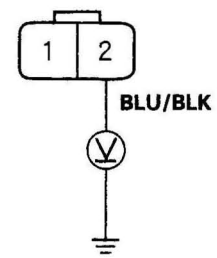
YES – Repair short in the wire between fan control module 8P connector terminal No. 1 and radiator fan relay 4P socket terminal No. 3.
A short on the YEL wire may damage the fan control module. If the symptom is still present after, repairing the short, substitute a known-good fan control module, and recheck. ■

NO – Replace the fan control module. ■

10. Disconnect the radiator fan motor 2P connector.

11. Measure the voltage between fan motor 2P connector terminal No. 2 and body ground.

RADIATOR FAN MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 12.

NO – Repair an open in the wire between radiator fan relay 4P socket terminal No. 2 and radiator 2P connector terminal No. 2. ■

12. Disconnect the jumper wire.

13. Test the radiator fan motor (see page 10-11).

Is the fan motor OK?

YES – Repair an open in the wire between radiator fan motor 2P connector terminal No. 1 and body ground G204. ■

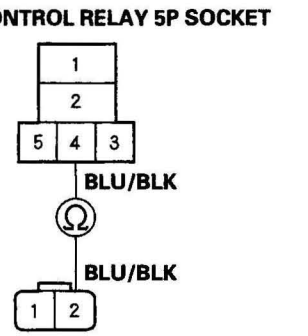
NO – Replace the radiator fan motor. ■

BACK

Protected by AR

Radiator and Condenser Fans Circuit Troubleshooting C

1. Disconnect the fan control relay.
2. Disconnect the radiator fan motor 2P connector.
3. Check for continuity between fan control relay 5P connector terminal No. 4 and radiator fan motor 2P connector terminal No. 2.

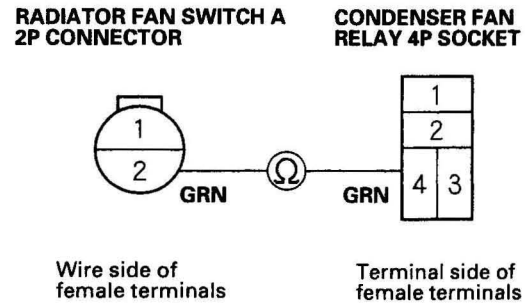


Is there continuity?

YES – Go to step 4.

NO – Repair an open in the wire between fan control relay 5P connector terminal No. 4 and radiator fan motor 2P connector terminal No. 2. ■

4. Remove the condenser fan relay from the under-hood fuse/relay box.
5. Disconnect the radiator fan switch A 2P connector.
6. Check for continuity between condenser fan relay 4P connector terminal No. 4 and radiator fan switch A 2P connector terminal No. 2.

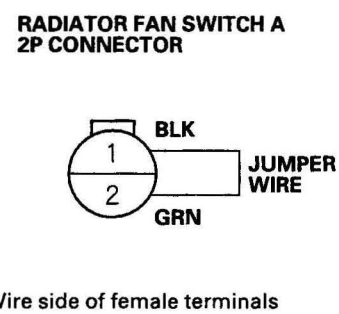


Is there continuity?

YES – Go to step 7.

NO – Repair an open in the wire between condenser fan relay 4P connector terminal No. 4 and radiator fan switch A 2P connector terminal No. 2. ■

7. Install the condenser fan relay.
8. Connect a jumper wire between radiator switch A 2P connector terminals No. 1 and No. 2.



BACK

Protected by AR

9. Turn the ignition switch ON (II).

Does the radiator fan run?

YES – Replace radiator fan switch A and recheck. ■

NO – Repair an open in the wire between radiator fan switch A 2P connector terminal No 1 and ground G101, G102. ■

Protected by AR

Radiator and Condenser Fans Circuit Troubleshooting D

1. Remove the condenser fan relay from the under-hood fuse/relay box and test it (see page 22-103).

   Is the relay OK?

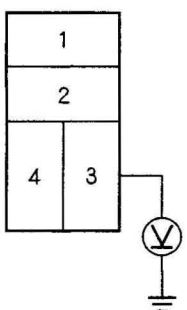
   YES – Go to step 2.

   NO – Replace the condenser fan relay. ■

2. Turn the ignition switch ON (II).

3. Measure the voltage between condenser fan relay 4P socket terminal No. 3 and body ground.

   RADIATOR FAN RELAY 4P SOCKET



   Terminal side of female terminals

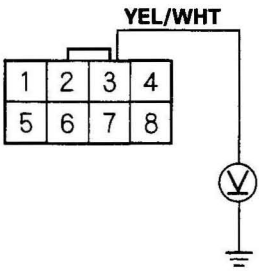
   Is there battery voltage?

   YES – Check these circuits:
   - The wire between condenser fan relay 4P socket terminal No. 4 and radiator fan switch A terminal No. 2.
   - The connection between condenser fan relay 4P socket terminal No. 1 and fuse No. 58 (30A) in the under-hood fuse/relay box.
   - The wire between condenser fan relay 4P socket terminal No. 2 and the condenser fan motor.
   - The wire between the condenser fan motor and the fan control relay. ■

   NO – Go to step 4.

4. Measure the voltage between fan control module 8P connector terminal No. 3 and body ground.

   FAN CONTROL MODULE 8P CONNECTOR



   Wire side of female terminals

   Is there battery voltage?

   YES – Repair an open in the wire between fan control module terminal No. 3 and condenser fan relay 4P socket terminal No. 3. ■

   NO – Replace the fan control module. ■

BACK

Protected by AR

Radiator and Condenser Fans Circuit Troubleshooting E

1. Remove the condensor fan relay, and test it (see page 22-103).

   Is the relay OK?

   YES – Go to step 2.

   NO – Replace the relay. ■

2. Disconnect radiator fan switch C 2P connector and turn the ignition switch ON (II).

   Does the radiator fan stop?

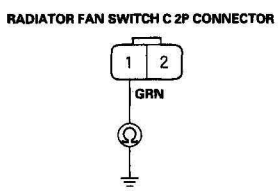
   YES – Replace radiator fan switch C and recheck. ■

   NO – Go to step 3.

3. Turn the ignition switch OFF.

4. Remove the radiator fan relay from the under-hood fuse/relay box.

5. Check for continuity between radiator fan switch C 2P connector terminal No. 1 and body ground.



Wire side of female terminals

   Is there continuity?

   YES – Repair a short in the wire between radiator fan relay 4P socket terminal No. 4, radiator fan switch C 2P connector terminal No. 1 and A/C pressure switch. ■

   NO – Go to step 6.

6. Disconnect the radiator fan switch A 2P connector and turn the ignition switch ON (II).

   Does the radiator fan stop?

   YES – Replace radiator fan switch A. ■

   NO – Repair a short in the wire between radiator fan relay 4P socket terminal No. 4, condenser fan relay 4P socket terminal No. 4. ■

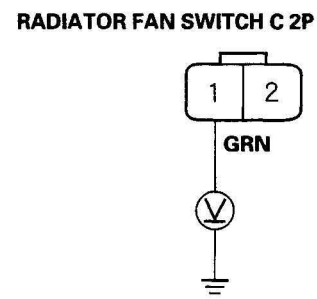
Radiator and Condenser Fans High Speed Circuit Troubleshooting

1. Remove the radiator fan relay and condenser fan relay from the under-hood fuse/relay box.

2. Disconnect the radiator fan switch C 2P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between radiator fan switch C 2P connector terminal No. 1 and body ground.



Wire side of female terminals

   Is there the battery voltage?

   YES – Go to step 5.

   NO – Repair an open in the wire between fan control relay 5P socket terminal No. 3 and radiator fan switch C terminal No. 1. ■

5. Install the radiator fan relay and condenser fan relay.

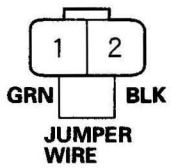
(cont'd)

Protected by AR

Radiator and Condenser Fans High Speed Circuit Troubleshooting (cont'd)

6. Connect a jumper wire between radiator fan switch C 2P connector terminals No. 1 and No. 2.

RADIATOR FAN SWITCH C 2P CONNECTOR



Wire side of female terminals

7. Turn the ignition switch ON (II).

Do the radiator and condenser fans run?

YES – Replace radiator fan switch C. ■

NO – Repair an open in the wire between radiator fan switch C 2P connector terminal No. 2 and ground G204. ■

BACK

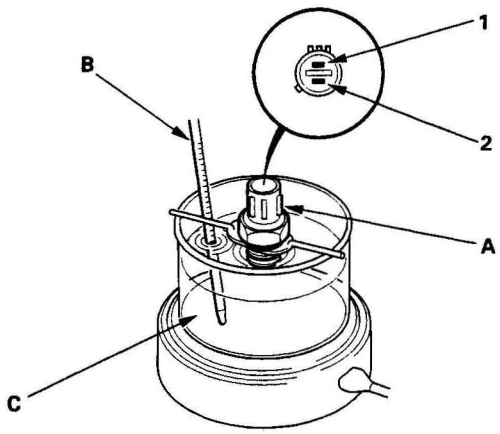
Protected by AR

Radiator Fan Switch Test

NOTE: Bleed air from the cooling system after installing the radiator fan switch (see page 10-13).

1. Remove radiator fan switch A from the water passage (see page 10-33), remove radiator fan switch B from the cylinder head (see page 10-34), and remove radiator fan switch C from the radiator (see page 10-34).

2. Suspend each radiator fan switch (A) in a container of water (C) as shown.



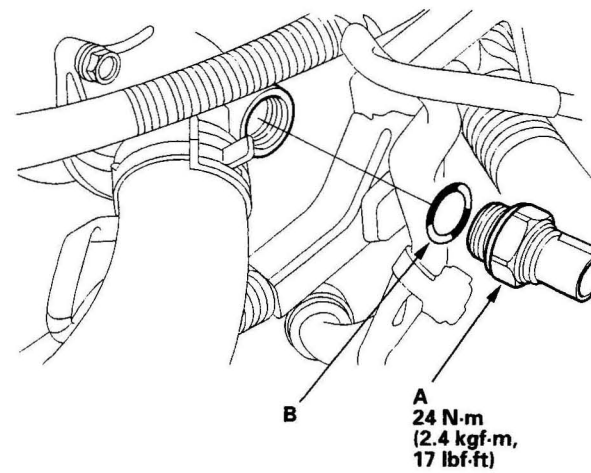
3. Heat the water, and check the temperature with a thermometer (B). Do not let the thermometer touch the bottom of the hot container.

4. Measure the continuity between terminal 1 and terminal 2 according to the table.

Operation		Temperature	Terminal 1	Terminal 2
SWITCH A	ON	196—203°F (91—95°C)	○—○	
	OFF	5—15°F (3—8°C) lower than the temperature when it goes on		
SWITCH B	ON	212—226°F (100—108°C)	○—○	
	OFF	5—23°F (3—13°C) lower than the temperature when it goes on		
SWITCH C	ON	205—216°F (96—102°C)	○—○	
	OFF	5—23°F (3—13°C) lower than the temperature when it goes on		

Radiator Fan Switch A Replacement

1. Disconnect the radiator fan switch A connector, then remove radiator fan switch A (A).



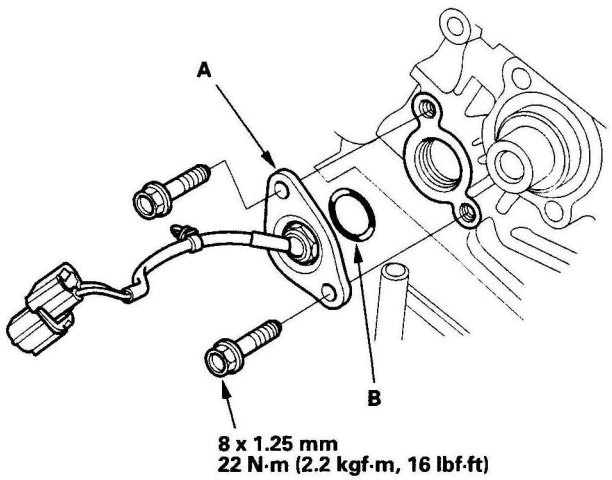
2. Install radiator fan switch A with a new O-ring (B).

BACK

Protected by AR

Radiator Fan Switch B Replacement

1. Set the No. 1 piston at top dead center (TDC) (see page 6-18).
2. Remove the upper covers.
3. To hold the timing adjuster in its current position, thread in the battery clamp bolt hand-tight (see step 14 on page 6-20).
4. Loosen the idler pulley bolt about five or six turns, then remove the timing belt from the front camshaft pulley (see step 16 on page 6-21).
5. Remove the front camshaft pulley (see step 5 on page 6-59).
6. Disconnect the camshaft position (CMP) sensor A/B (TDC sensor 1/2) connector, then remove the back cover (see step 6 on page 6-59).
7. Disconnect the radiator fan switch B connector, then remove radiator fan switch B (A).

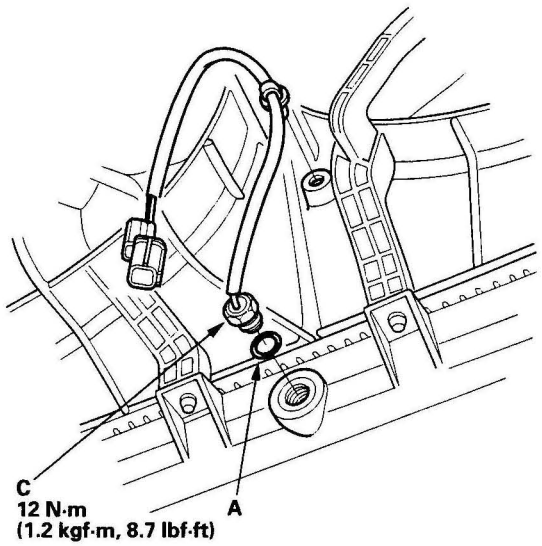


8. Install radiator fan switch B using a new O-ring (B).

Radiator Fan Switch C Replacement

J32A2 Engine:

1. Disconnect the radiator fan switch C connector, then remove radiator fan switch C.



2. Install radiator fan switch C with a new O-ring (A).

BACK

Protected by AR

Fuel and Emissions

Fuel and Emissions Systems

Special Tools 11-2
General Troubleshooting Information 11-3
DTC Troubleshooting Index 11-6
Symptom Troubleshooting Index 11-9
System Descriptions 11-10
How to Set Readiness Codes 11-91

PGM-FI System

Component Location Index 11-93
DTC Troubleshooting 11-96
MIL Circuit Troubleshooting ... 11-136
DLC Circuit Troubleshooting .. 11-140
Injectors Replacement 11-142
HO2S Replacement 11-146

Idle Control System

Component Location Index 11-147
DTC Troubleshooting 11-148
A/C Signal Circuit Troubleshooting 11-151
Alternator FR Signal Circuit Troubleshooting 11-153
Starter Switch Signal Circuit Troubleshooting 11-154
PSP Switch Signal Circuit Troubleshooting 11-155
Brake Pedal Position Switch Signal Circuit Troubleshooting 11-156
Idle Speed Adjustment 11-157
PCM Idle Learn Procedure 11-158

Fuel Supply System

Component Location Index 11-159
PGM-FI Main Relay Circuit Troubleshooting 11-160
Fuel Pressure Relieving 11-163
Fuel Pressure Test 11-164
Fuel Pump Test 11-166
Fuel Lines Inspection 11-167
Fuel Tube/Quick-Connect Fittings Precaution 11-169
Fuel Tube/Quick-Connect Fittings Removal 11-169
Fuel Tube/Quick-Connect Fittings Installation 11-170
Fuel Pressure Regulator Replacement 11-172
Fuel Filter Replacement 11-173
Fuel Pump Replacement 11-175
Fuel Tank Replacement 11-176
Fuel Gauge Test 11-179
Fuel Gauge Sending Unit Test/Replacement 11-180
Low Fuel Indicator Light Test 11-181

Intake Air System

Component Location Index 11-182
Throttle Body Test 11-184
Intake Air Bypass Control Valve Test 11-184
Heated Air Induction System Test 11-185
Air Cleaner Element Replacement 11-186
Air Cleaner Housing Disassembly/Reassembly ... 11-187
Throttle Cable Adjustment 11-188
Throttle Body Removal/ Installation 11-189
Throttle Body Disassembly/ Reassembly 11-190
IMRC System Troubleshooting 11-191
IMRC Valve Inspection 11-193
IMRC Actuator Cable Adjustment 11-194
IMRC Actuator Removal/Installation 11-194
IMRC Module Unit Removal/Installation 11-195

Catalytic Converter System

DTC Troubleshooting 11-196
Tailpipe Emissions Test 11-196

EGR System

DTC Troubleshooting 11-197

PCV System

PCV Valve Inspection and Test 11-202

EVAP System

Component Location Index 11-203
DTC Troubleshooting 11-204
Fuel Tank Vapor Control Valve Test 11-219
Fuel Tank Vapor Control Valve Replacement 11-221



Protected by AR

Special Tools

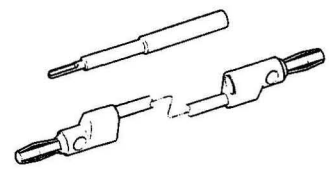
Ref. No.	Tool Number	Description	Qty
①	A973X-041-XXXXX	Vacuum Pump/Gauge, 0 – 30 in.Hg	1
②	07JAZ-001000B	Vacuum/Pressure Gauge, 0 – 4 in.Hg	1
③	07SAZ-001000A	Backprobe Set	2
④	07VAJ-0040100	Fuel Pressure Gauge Attachment	1
⑤	07406-004000A	Fuel Pressure Gauge	1



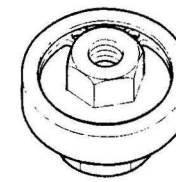
①



②



③



④



⑤

BACK

Protected by AR

General Troubleshooting Information

Intermittent Failures

The term "intermittent failure" means a system may have had a failure, but it checks OK now. If the Malfunction Indicator Lamp (MIL) on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting.

Opens and Shorts

"Open" and "Short" are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something won't work at all. In complex electronics (like PCM's) this can sometimes mean something works, but not the way it's supposed to.

How to Use the PGM Tester or a Scan Tool

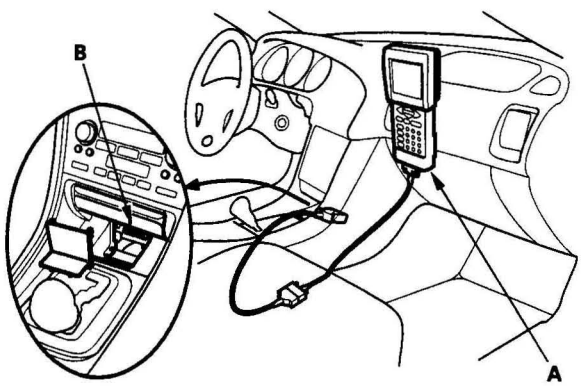
If the MIL (Malfunction Indicator Lamp) has come on

1. Start the engine and check the MIL.

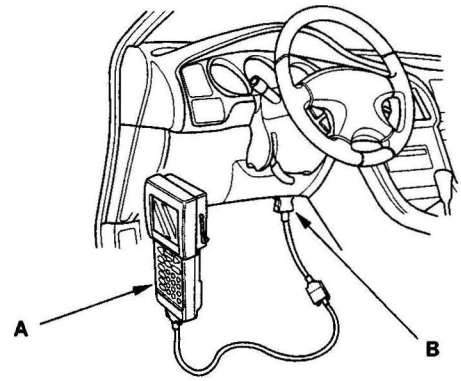
   NOTE: If the ignition switch is turned ON (II), and the engine is not started, the MIL will stay on for 15 −20 seconds on '01-03 models (2 seconds on '99-00 models).

2. If the MIL stays on, connect the Honda PGM Tester (A) or an OBD II scan tool to the Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind driver's dashboard lower cover ('03 model).

   '99-02 models:



'03 model:



3. Turn the ignition switch ON (II).

4. Check the Diagnostic Trouble Code (DTC) and note it. Also check the freeze data. Refer to the DTC Trouobleshooting Index and begin the appropriate troubleshooting procedure.

NOTE:
- Freeze data indicates the engine conditions when the first malfunction, misfire or fuel trim malfunction was detected.
- The scan tool and the Honda PGM Tester can read the DTC, freeze data, current data, and other Powertrain Control Module (PCM) data.
- For specific operations, refer to the user's manual that came with the scan tool or Honda PGM Tester.

If the MIL did not come on
If the MIL did not come on, but there is a driveablility problem, refer to the Symptom Troubleshooting index in this section.

If you can't duplicate the DTC
Some of the troubleshooting in this section requires you to reset the PCM and try to duplicate the DTC. If the problem is intermittent and you can't duplicate the code, do not continue through the procedure. To do so will only result in confusion and, possibly, a needlessly replaced PCM.

(cont'd)

Protected by AR

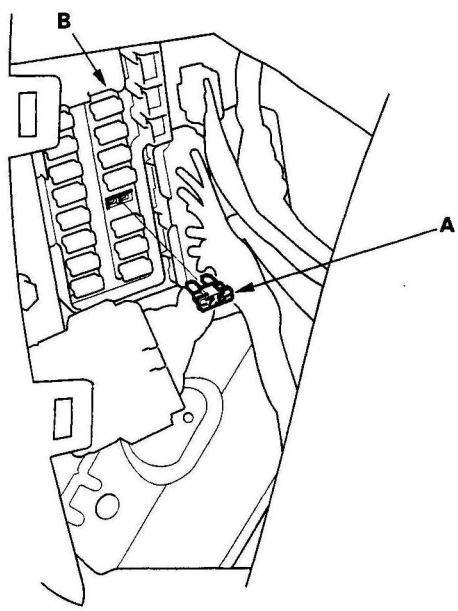
General Troubleshooting Information (cont'd)

How to Reset the PCM

You can reset the PCM in either of two ways:

- Use the OBD II scan tool or Honda PGM Tester to clear the PCM's memory.
  See the OBD II scan tool or Honda PGM Tester user's manuals for specific instructions.
- Turn the ignition switch OFF, and remove the No.13 CLOCK BACKUP fuse (7.5A) (A) from the passenger's under-dash fuse/relay box (B) for 10 seconds.

NOTE: After resetting the PCM, do the PCM idle learn procedure (see page 11-158).



How to End a Troubleshooting Session (required after any troubleshooting)

1. Reset the PCM as described above.
2. Do the PCM idle learn procedure (see page 11-158).
3. Disconnect the OBD II scan tool or Honda PGM Tester from the DLC.

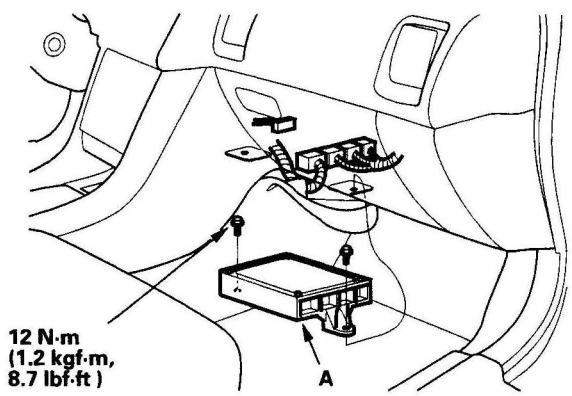
   NOTE: The PCM is part of the immobilizer system. If you replace the PCM, it will have a different immobilizer code. In order for the engine to start, you must rewrite the immobilizer code with the Honda PGM Tester.

How to Remove the PCM for Testing

If the inspection for a trouble code requires voltage or resistance checks at the PCM connectors, remove the PCM and test it:

1. Pull back the carpet from the passenger's and driver's side of the center console to expose the PCM.
2. Remove the two bolts from the PCM (A).

   NOTE: After removing the PCM, do the PCM idle learn procedure (see page 11-158).



BACK

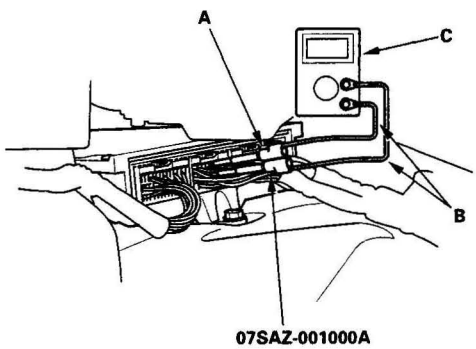
Protected by AR

How to Troubleshoot Circuits at the PCM

Special Tools Required

- Digital Multimeter KS-AHM-32-003 (1) or a commercially available digital multimeter
- Backprobe Set 07SAZ-001000A (2)

1. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a digital multimeter (C).

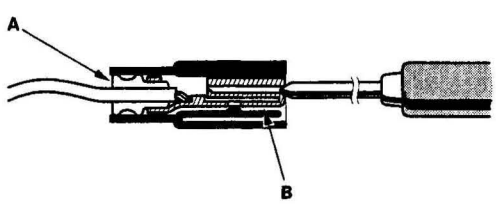


2. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it touches the end of the wire terminal.

3. If you cannot get to the wire side of the connector or the wire side is sealed (A), disconnect the connector and probe the terminals (B) from the terminal side. Do not force the probe into the connector.

NOTICE

Do not puncture the insulation on a wire. Punctures can cause poor or intermittent electrical connections.



How to substitute the PCM for testing purposes

Use this procedure if you need a known-good PCM to test a vehicle. It allows you to swap a PCM from a "donor" vehicle without having to program it to the test vehicle's ignition key.

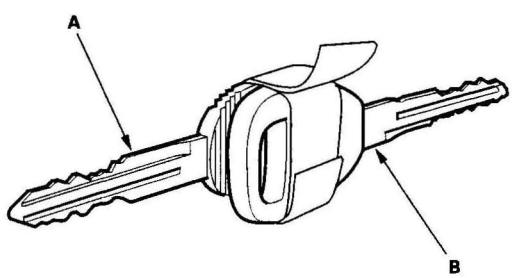
1. Cut a temporary ignition key for the test vehicle with a non-immobilizer key blank.

2. Remove the PCM from the test vehicle.

3. Write the test vehicle's VIN on the PCM you just removed to avoid confusing it with the donor vehicle's PCM.

4. Remove the known-good PCM from the donor vehicle, and install it in the test vehicle.

5. Tape the donor vehicle's ignition key head-to-head to the test vehicle's temporary key (A). The PCM will recognize the code from the donor vehicle's key (B) and allow you to start the engine with the temporary key.



6. After completing your tests, reinstall both PCMs, and destroy the temporary key.

BACK

Protected by AR

DTC Troubleshooting Index

DTC (MIL indication*1)	Temporary DTC	Detection Item	Note
P0107 (3)	———	Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	(see page 11-96)
P0108 (3)	———	Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	(see page 11-97)
P0112 (10)	———	Intake Air Temperature (IAT) Sensor Circuit Low Voltage	(see page 11-99)
P0113 (10)	———	Intake Air Temperature (IAT) Sensor Circuit High Voltage	(see page 11-100)
P0116 (86)	P0116	Engine Coolant Temperature (ECT) Sensor Range/Performance Problem	(see page 11-101)
P0117 (6)	———	Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage	(see page 11-101)
P0118 (6)	———	Engine Coolant Temperature (ECT) Sensor Circuit High Voltage	(see page 11-103)
P0122 (7)	———	Throttle Position (TP) Sensor Circuit Low Voltage	(see page 11-104)
P0123 (7)	———	Throttle Position (TP) Sensor Circuit High Voltage	(see page 11-106)
P0128 (87)*3	———	Thermostat Range/Performance Problem	(see page 11-108)
P0131 (1)	P0130	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Circuit Low Voltage	(see page 11-109)
P0132 (1)	P0130	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Circuit High Voltage	(see page 11-110)
P0133 (61)	P0133	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Slow Response	(see page 11-111)
P0135 (41)	———	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Heater Circuit Malfunction	(see page 11-115)
P0137 (63)	P0136	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Circuit Low Voltage	(see page 11-112)
P0138 (63)	P0136	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) High Voltage	(see page 11-113)
P0139 (63)	P0136	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Slow Response	(see page 11-114)
P0141 (65)	———	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Heater Circuit Malfunction	(see page 11-115)
P0171 (45)	P0170	Fuel System Too Lean	(see page 11-117)
P0172 (45)	P0170	Fuel System Too Rich	(see page 11-117)
P0300 and some of P0301 (71) P0302 (72) P0303 (73) P0304 (74) P0305 (75) P0306 (76)	P1399	Random Misfire	(see page 11-118)

*1: These DTCs are indicated by a blinking Malfunction Indicator Lamp (MIL) when the SCS service signal line is jumped with the Honda PGM tester.
*2: The D4 ('99 model), D5 ('00-03 models) indicator and the MIL may come on simultaneously.
*3: '03 model

BACK

Protected by AR

DTC (MIL indication*1)	Temporary DTC	Detection Item	Note
P0301 (71)	P1399	No. 1 Cylinder Misfire	(see page 11-119)
P0302 (72)	P1399	No. 2 Cylinder Misfire	(see page 11-119)
P0303 (73)	P1399	No. 3 Cylinder Misfire	(see page 11-119)
P0304 (74)	P1399	No. 4 Cylinder Misfire	(see page 11-119)
P0305 (75)	P1399	No. 5 Cylinder Misfire	(see page 11-119)
P0306 (76)	P1399	No. 6 Cylinder Misfire	(see page 11-119)
P0325 (23)	———	Knock Sensor Circuit Malfunction	(see page 11-124)
P0335 (4)	———	Crankshaft Position (CKP) Sensor No Signal	(see page 11-125)
P0336 (4)	———	Crankshaft Position (CKP) Sensor Intermittent Interruption	(see page 11-125)
P0401 (80)	P0401	Exhaust Gas Recirculation (EGR) Insufficient Flow	(see page 11-197)
P0420 (67)	———	Catalyst System Efficiency Below Threshold	(see page 11-196)
P0451 (91)	P0451	Fuel Tank Pressure (FTP) Sensor Range/ Performance Problrm	(see page 11-204)
P0452 (91)	P0450	Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage	(see page 11-205)
P0453 (91)	P0450	Fuel Tank Pressure (FTP) Sensor Circuit High Voltage	(see page 11-206)
P0505 (14)	P0505	Idle Control System Malfunction	(see page 11-148)
P07xx*2 (70)	———	Automatic Transaxle System Malfunction	Refer to the Automatic Transmission DTC Troubleshooting Index
P1106 (13)	P1106	Barometric Pressure (BARO) Sensor Range/Performance Problem	(see page 11-127)
P1107 (13)	———	Barometric Pressure (BARO) Sensor Circuit Low Voltage	(see page 11-127)
P1108 (13)	———	Barometric Pressure (BARO) Sensor Circuit High Voltage	(see page 11-127)
P1121 (7)	P1121	Throttle Position (TP) Sensor Lower Than Expected	(see page 11-107)
P1122 (7)	P1122	Throttle Position (TP) Sensor Higher Than Expected	(see page 11-107)
P1128 (5)	P1128	Manifold Absolute Pressure (MAP) Sensor Lower Than Expected	(see page 11-98)
P1129 (5)	P1129	Manifold Absolute Pressure (MAP) Sensor Higher Than Expected	(see page 11-98)
P1259 (22)	———	VTEC System Malfunction	(see page 6-6)

*1: These DTCs are indicated by a blinking MIL when the SCS service signal line is jumped with the Honda PGM Tester.

*2: The D4 ('99 model), D5 ('00-03 models) indicator and the MIL may come on simultaneously.

(cont'd)

BACK

Protected by AR

DTC Troubleshooting Index (cont'd)

DTC (MIL indication*1)	Temporary DTC	Detection Item	Page
P1297 (20)	———	Electrical Load Detector (ELD) Circuit Low Voltage	(see page 11-128)
P1298 (20)	———	Electrical Load Detector (ELD) Circuit High Voltage	(see page 11-129)
P1361 (8)	———	Camshaft Position (CMP) Sensor (Top Dead Center (TDC) Sensor) A Intermittent Interruption	(see page 11-131)
P1362 (8)	———	Camshaft Position (CMP) Sensor (Top Dead Center (TDC) Sensor) A No Signal	(see page 11-131)
P1366 (58)	———	Camshaft Position (CMP) Sensor (Top Dead Center (TDC) Sensor) B Intermittent Interruption	(see page 11-131)
P1367 (58)	———	Camshaft Position (CMP) Sensor (Top Dead Center (TDC) Sensor) B No Signal	(see page 11-131)
P1456 (90)	P1456	Evaporative Emission (EVAP) Control System Leakage (Fuel Tank System)	(see page 11-208)
P1457 (90)	P1457	Evaporative Emission (EVAP) Control System Leakage (EVAP Canister System)	(see page 11-213)
P1486 (87)	———	Thermostat Range/Performance Problem	(see page 11-132)
P1491 (12)	P1491	Exhaust Gas Recirculation (EGR) Valve Insufficient Lift	(see page 11-197)
P1498 (12)	———	Exhaust Gas Recirculation (EGR) Valve Position Sensor Circuit High Voltage	(see page 11-201)
P1519 (14)	———	Idle Air Control (IAC) Valve Circuit Malfunction	(see page 11-149)
P1607 (—)	———	Powertrain Control Module (PCM) Internal Circuit Malfunction	(see page 11-135)
P1656*2,*4 (70)	———	Automatic Transaxle	Refer to the Automatic Transmission DTC Troubleshooting Index
P1676 (35)	———	FPTDR Signal Line Malfunction	for '99 model (see page 11-133) or for '00-03 models (see page 11-134)
P1678 (35)	———	FPTDR Signal Line Malfunction	(see page 11-135)
P17xx*2 (70)	(P17xx)	Automatic Transaxle System Malfunction	Refer to the Automatic Transmission DTC Troubleshooting Index

*1: These DTCs are indicated by the blinking MIL when the SCS service signal line is jumped with the Honda PGM Tester.
*2: The D4 ('99 model), D5 ('00-03 models) indicator and the MIL may come on simultaneously.
*4: J32A2 engine

BACK

Protected by AR

Symptom Troubleshooting Index

These symptoms DO NOT trigger Diagnostic Trouble codes (DTCs) and cause the Malfunction Indicator Lamp (MIL) to come on. If the MIL is reported on, check for DTCs. If the vehicle has one of these symptoms, do the diagnostic procedure for it, in the sequence listed, until you find the cause.

Symptom	Diagnostic procedure	Also check for
Engine will not start (MIL works OK, no DTCs set)	1. Test the battery (see page 22-102). 2. Test the starter (see page 4-7). 3. Test the fuel pressure (see page 11-164). 4. Troubleshoot the PGM-FI main relay circuit (see page 11-160).	• Low compression • No ignition spark • Intake air leaks • Locked up engine • Slipped/ broken timing belt • Contaminated fuel
Engine will not start (MIL comes on and stays on, or never comes on at all, no DTCs set)	Troubleshoot the MIL circuit (see page 11-136).	
Engine will not start (immobilizer indicator light comes on)	Troubleshoot the immobilizer system (see page 22-293).	
Hard starting (MIL works OK, no DTCs set)	1. Test the battery (see page 22-102). 2. Check the fuel pressure (see page 11-164).	• Low compression • Intake air leaks • Contaminated fuel • Weak spark
Cold fast idle too low (MIL works OK, no DTCs set)	Check/adjust the idle speed (see page 11-157).	
Cold fast idle too high (MIL works OK, no DTCs set)	1. Check/adjust the idle speed (see page 11-157). 2. Inspect/adjust the throttle cable (see page 11-188). 3. Inspect and test the throttle body (see page 11-184).	
Idle speed fluctuates (MIL works OK, no DTCs set)	1. Check/adjust the idle speed (see page 11-157). 2. Inspect/adjust the throttle cable (see page 11-188). 3. Inspect and test the throttle body (see page 11-184).	Intake air leaks
Low power (MIL works OK, no DTCs set)	1. Check the fuel pressure (see page 11-164). 2. Inspect and test the throttle body (see page 11-184). 3. Inspect/adjust the throttle cable (see page 11-188).	Low compression
Engine stalls (MIL works OK, no DTCs set)	1. Check the fuel pressure (see page 11-164). 2. Check/adjust the idle speed (see page 11-157). 3. Troubleshoot the brake pedal position switch signal circuit.	• Intake air leaks • Faulty harness and sensor connections
Difficult to refuel (MIL works OK, no DTCs set)	1. Test the fuel tank vapor control valve (see page 11-219). 2. Inspect the fuel tank signal tube between the fuel pipe and the fuel tank vapor control valve. 3. Inspect the fuel tank vapor vent tube between the EVAP canister and the fuel tank vapor control valve. 4. Check the EVAP canister.	
Fuel overflows during refueling (No DTCs set)	Replace the fuel tank vapor control valve (see page 11-221).	

BACK

Protected by AR

System Descriptions

Electronic Control System

The functions of the fuel and emission control systems are managed by the powertrain control module (PCM).

Fail-safe Function
When an abnormality occurs in a signal from a sensor, the PCM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.

Back-up Function
When an abnormality occurs in the PCM, the injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.

Self-diagnosis
When an abnormality occurs in the signal from a sensor, the PCM supplies ground for the Malfunction Indicator Lamp (MIL) and stores the Diagnostic Trouble Code (DTC) in erasable memory. When the ignition is first turned on, the PCM supplies ground to the MIL for 15 to 20 seconds on '01-03 models (2 seconds on '99-00 models) to check the MIL bulb condition.

Two Driving Cycle Detection Method
To prevent false indications, the "two driving cycle detection method" is used for some self-diagnostic functions. When an abnormality occurs, the PCM stores it in its memory. When the same abnormality recurs after the ignition switch is turned OFF and ON (II) again, the PCM informs the driver by turning on the MIL.

BACK

Protected by AR

PCM Data

You can retrieve data from the PCM by connecting the OBD II scan tool or the Honda PGM Tester to the Data Link Connector (DLC). The items listed in the table below conform to SAE recommended practice. The Honda PGM Tester also reads data beyond that recommended by SAE. Understanding this data may help you find the causes of intermittent problems.

NOTE:
- The "operating values" listed are approximate and may vary depending on the environment and the individual vehicle.
- Unless noted otherwise, "at idle speed" means idling with the engine completely warmed up, A/T in Park or neutral position, and the A/C and all accessories turned off.

Data	Description	Operating Value	Freeze Data
Diagnostic Trouble Code (DTC)	If the PCM detects a problem, it will store it as a code consisting of one letter and four numbers. Depending on the problem, an SAE-defined code (P0xxx) or a Honda-defined code (P1xxx) will be output to the tester.	If no problem is detected, there is no output.	YES
Engine Speed	The PCM computes engine speed from the signals sent from the Crankshaft Position (CKP) sensor. This data is used for determining the time and amount of injected fuel.	Nearly the same as tachometer indication At idle speed: 680±50 rpm	YES
Vehicle Speed	The PCM converts pulse signals from the countershaft speed sensor into speed data.	Nearly the same as speedometer indication	YES
Manifold Absolute Pressure (MAP)	The absolute pressure caused in the intake manifold by engine load and speed.	With engine stopped: Nearly the same as atmospheric pressure At idle speed: 20–34 kPa (150–260 mmHg, 6–10 in.Hg)	YES
Engine Coolant Temperature (ECT)	The ECT sensor converts coolant temperature into voltage and signals the PCM. The sensor is a thermistor whose internal resistance changes with coolant temperature. The PCM uses the voltage signals from the ECT sensor to determine the amount of injected fuel.	With cold engine: Same as ambient temperature and Intake Air Temperature (IAT) With engine warmed up: about 176–212°F (80–100°C)	YES
Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1), Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2)	The HO2S detects the oxygen content in the exhaust gas and sends voltage signals to the PCM. Based on these signals, the PCM controls the air fuel ratio. When the oxygen content is high (that is, when the ratio is leaner than the stoichiometric ratio), the voltage signal is lower. When the oxygen content is low (that is, when the ratio is richer than the stoichiometric ratio), the voltage signal is higher.	0.0–1.25 V At idle speed: about 0.1–0.9 V	NO

(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

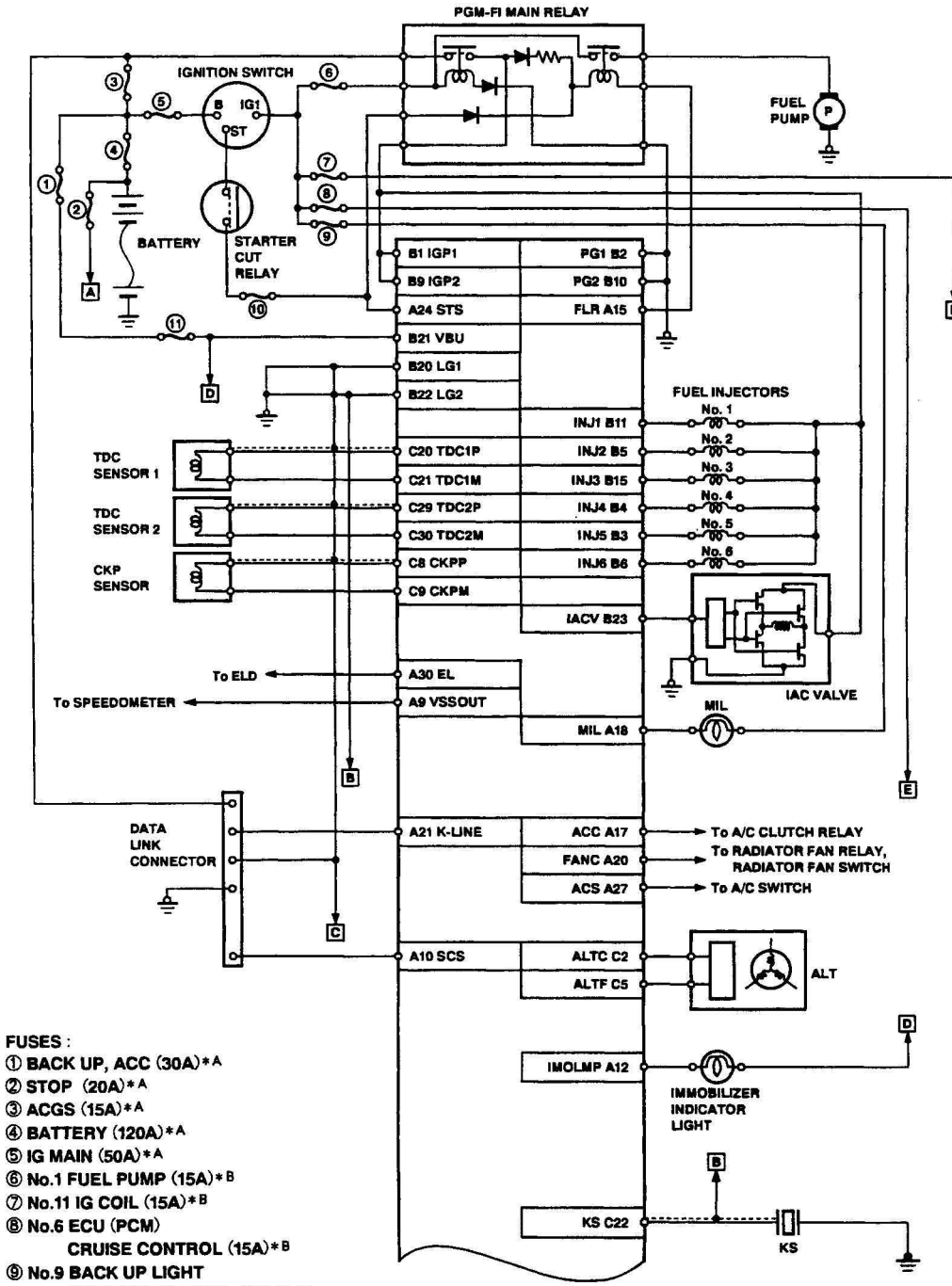
PCM Data (cont'd)

Data	Description	Operating Value	Freeze Data
Fuel System Status	Fuel system status is indicated as "open" or "closed". Closed: Based on the HO2S output, the PCM determines the air/fuel ratio and controls the amount of injected fuel. Open: ignoring HO2S output, the PCM refers to signals from the Throttle Position (TP), Manifold Absolute Pressure (MAP), Intake Air Temperature (IAT), Barometric Pressure (BARO) and Engine Coolant Temperature (ECT) sensors to control the amount of injected fuel.	At idle speed: closed	YES
Short Term Fuel Trim	The air fuel ratio correction coefficient for correcting the amount of injected fuel when the Fuel System Status is "closed". When the ratio is leaner than the stoichiometric ratio, the PCM increase short term fuel trim gradually, and the amount of injected fuel increases. The air fuel ratio gradually gets richer, causing a lower oxygen content in the exhaust gas. Consequently, the short term fuel trim is lowered, and the PCM reduces the amount of injected fuel. This cycle keeps the air/fuel ratio close to the stoichiometric ratio when in closed loop status.	0.73 – 1.47	YES
Long Term Fuel Trim	Long term fuel trim is computed from short term fuel trim and indicates changes occurring in the fuel supply system over a long period. If long term fuel trim is higher than 1.00, the amount of injected fuel must be increased. If it is lower than 1.00, the amount of injected fuel must be reduced.	0.80 – 1.20	YES
Intake Air Temperature (IAT)	The IAT sensor converts intake air temperature into voltage and signals the PCM. When intake air temperature is low, the internal resistance of the sensor increases, and the voltage signal is higher.	With cold engine: Same as ambient temperature and ECT	YES
Throttle Position	Based on the accelerator pedal position, the opening angle of the throttle valve is indicated.	At idle speed: about 10 %	YES
Ignition Timing	Ignition timing is the ignition advance angle set by the PCM. The PCM matches ignition timing to the driving conditions.	At idle speed: 10° ± 2° BTDC with the SCS service signal jumped.	NO
Calculated Load Value (CLV)	CLV is the engine load calculated from the MAP data.	At idle speed: 16 – 33 % At 2,500 rpm with no load: 17 – 25 %	YES

BACK

Protected by AR

PCM Electrical Connections — '99 Model



FUSES :
① BACK UP, ACC (30A)*A
② STOP (20A)*A
③ ACGS (15A)*A
④ BATTERY (120A)*A
⑤ IG MAIN (50A)*A
⑥ No.1 FUEL PUMP (15A)*B
⑦ No.11 IG COIL (15A)*B
⑧ No.6 ECU (PCM)
CRUISE CONTROL (15A)*B
⑨ No.9 BACK UP LIGHT
INSTRUMENT LIGHT (7.5A)*B
⑩ No.13 STARTER SIGNAL (7.5A)*B
⑪ No.13 CLOCK BACKUP (7.5A)*C

*A : in the under-hood fuse/relay box
*B : in the driver's under-dash fuse/relay box
*C : in the passenger's under-dash fuse/relay box

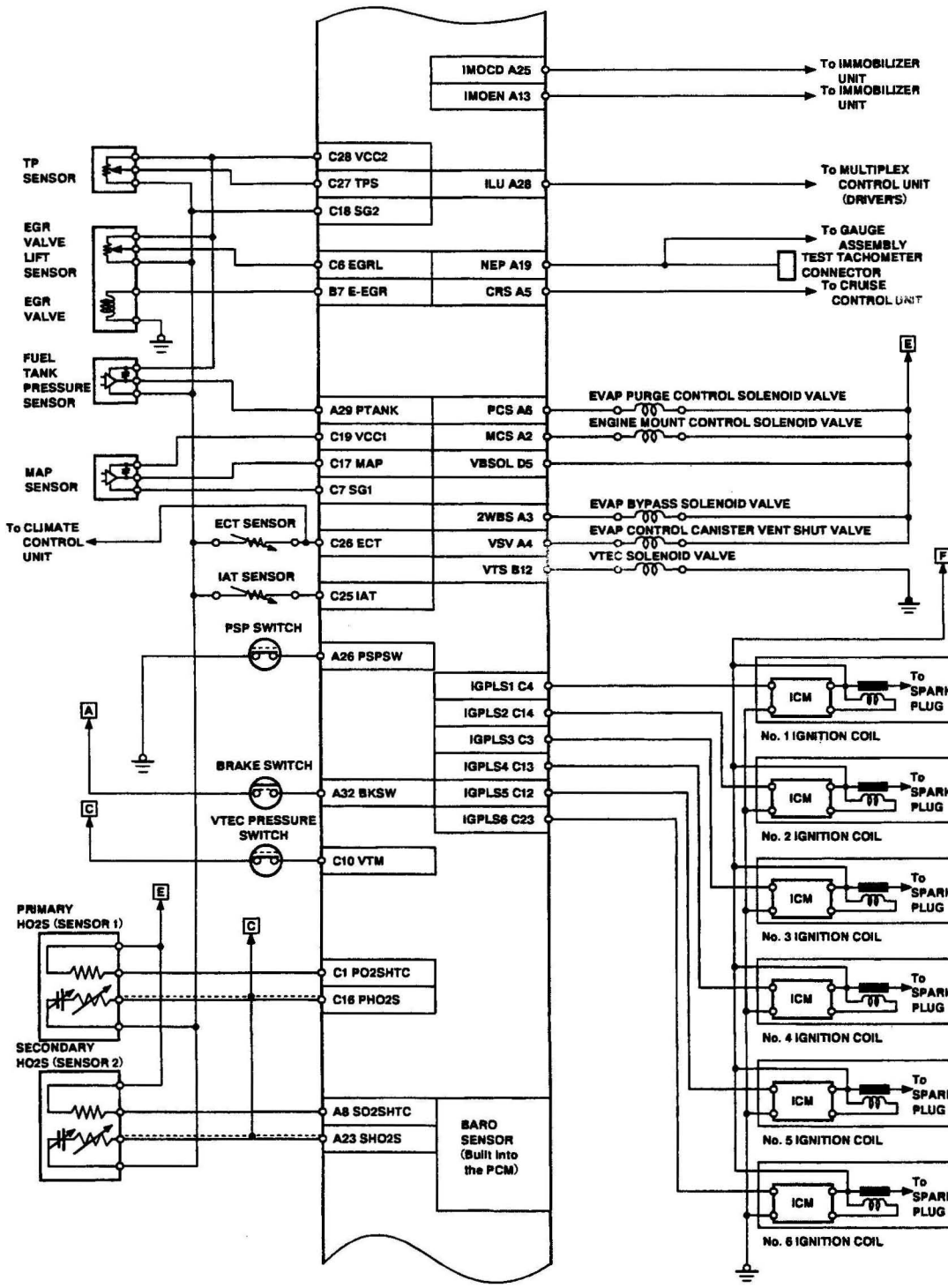
(cont'd)

BACK

Protected by AR

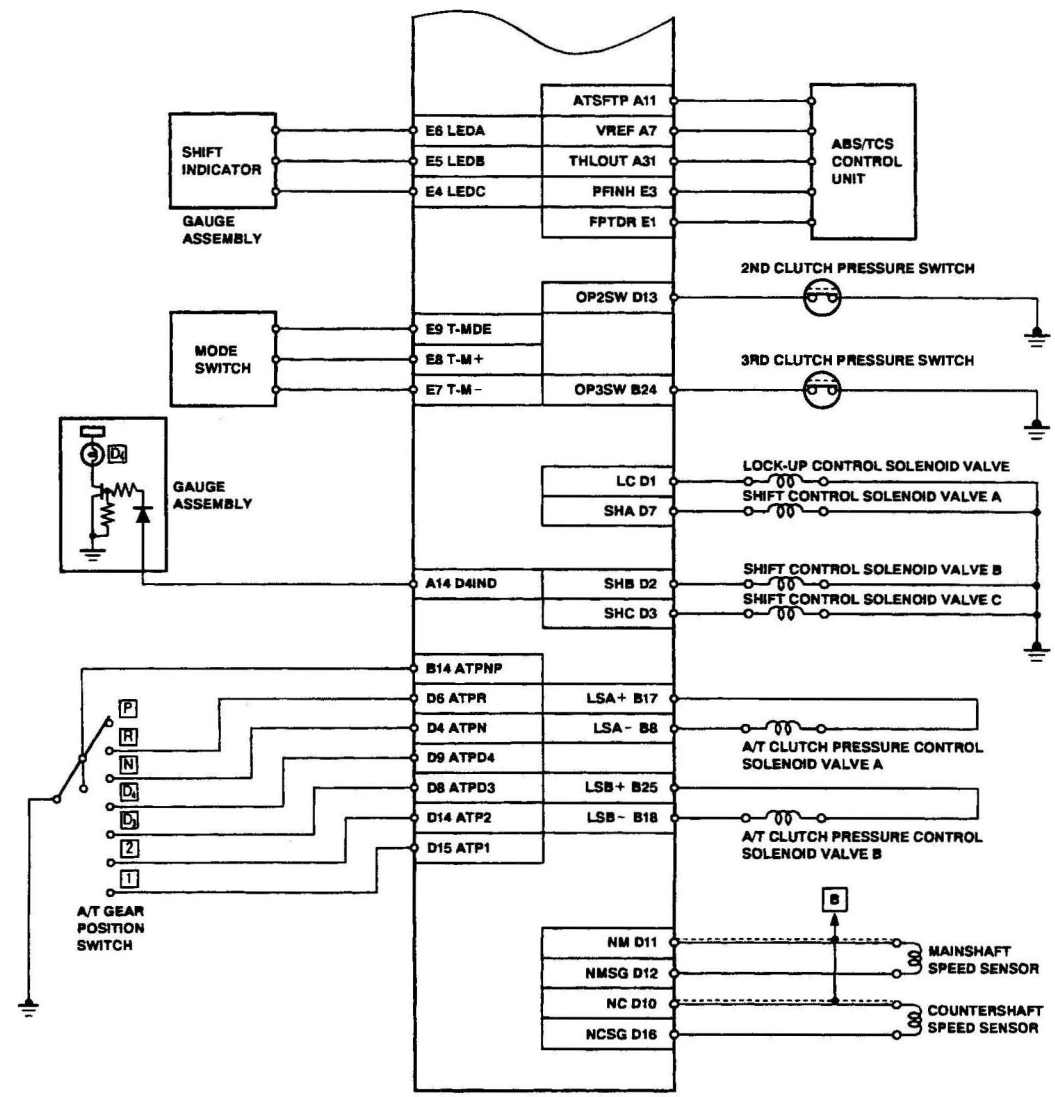
System Descriptions (cont'd)

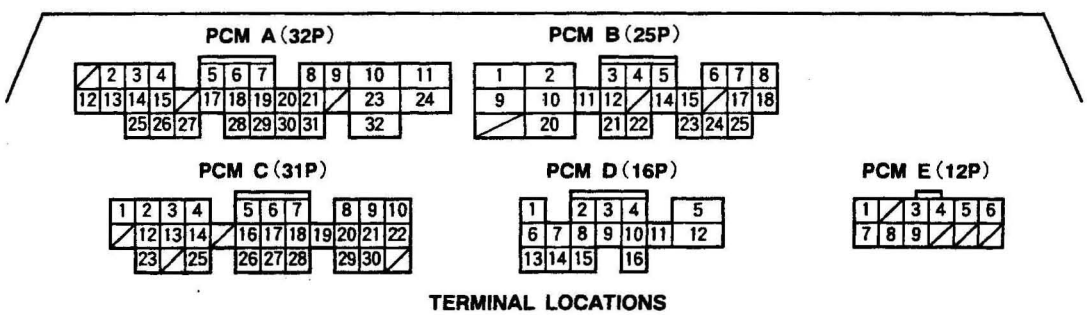
PCM Electrical Connections — '99 Model (cont'd)



BACK

Protected by AR





TERMINAL LOCATIONS

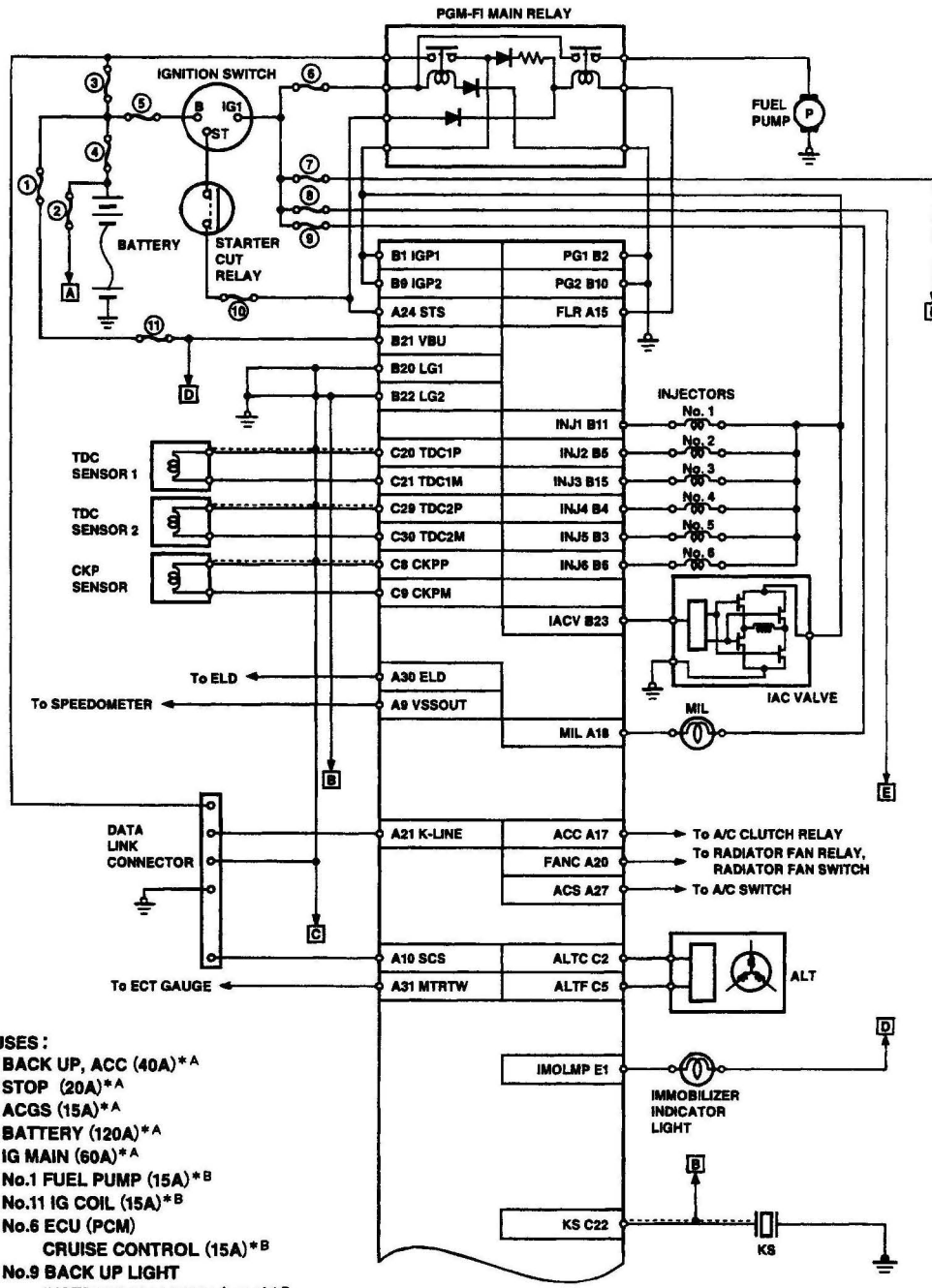
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Electrical Connections — '00-01 Models



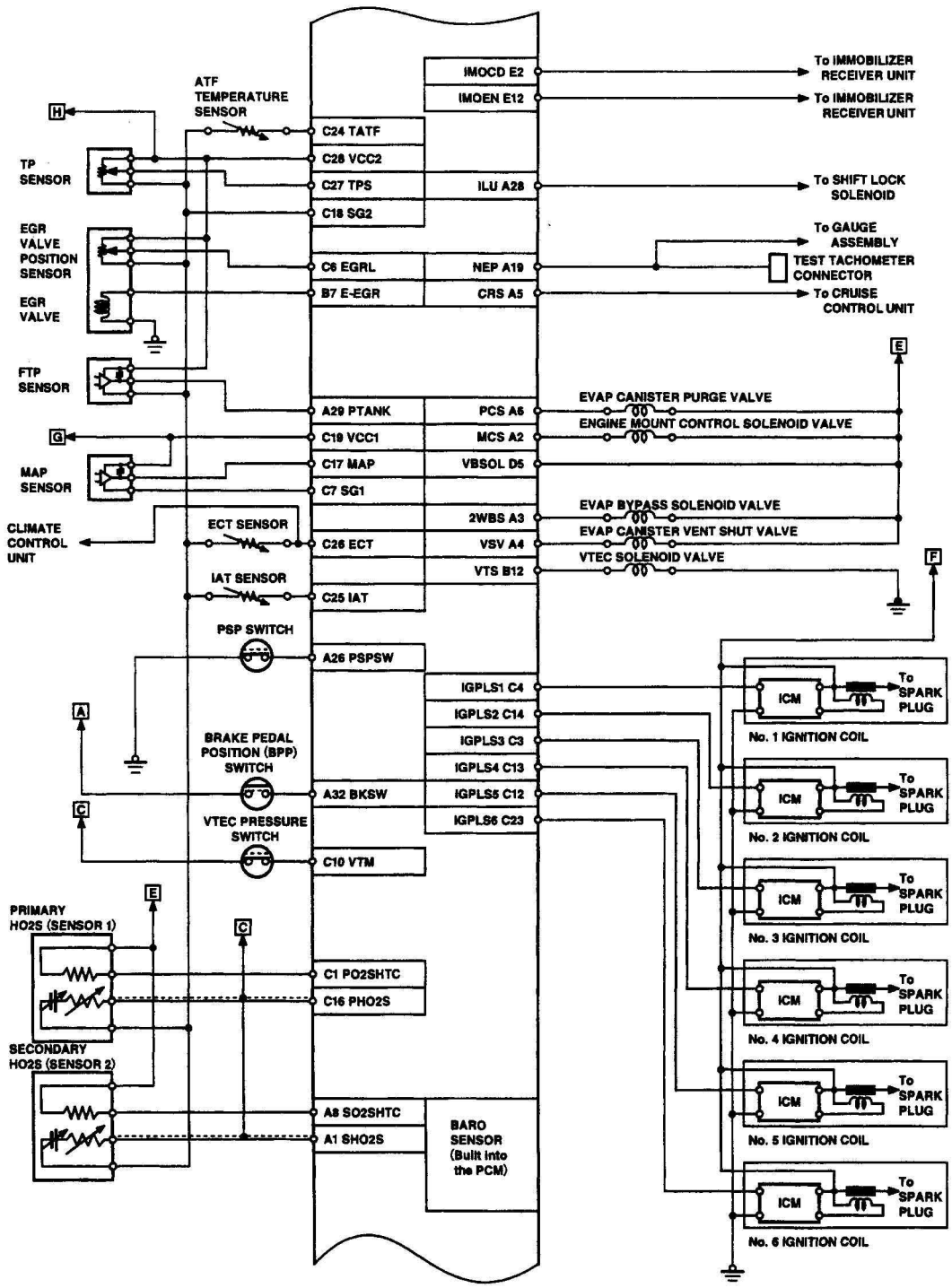
FUSES:

① BACK UP, ACC (40A)*A
② STOP (20A)*A
③ ACGS (15A)*A
④ BATTERY (120A)*A
⑤ IG MAIN (60A)*A
⑥ No.1 FUEL PUMP (15A)*B
⑦ No.11 IG COIL (15A)*B
⑧ No.6 ECU (PCM)
CRUISE CONTROL (15A)*B
⑨ No.9 BACK UP LIGHT
INSTRUMENT LIGHT (7.5A)*B
⑩ No.13 STARTER SIGNAL (7.5A)*B
⑪ No.13 CLOCK BACKUP (7.5A)*C

*A: In the under-hood fuse/relay box
*B: In the driver's under-dash fuse/relay box
*C: In the passenger's under-dash fuse/relay box

BACK

Protected by AR



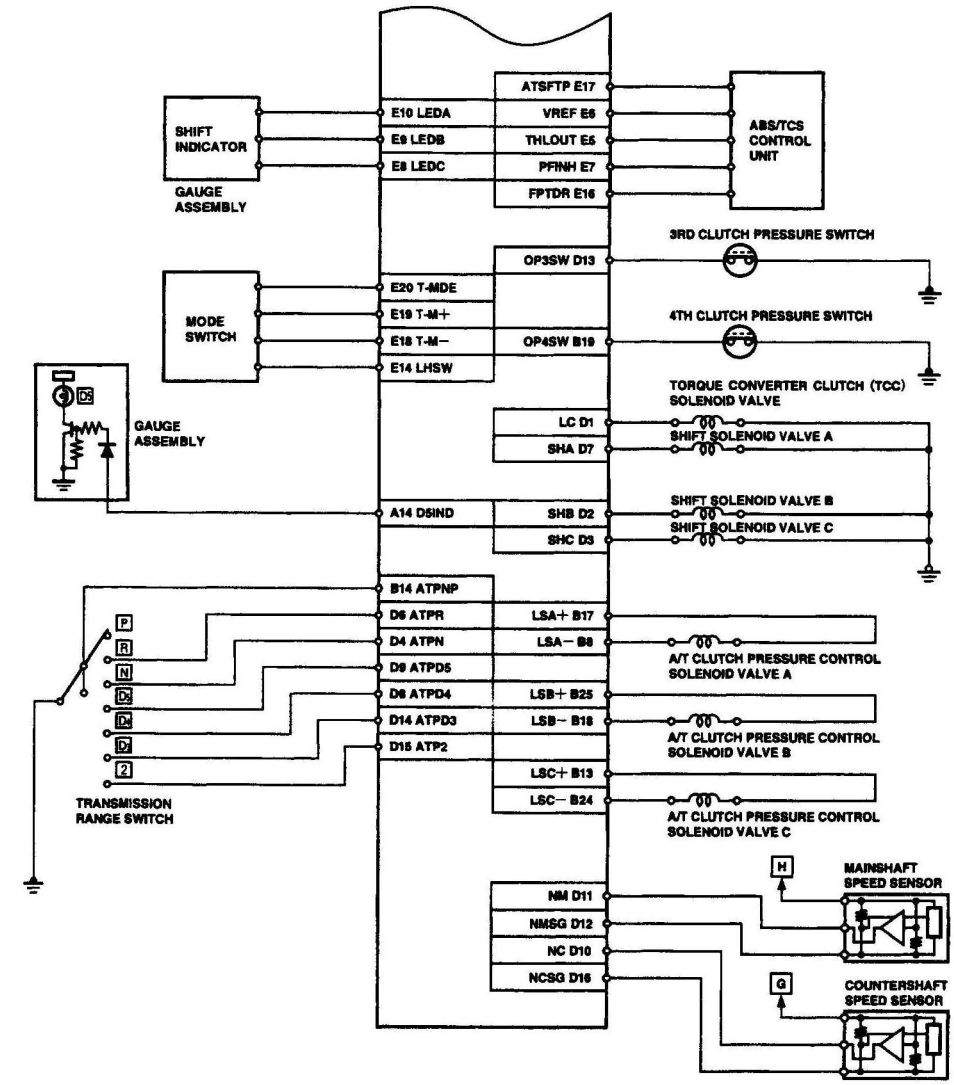
(cont'd)

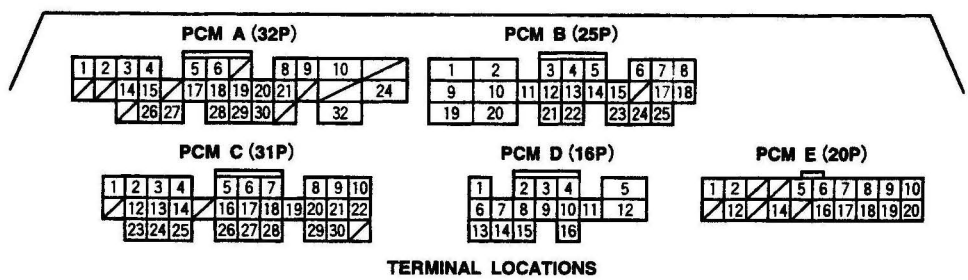
BACK

Protected by AR

System Descriptions (cont'd)

PCM Electrical Connections — '00-01 Models (cont'd)



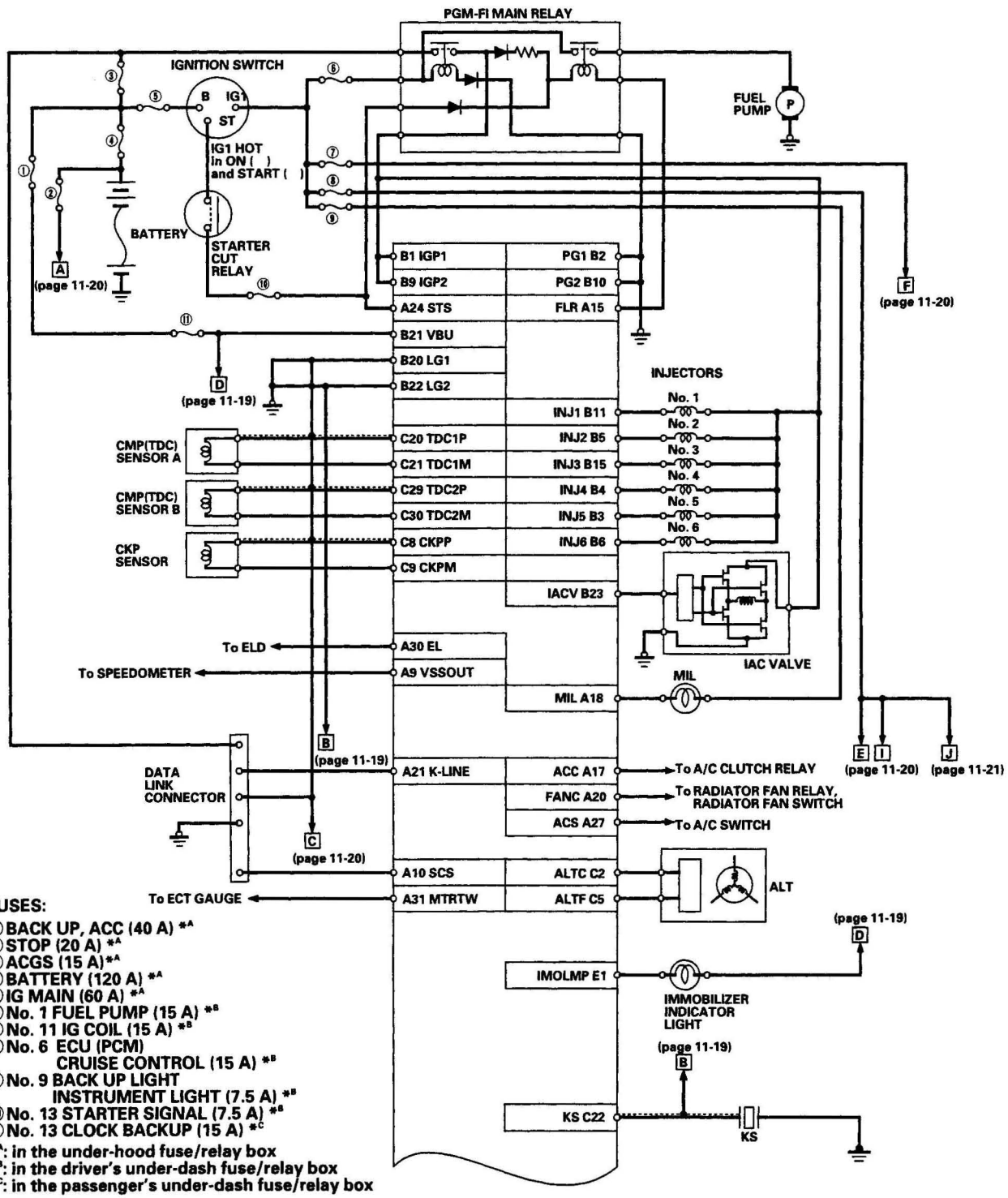


TERMINAL LOCATIONS

BACK

Protected by AR

PCM Electrical Connections — '02-03 Models (cont'd)



FUSES:

① BACK UP, ACC (40 A) *A
② STOP (20 A) *A
③ ACGS (15 A) *A
④ BATTERY (120 A) *A
⑤ IG MAIN (60 A) *A
⑥ No. 1 FUEL PUMP (15 A) *B
⑦ No. 11 IG COIL (15 A) *B
⑧ No. 6 ECU (PCM)
CRUISE CONTROL (15 A) *B
⑨ No. 9 BACK UP LIGHT
INSTRUMENT LIGHT (7.5 A) *B
⑩ No. 13 STARTER SIGNAL (7.5 A) *B
⑪ No. 13 CLOCK BACKUP (15 A) *C

*A: in the under-hood fuse/relay box
*B: in the driver's under-dash fuse/relay box
*C: in the passenger's under-dash fuse/relay box

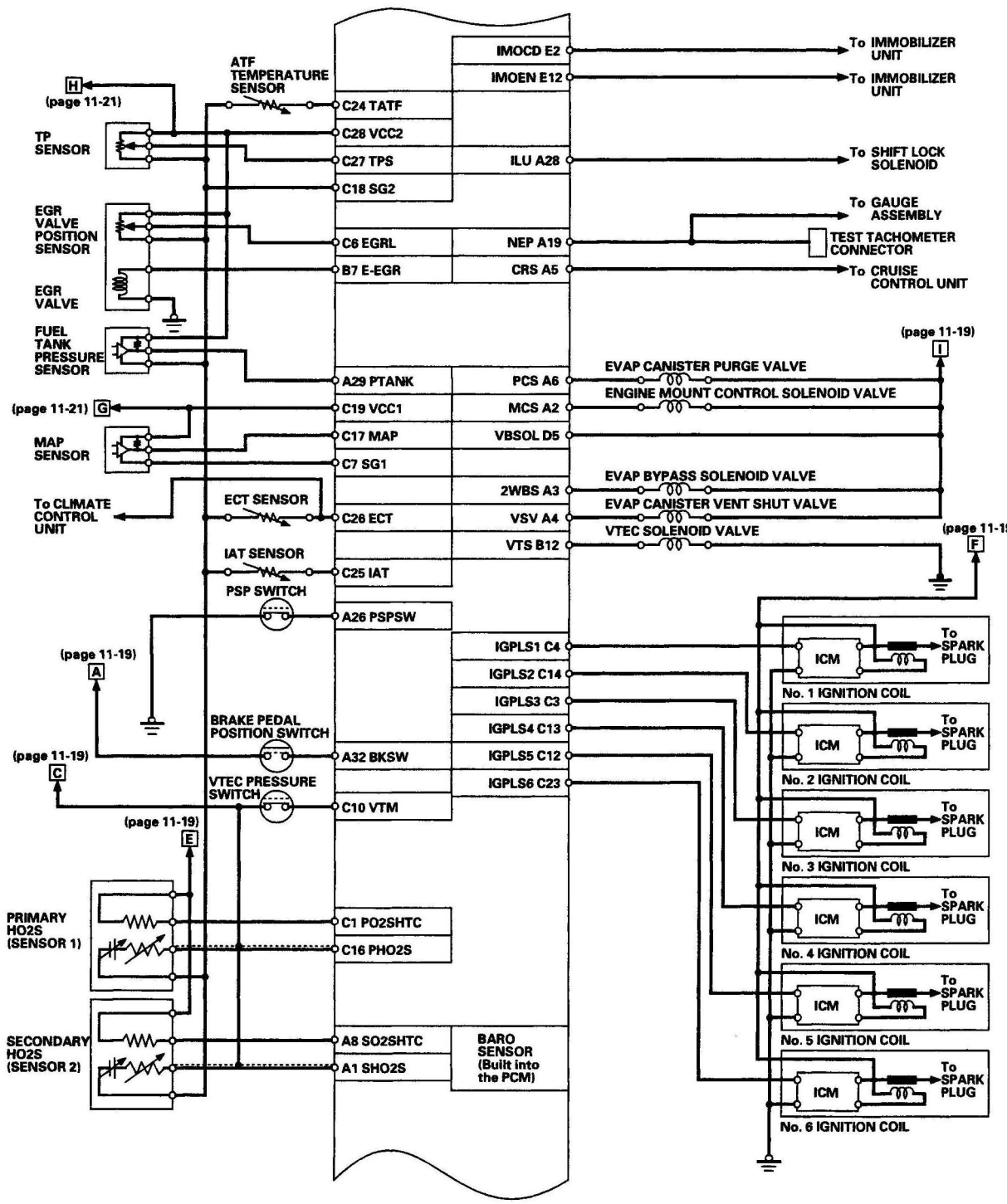
(cont'd)

BACK

Protected by AR

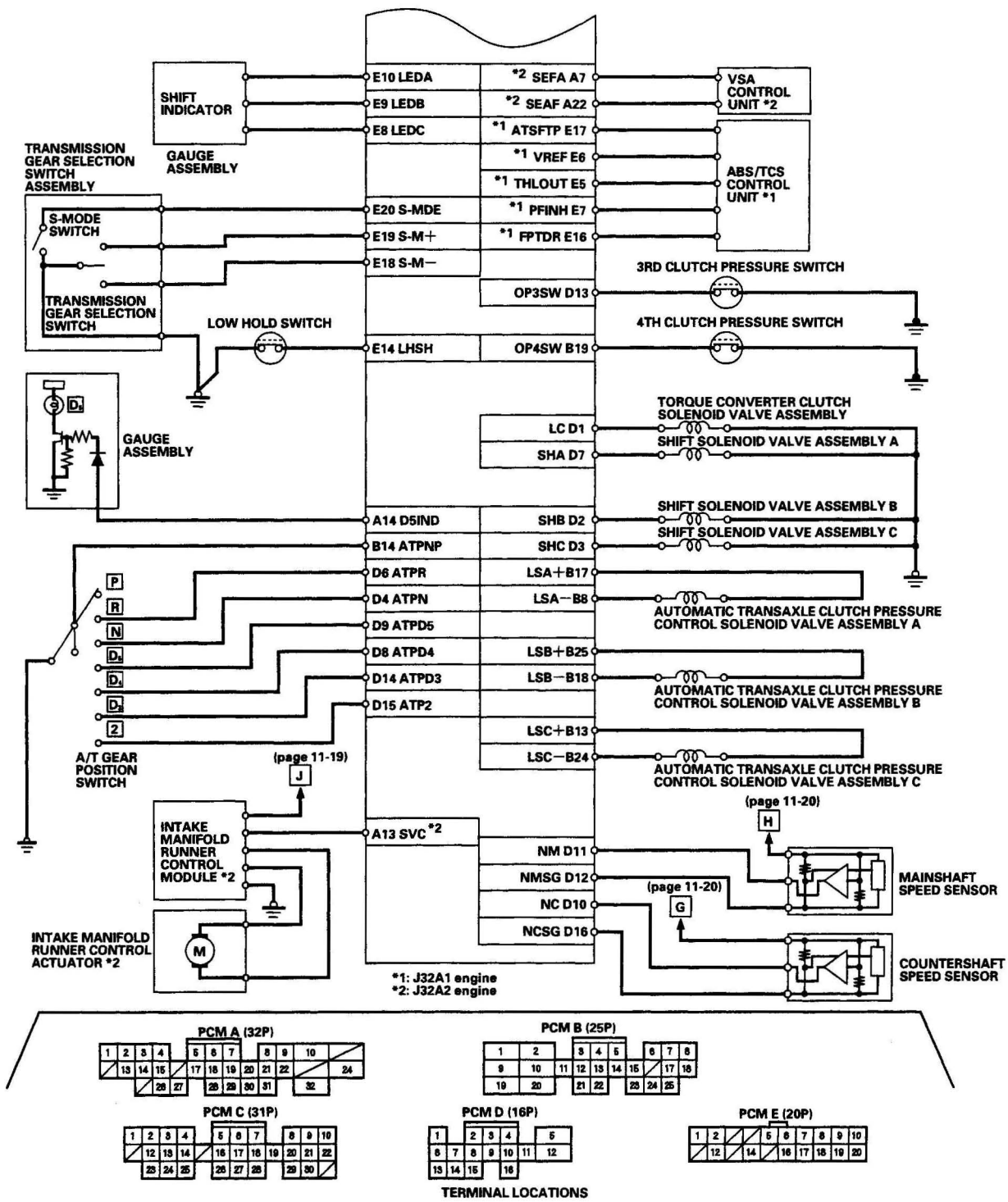
System Descriptions (cont'd)

PCM Electrical Connections — '02-03 Models (cont'd)



BACK

Protected by AR



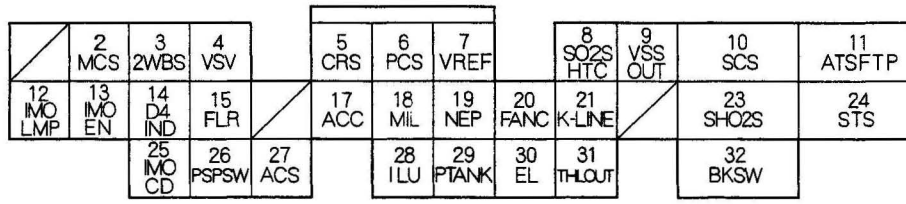
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector A (32P) — '99 Model



Wire side of female terminals

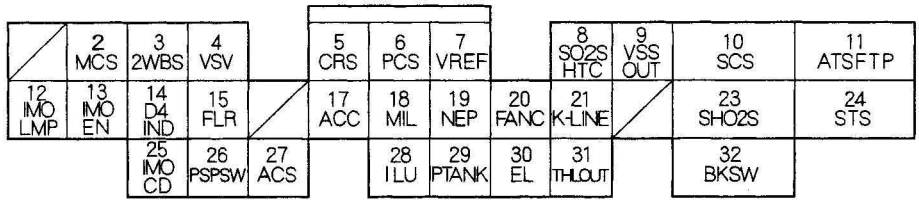
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
2	GRN/WHT	MCS (ENGINE MOUNT CONTROL SOLENOID VALVE)	Drives engine mount control solenoid valve.	At idle: about 0 V Above idle: battery voltage
3	BLU	2WBS (EVAP BYPASS SOLENOID VALVE)	Drives EVAP bypass solenoid valve.	With ignition switch ON (II): battery voltage
4	LT GRN/WHT	VSV (EVAP CONTROL CANISTER VENT SHUT VALVE)	Drives EVAP control canister vent shut valve.	With ignition switch ON (II): battery voltage
5	BLU/GRN	CRS (CRUISE CONTROL SIGNAL)	Detects cruise control signal.	With ignition switch ON (II): pulses
6	RED/YEL	PCS (EVAP PURGE CONTROL SOLENOID VALVE)	Drives EVAP purge control solenoid valve.	With engine running, engine coolant, below 147°F (64°C): battery voltage With engine running, engine coolant, above 147°F (64°C): duty controlled
7	ORN/WHT	VREF (REFERENCE VOLTAGE)	Provides reference voltage to ABS/TCS control unit.	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
8	BLK/WHT	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives secondary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
9	BLU/WHT	VSSOUT (VEHICLE SPEED SENSOR OUTPUT SIGNAL)	Sends vehicle speed sensor signal.	Depending on vehicle speed: pulses
10	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication)	With the service check signal shorted with the PGM Tester: about 0 V With the service check signal opened about 5 V or battery voltage
11	LT GRN	ATSFTP (A/T GEAR POSITION SWITCH OUTPUT SIGNAL)	Sends A/T gear position switch signal.	With engine running in park position: about 4 V
12	PNK	IMOLMP (IMMOBILIZER INDICATOR LIGHT)	Drives immobilizer indicator light.	With immobilizer indicator light turned ON: about 0 V With immobilizer indicator light turned OFF: battery voltage
13	BLU	IMOEN (IMMOBILIZER ENABLE SIGNAL)	Sends immobilizer enable signal.	
14	GRN/BLK	D4IND (D4 INDICATOR)	Drives D4 indicator light.	With D4 indicator light turned ON: about 7 V With D4 indicator light turned OFF: battery voltage
15	GRN/YEL	FLR (FUEL PUMP RELAY)	Drives fuel pump relay.	About 0 V for 2 seconds after turning ignition switch ON (II), then battery voltage
17	RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay.	With compressor ON: about 0 V With compressor OFF: battery voltage

BACK

Protected by AR

PCM Inputs and Outputs at Connector A (32P) — '99 Model



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
18	GRN/ORN	MIL (MALFUNCTION INDICATOR LIGHT)	Drives MIL.	With MIL turned ON: about 0 V With MIL turned OFF: battery voltage
19	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse.	With engine running: pulses
20	GRN	FANC (RADIATOR FAN CONTROL)	Drive radiator fan relay.	With radiator fan running: about 0 V With radiator fan stopped: battery voltage
21	GRY	K-LINE	Sends and receives scan tool signal.	With ignition switch ON (II): pulses
23	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR(SECONDARY HO2S), SENSOR 2)	Detects secondary heated oxygen sensor (sensor 2) signal.	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
24	BLU/ORN	STS (STARTER SWITCH SIGNAL)	Detects starter switch signal.	With starter switch ON (III): battery voltage With starter switch OFF: about 0 V
25	RED	IMOCD (IMMOBILIZER CODE)	Detects immobilizer signal.	
26	GRN	PSPSW (P/S PRESSURE SWITCH SIGNAL)	Detects PSP switch signal.	At idle with steering wheel in straight ahead position: about 0 V At idle with steering wheel at full lock: battery voltage
27	BLU/RED	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal.	With A/C switch ON: about 0 V With A/C switch OFF: about 5V
28	WHT/RED	ILU (INTERLOCK CONTROL UNIT)	Drives interlock control unit.	With ignition switch ON (II) and brake pedal pressed: battery voltage
29	LT GRN	PTANK (FUEL TANK PRESSURE SENSOR)	Detects fuel tank pressure sensor signal.	With ignition switch ON (II) and fuel fill cap opened: about 2.5 V
30	GRN/RED	EL (ELD)	Detects ELD signal.	With parking lights turned on at idle: about 2.5—3.5 V With low beam headlights turned on at idle: about 1.5—2.5 V
31	RED/BLU	THLOUT (THROTTLE POSITION SENSOR OUTPUT SIGNAL)	Sends TP sensor signal.	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
32	WHT/BLK	BKSW (BRAKE SWITCH)	Detects brake switch signal.	With brake pedal released: 0 V

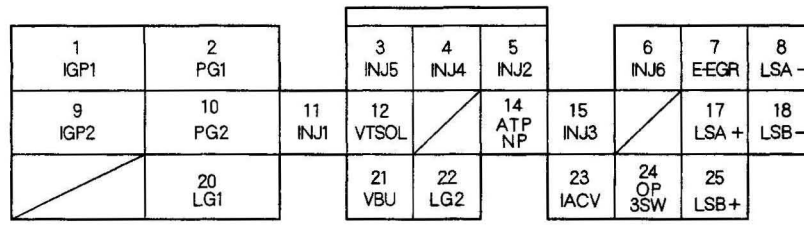
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector B (25P) – '99 Model



Wire side of female terminals

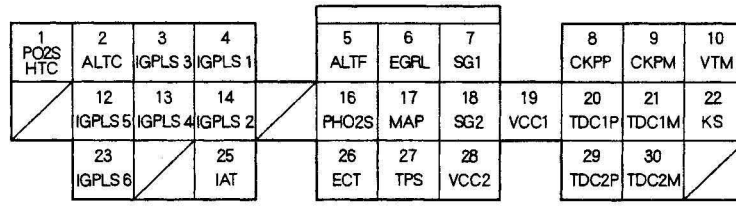
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: about 0 V
2	BLK	PG1 (POWER GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times
3	BLK/RED	INJ5 (No. 5 FUEL INJECTOR)	Drives No. 5 fuel injector.	With engine running: duty controlled
4	YEL	INJ4 (No. 4 FUEL INJECTOR)	Drives No. 4 fuel injector.	
5	RED	INJ2 (No. 2 FUEL INJECTOR)	Drives No. 2 fuel injector.	
6	WHT/BLU	INJ6 (No. 6 FUEL INJECTOR)	Drives No. 6 fuel injector.	
7	PNK	E-EGR	Drives EGR valve.	With EGR operation during driving with fully warmed up engine: duty controlled With EGR not operating: about 0 V
8	WHT	LSA-(A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A-SIDE)	A/T clutch pressure control solenoid valve A power supply negative terminal.	With ignition switch ON (II): duty controlled
9	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the PCM control circuit.	With the ignition switch ON (II): battery voltage With the ignition switch OFF: about 0 V
10	BLK	PG2 (POWER GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times
11	BRN	INJ1 (No.1 FUEL INJECTOR)	Drives No.1 fuel injector.	With engine running: duty controlled
12	GRN/YEL	VTSOL (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve.	With engine at low rpm: about 0 V With engine at high rpm: battery voltage
14	BLU/WHT	ATPNP (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In Park or neutral: about 0 V In any other position: battery voltlage
15	BLU	INJ3 (No. 3) FUEL INJECTOR	Drives No. 3 fuel injector.	With engine running: duty controlled
17	RED	LSA + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A + SIDE)	A/T clutch pressure control solenoid valve A power supply positive electrode	With the ignition switch ON (II): duty controlled
18	GRN	LSB - (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B – SIDE)	A/T clutch pressure control solenoid valve B power supply negative terminal	With ignition switch ON (II): duty controlled
20	BRN/BLK	LG1 (LOGIC GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times
21	WHT/YEL	VBU (VOLTAGE BACK UP)	Power source for the PCM control circuit. Power source for the DTC memory.	Battery voltage at this all times
22	BRN/BLK	LG2 (LOGIC GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times
23	BLK/BLU	IACV (IDLE AIR CONTROL VALVE)	Drives IAC valve.	With engine running: duty controlled
24	WHT/RED	OP3SW (3RD OIL PRESSURE SWITCH)	Detects 3rd oil pressure switch.	With the ignition switch ON (II): battery voltage
25	ORN	LSB + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B + SIDE)	A/T clutch pressure control solenoid valve B power supply positive terminal	With the ignition switch ON (II): duty controlled

BACK

Protected by AR

PCM Inputs and Outputs at connector C (31P) – '99 Model



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BLK/WHT	PO2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives primary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
2	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal.	With fully warmed-up engine running: about 8 V
3	BLU	IGPLS 3 (No. 3 IGNITION COIL PULSE)	Drives No. 3 ignition coil.	With ignition switch ON (II): 0 V With engine running: pulses
4	YEL/GRN	IGPLS 1 (No. 1 IGNITION COIL PULSE)	Drives No. 1 ignition coil.	
5	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal.	With fully warmed up engine running: about 0 V-battery voltage (depending on electrical load)
6	WHT/BLK	EGRL (EGR VALVE LIFT SENSOR)	Detects EGR valve lift sensor signal.	At idle: about 1.2 V
7	GRN/WHT	SG1 (SENSOR GROUND)	Ground for MAP sensor.	Less than 1.0 V at all times
8	BLU	CKPP (CKP SENSOR P SIDE)	Detects CKP sensor.	With engine running: pulses
9	WHT	CKPM (CKP SENSOR M SIDE)	Ground for CKP sensor.	
10	BLU/BLK	VTM (VTEC PRESSURE SWITCH SIGNAL)	Detects VTEC pressure switch signal.	With engine at low rpm: about 0 V With engine at high rpm: battery voltage
12	BLK/RED	IGPLS 5 (No. 5 IGNITION COIL PULSE)	Drives No. 5 ignition coil.	With ignition switch ON (II): 0 V With engine running: pulses
13	YEL	IGPLS 4 (No. 4 IGNITION COIL PULSE)	Drives No. 4 ignition coil.	
14	RED	IGPLS 2 (No. 2 IGNITION COIL PULSE)	Drives No. 2 ignition coil.	
16	WHT	PHO2S (PRIMARY HEATED OXYGEN SENSOR, SENSOR 1)	Detects primary heated oxygen sensor (sensor 1) sigal.	With throttle fully opened from idle with fully, warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
17	RED/GRN	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal.	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
18	GRN/BLK	SG2 (SENSOR GROUND)	Sensor ground.	Less than 1.0 V at all times.
19	YEL/RED	VCC1 (SENSOR VOLTAGE)	Power source to MAP sensor.	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
20	GRN	TDCP (TDC SENSOR P SIDE)	Detect TDC sensor 1.	With engine running: pulses
21	RED	TDCM (TDC SENSOR M SIDE)	Ground for TDC sensor 1.	
22	RED/BLU	KS (KNOCK SENSOR)	Detects KS signal.	With engine knocking: pulses
23	WHT/BLU	IGPLS 6 (No. 6 IGNITION COIL PULSE)	Drives No. 6 ignition coil.	With ignition switch ON (II): about 0 V With engine running: pulses
25	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal.	With ignition switch ON (II): about 0.1 – 4.8 V (depending on intake air temperature)
26	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal.	With ignition switch ON (II): about 0.1 – 4.8 V (depending on engine coolant temperature)
27	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal.	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
28	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage.	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
29	YEL	TDC2P (TDC2 SENSOR P SIDE)	Detects TDC sensor 2.	With engine running: pulses
30	BLK	TDC2M (TDC2 SENSOR M SIDE)	Ground for TDC sensor 2.	

(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector D (16P) – '99 Model

1 LC		2 SHB	3 SHC	4 ATPN		5 VBSOL
6 ATPR	7 SHA	8 ATPD3	9 ATPD4	10 NC	11 NM	12 NMSG
13 OP2SW	14 ATP2	15 ATP1		16 NCSG		

Wire side of female terminals

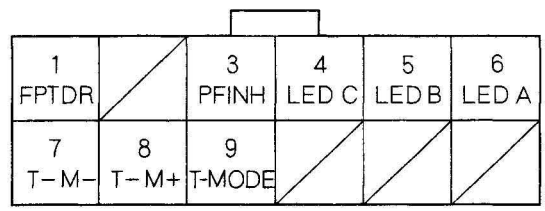
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL	LC (LOCK-UP CONTROL SOLENOID VALVE)	Drives look-up control solenoid valve.	With lock-up ON: battery voltage With lock-up OFF: about 0 V
2	GRN/WHT	SHB (SHIFT CONTROL SOLENOID VALVE B)	Drives shift control solenoid valve B.	With engine running in 1st, 2nd gears: battery voltage With engine running in 3rd, 4th gears: about 0 V
3	GRN	SHC (SHIFT CONTROL SOLENOID VALVE C)	Drives shift control solenoid valve C.	With engine running in 1st and 3rd gears: battery voltage With the engine running in 2nd and 4th gears: about 0 V
4	RED/BLK	ATPN (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In Neutral position: 0V In any other position: battery voltage
5	BLK/YEL	VBSOL (BATTERY VOLTAGE FOR SOLENOID VALVE)	Power source of solenoid valve.	With ignition switch ON (II): battery voltage
6	WHT	ATPR (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In R position: about 0 V In any other position: battery voltage
7	BLU/YEL	SHA (SHIFT CONTROL SOLENOID VALVE A)	Drives shift control solenoid valve A.	With engine running in 2nd, 3rd gears: battery voltage With engine running in 1st, 4th gears: about 0 V
8	PNK	ATPD3 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D3 position: about 0 V In any other position: battery voltage
9	YEL	ATPD4 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D4 position: about 0 V In any other position: about 5.0 V
10	BLU	NC (COUNTERSHAFT SPEED SENSOR)	Detects countershaft speed sensor signals.	With ignition switch ON (II), and front wheels rotating: pulses
11	RED	NM (MAINSHAFT SPEED SENSOR)	Detects mainshaft speed sensor signals.	With engine running: pulses
12	WHT	NMSG (MAINSHAFT SPEED SENSOR GROUND)	Ground for mainshaft speed sensor.	
13	BLU/BLK	OP2SW (2ND OIL PRESSURE SWITCH)	Detects 2nd oil pressure switch.	With ignition switch ON (II): battery voltage
14	BLU	ATP2 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In 2nd position: about 0 V In any other position: battery voltage
15	BRN	ATP1 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In 1st position: about 0 V In any other position: battery voltage
16	GRN	NCSG (COUNTERSHAFT SPEED SENSOR GROUND)	Ground for countershaft speed sensor.	

BACK

Protected by AR

PCM Inputs and Outputs at Connector E (12P) – '99 Model



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	PNK	FPTDR (FRAME TO POWERTRAIN TORQUE DOWN REQUEST)	Detects engine retard request signal.	With TCS operating: about 5 V With TCS not operating: about 2.5 V
3	BLU	PFINH (POWERTRAIN TO FRAME INHIBITION)	Sends TCS operation permission signal.	Permission (normal): about 2.5 V Inhibition (engine coolant temperature below 32°F (0°C)): about 5 V Failure (TCS and/or PCM is failure): about 0 V
4	BLU/BLK	LED C	Drives shift indicator.	In sequential sportshift mode: • in 1st and 3rd gear positions: battery voltage • in 2nd and 4th gear positions: about 0 V
5	BLU/GRN	LED B	Drives shift indicator.	In sequential sportshift mode: • in 2nd and 3rd gear positions: battery voltage • in 1st and 4th gear positions: about 0 V
6	BLU/RED	LED A	Drive shift indicator.	In sequential sportshift mode: • in 4th gear positions: battery voltage • in 1st, 2nd and 3rd gear positions: about 0 V
7	ORN	T–M–	Detects downshift switch signal.	In sequential sportshift mode and shift lever pushed toward downshift position (maked with "–"): about 0 V In sequential sportshift mode and shift lever in neutral position: battery voltage
8	YEL	T–M+	Detects upshift switch signal.	In sequential sportshift mode and shift lever pushed toward upshift position (maked with "+"): about 0 V In sequential sportshift mode and shift lever in neutral position: battry voltage
9	RED	T-MODE	Detects sequential sportshift mode switch signal.	In sequential sportshift mode (shift lever is positioned in sequential sportshift mode): about 0 V In other than sequential sportshift mode: battery voltage

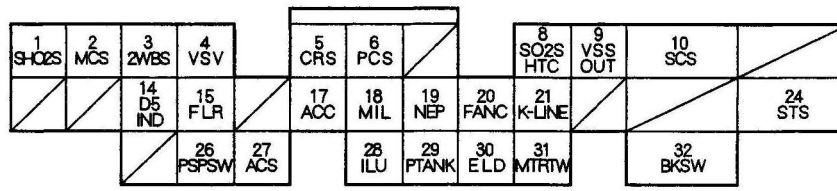
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector A (32P) – '00-01 Models



Wire side of female terminals

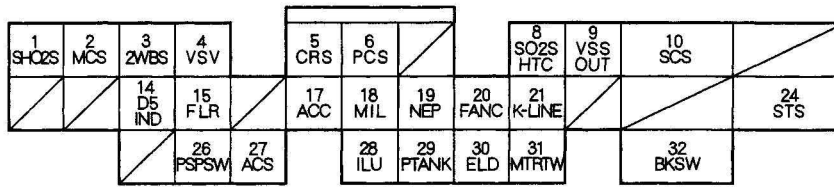
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR2)	Detected secondary heated oxygen sensor (sensor 2) signal.	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
2	GRN/WHT	MCS (ENGINE MOUNT CONTROL SOLENOID VALVE)	Drives engine mount control solenoid valve.	At idle: about 0 V Above idle: battery voltage
3	BLU	2WBS (EVAP BYPASS SOLENOID VALVE)	Drives EVAP bypass solenoid valve.	With ignition switch ON (II): battery voltage
4	LT GRN/WHT	VSV (EVAP CANISTER VENT SHUT VALVE)	Drives EVAP canister vent shut valve.	With ignition switch ON (II): battery voltage
5	BLU/GRN	CRS (CRUISE CONTROL SIGNAL)	Detects cruise control signal.	With ignition switch ON (II): pulses
6	RED/YEL	PCS (EVAP CANISTER PURGE VALVE)	Drives EVAP canister purge valve.	With engine running, engine coolant, below 147°F (64°C): battery voltage With engine running, engine coolant, above 147°F (64°C): duty controlled
8	BLK/WHT	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives secondary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
9	BLU/WHT	VSSOUT (VEHICLE SPEED SENSOR OUTPUT SIGNAL)	Sends vehicle speed sensor signal.	Depending on vehicle speed: pulses
10	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication)	With the service check signal shorted with the PGM Tester: about 0 V With the service check signal opened about 5 V or battery voltage
14	GRN/BLK	D5IND (D5 INDICATOR)	Drives D5 indicator light.	With D5 indicator light turned ON: about 7 V With D5 indicator light turned OFF: battery voltage
15	GRN/YEL	FLR (FUEL PUMP RELAY)	Drives fuel pump relay.	About 0 V for 2 seconds after turning ignition switch ON (II), then battery voltage
17	RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay.	With compressor ON: about 0 V With compressor OFF: battery voltage

BACK

Protected by AR

PCM Inputs and Outputs at Connector A (32P) – '00-01 Models



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
18	GRN/ORN	MIL (MALFUNCTION INDICATOR LIGHT)	Drives MIL.	With MIL turned ON: about 0 V With MIL turned OFF: battery voltage
19	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse.	With engine running: pulses
20	GRN	FANC (RADIATOR FAN CONTROL)	Drives radiator fan relay.	With radiator fan running: about 0 V With radiator fan stopped: battery voltage
21	GRY	K-LINE	Sends and receives scan tool signal.	With ignition switch ON (II): pulses
24	BLU/ORN	STS (STARTER SWITCH SIGNAL)	Detects starter switch signal.	With starter switch ON (III): battery voltage With starter switch OFF: about 0 V
26	GRN	PSPSW (P/S PRESSURE SWITCH SIGNAL)	Detects PSP switch signal.	At idle with steering wheel in straight ahead position: about 0 V At idle with steering wheel at full lock: battery voltage
27	BLU/RED	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal.	With A/C switch ON: about 0 V With A/C switch OFF: about 5V
28	WHT/RED	ILU (INTERLOCK CONTROL UNIT)	Sends interlock control signal.	With ignition switch ON (II) and brake pedal pressed: about 0 V
29	LT GRN	PTANK (FTP SENSOR)	Detects FTP sensor signal.	With ignition switch ON (II) and fuel fill cap opened: about 2.5 V
30	GRN/RED	ELD (ELECTRICAL LOAD DETECTOR)	Detects ELD signal.	With parking lights turned on at idle: about 2.5–3.5 V With low beam headlights turned on at idle: about 1.5–2.5 V
31	YEL/GRN	MTRTW	Sends ECT signal to ECT gauge.	With ignition switch on (II): duty controlled
32	WHT/BLK	BKSW (BRAKE PEDAL POSITION SWITCH)	Detects brake pedal position switch signal.	With brake pedal released: about 0 V With brake pedal pressed: battery voltage

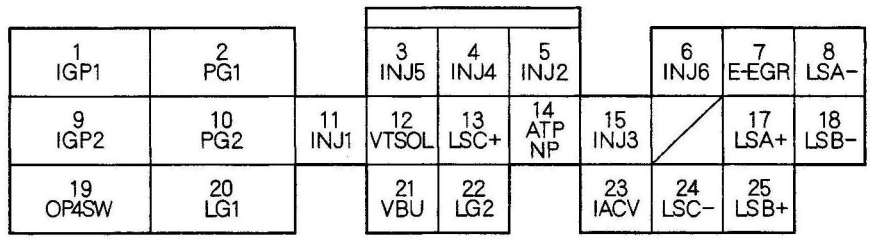
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector B (25P) – '00-01 Models



Wire side of female terminals

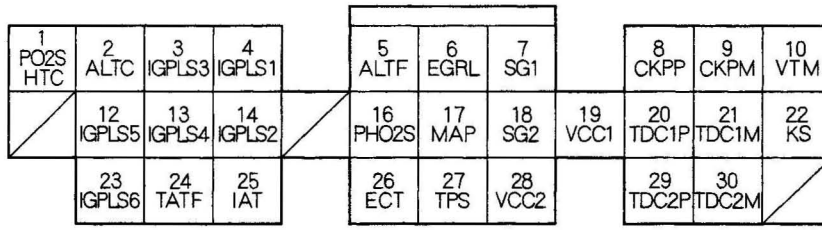
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: about 0 V
2	BLK	PG1 (POWER GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times
3	BLK/RED	INJ5 (No. 5 INJECTOR)	Drives No. 5 injector.	With engine running: duty controlled
4	YEL	INJ4 (No. 4 INJECTOR)	Drives No. 4 injector.	
5	RED	INJ2 (No. 2 INJECTOR)	Drives No. 2 injector.	
6	WHT/BLU	INJ6 (No. 6 INJECTOR)	Drives No. 6 injector.	
7	BLU/RED	E-EGR	Drives EGR valve.	With EGR operation during driving with fully warmed up engine: duty controlled With EGR not operating: 0 V
8	WHT	LSA – (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A – SIDE)	A/T clutch pressure control solenoid valve A power supply negative terminal.	With ignition switch ON (II): duty controlled
9	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the PCM control circuit.	With the ignition switch ON (II): battery voltage With the ignition switch OFF: about 0 V
10	BLK	PG2 (POWER GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times
11	BRN	INJ1 (No.1 INJECTOR)	Drives No.1 injector.	With engine running: duty controlled
12	GRN/YEL	VTSOL (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve.	With engine at low rpm: about 0 V With engine at high rpm: battery voltage
13	GRN/RED	LSC + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C + SIDE)	A/T clutch pressure control solenoid valve C power supply positive electrode	With ignition switch ON (II): duty controlled
14	BLU/WHT	ATPNP (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal.	In Park or neutral: about 0 V In any other position: battery voltage
15	BLU	INJ3 (No. 3) INJECTOR	Drives No. 3 injector.	With engine running: duty controlled
17	RED	LSA + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A + SIDE)	A/T clutch pressure control solenoid valve A power supply positive electrode	With the ignition switch ON (II): duty controlled
18	GRN	LSB – (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B – SIDE)	A/T clutch pressure control solenoid valve B power supply negative terminal	With ignition switch ON (II): duty controlled
19	BLU/YEL	OP4SW (4TH OIL PRESSURE SWITCH)	Detects 4th oil pressure switch.	With ignition switch ON (II): battery voltage
20	BRN/YEL	LG1 (LOGIC GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times
21	WHT/RED	VBU (VOLTAGE BACK UP)	Power source for the PCM control circuit. Power source for the DTC memory.	Battery voltage at all times
22	BRN/YEL	LG2 (LOGIC GROUND)	Ground for the PCM control circuit.	Less than 1.0 V at all times
23	BLK/RED	IACV (IDLE AIR CONTROL VALVE)	Drives IAC valve.	With engine running: duty controlled
24	RED/BLU	LSC – (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C – SIDE)	A/T clutch pressure control solenoid valve C power supply negative terminal	With ignition switch ON (II): duty controlled
25	BRN/BLU	LSB + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B + SIDE)	A/T clutch pressure control solenoid valve B power supply positive terminal	With the ignition switch ON (II): duty controlled

BACK

Protected by AR

PCM Inputs and Outputs at connector C (31P) – '00-01 Models



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BLK/WHT	PO2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives primary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
2	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal.	With fully warmed-up engine running: approx. 8 V
3	WHT/BLU	IGPLS 3 (No. 3 IGNITION COIL PULSE)	Drives No. 3 ignition coil.	With ignition switch ON (II): 0 V With engine running: pulses
4	YEL/GRN	IGPLS 1 (No. 1 IGNITION COIL PULSE)	Drives No. 1 ignition coil.	
5	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal.	With fully warmed up engine running: 0 V-battery voltage (depending on electrical load)
6	WHT/BLK	EGRL (EGR VALVE POSITION SENSOR)	Detects EGR valve position sensor signal.	At idle: about 1.2 V
7	GRN/WHT	SG1 (SENSOR GROUND)	Ground for MAP sensor.	Less than 1.0 V at all times
8	BLU	CKPP (CKP SENSOR P SIDE)	Detects CKP sensor.	With engine running: pulses
9	WHT	CKPM (CKP SENSOR M SIDE)	Ground for CKP sensor.	
10	BLU/BLK	VTM (VTEC OIL PRESSURE SWITCH SIGNAL)	Detects VTEC oil pressure switch signal.	With engine at low rpm: about 0 V With engine at high rpm: battery voltage
12	BLK/RED	IGPLS 5 (No. 5 IGNITION COIL PULSE)	Drives No. 5 ignition coil.	With ignition switch ON (II): 0 V With engine running: pulses
13	BRN	IGPLS 4 (No. 4 IGNITION COIL PULSE)	Drives No. 4 ignition coil.	
14	BLU/RED	IGPLS 2 (No. 2 IGNITION COIL PULSE)	Drives No. 2 ignition coil.	
16	WHT	PHO2S (PRIMARY HEATED OXYGEN SENSOR, SENSOR 1)	Detects primary heated oxygen sensor (sensor 1) sigal.	With throttle fully opened from idle with fully, warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
17	GRN/RED	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal.	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
18	GRN/YEL	SG2 (SENSOR GROUND)	Sensor ground.	Less than 1.0 V at all times.
19	YEL/RED	VCC1 (SENSOR VOLTAGE)	Provides sensor voltage.	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
20	GRN	TDC1P (TDC SENSOR 1P SIDE)	Detect TDC sensor 1.	With engine running: pulses
21	RED	TDC1M (TDC SENSOR 1M SIDE)	Ground for TDC sensor 1.	
22	RED/BLU	KS (KNOCK SENSOR)	Detects knock sensor signal.	With engine knocking: pulses
23	BLU/WHT	IGPLS 6 (No. 6 IGNITION COIL PULSE)	Drives No. 6 ignition coil.	With ignition switch ON (II): 0 V With engine running: pulses
24	BLU/YEL	TATF (ATF TEMPERATURE SENSOR)	Detects ATF temperature sensor signal.	With ignition switch ON (II): about 0.1 – 4.2 V (depending on ATF temperature)
25	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal.	With ignition switch ON (II): about 0.1 – 4.8 V (depending on intake air temperature)
26	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal.	With ignition switch ON (II): about 0.1 – 4.8 V (depending on engine coolant temperature)
27	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal.	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
28	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage.	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
29	YEL	TDC2P (TDC SENSOR 2P SIDE)	Detects TDC sensor 2.	With engine running: pulses
30	BLK	TDC2M (TDC SENSOR 2M SIDE)	Ground for TDC sensor 2.	

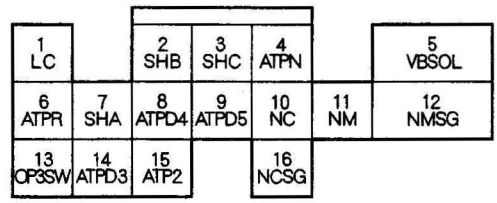
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector D (16P) – '00-01 Models



Wire side of female terminals

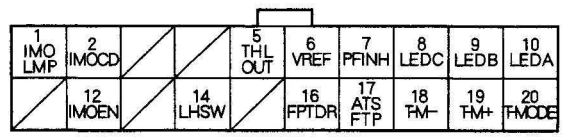
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL	LC (TORQUE CONVERTER CLUTCH SOLENOID VALVE ASSEMBLY)	Drives torque converter clutch solenoid valve assembly	With lock-up ON: battery voltage With lock-up OFF: about 0 V
2	GRN/WHT	SHB (SHIFT SOLENOID VALVE B)	Drives shift solenoid valve B.	With engine running in 1st, 2nd gears: battery voltage With engine running in 3rd, 4th gears: about 0 V
3	GRN	SHC (SHIFT SOLENOID VALVE C)	Drives shift solenoid valve C.	With engine running in 1st and 3rd gears: battery voltage With the engine running in 2nd and 4th gears: about 0 V
4	RED/BLK	ATPN (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal.	In Neutral position: 0 V In any other position: battery voltage
5	BLK/YEL	VBSOL (BATTERY VOLTAGE FOR SOLENOID VALVE)	Power source of solenoid valve.	With ignition switch ON (II): battery voltage
6	WHT	ATPR (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal.	In R position: about 0 V In any other position: battery voltage
7	BLU/YEL	SHA (SHIFT SOLENOID VALVE A)	Drives shift solenoid valve A.	With engine running in 2nd, 3rd gears: battery voltage With engine running in 1st, 4th gears: about 0 V
8	YEL	ATPD4 (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal.	In D4 position: about 0 V In any other position: battery voltage
9	YEL/GRN	ATPD5 (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal.	In D5 position: about 0 V In any other position: approx. 5.0 V
10	BLU	NC (COUNTERSHAFT SPEED SENSOR)	Detects countershaft speed sensor signals.	With ignition switch ON (II), and front wheels rotating: pulses
11	RED	NM (MAINSHAFT SPEED SENSOR)	Detects mainshaft speed sensor signals.	With engine running: pulses
12	WHT	NMSG (MAINSHAFT SPEED SENSOR GROUND)	Ground for mainshaft speed sensor.	
13	BLU/WHT	OP3SW (3RD OIL PRESSURE SWITCH)	Detects 3rd oil pressure switch.	With ignition switch ON (II): battery voltage
14	RED	ATPD3 (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal.	In D3 position: about 0 V In any other position: battery voltage
15	BLU	ATP2 (TRANSMISSION RANGE SWITCH)	Detects transmission range switch signal.	In 2nd position: about 0 V In any other position: battery voltage
16	GRN	NCSG (COUNTERSHAFT SPEED SENSOR GROUND)	Ground for countershaft speed sensor.	

BACK

Protected by AR

PCM Inputs and Outputs at Connector E (20P) – '00-01 Models



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	PNK	IMOLMP (IMMOBILIZER INDICATOR LIGHT)	Drives immobilizer indicator light.	With immobilizer indicator light turned ON: about 0 V With immobilizer indicator light turned OFF: battery voltage.
2	RED	IMOCD (IMMOBILIZER CODE)	Detects immobilizer signal.	
5	RED/BLU	THLOUT (THROTTLE POSITION SENSOR OUTPUT SIGNAL)	Sends TP sensor signal.	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
6	ORN/WHT	VREF (REFERENCE VOLTAGE)	Provides reference voltage to ABS/TCS control unit.	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
7	BLU	PFINH (POWERTRAIN TO FRAME INHIBITION)	Sends TCS operation permission signal.	Permission (normal): about 2.5 V Inhibition (engine coolant temperature below 32°F (0°C): about 5 V Failure (TCS and/or PCM is failure): about 0 V
8	BLU/BLK	LED C	Drives shift indicator.	In sequential sportshift mode: • in 1st and 3rd gear positions: battery voltage • in 2nd and 4th gear position: about 0 V
9	BLU/GRN	LED B	Drives shift indicator.	In sequential sportshift mode: • in 1st and 3rd gear positions: battery voltage • in 2nd and 4th gear position: about 0 V
10	BLU/RED	LED A	Drives shift indicator.	In sequential sportshift mode: • in 4th gear positions: battery voltage • in 1st, 2nd and 3rd gear position: about 0 V
12	BLU	IMOEN (IMMOBILIZER ENABLE SIGNAL)	Sends immobilizer enable signal	
14	BRN	LHSW (1ST HOLD SWITCH)	Detects 1st switch signal.	With LH switch ON: about 0 V With LH switch OFF: battery voltage
16	PNK	FPTDR (FRAME TO POWERTRAIN TORQUE DOWN REQUEST)	Detects engine retard request signal.	With TCS operating : about 5 V With TCS not operating: about 2.5 V
17	LT GRN	ATSFTP (TRANSMISSION RANGE SWITCH OUTPUT SIGNAL)	Sends transmission range switch signal.	With engine running in park position: about 4 V
18	ORN	T–M–	Detects downshift switch signal.	In sequential sportshift mode and shift lever pushed toward downshift position (maked with "–"): about 0 V In sequential sportshift mode and shift lever in neutral position: battery voltage
19	YEL	T–M+	Detects upshift switch signal.	In sequential sportshift mode and shift lever pushed toward upshift position (maked with "+"): about 0 V In sequential sportshift mode and shift lever in neutral position: battery voltage
20	RED	T–MODE	Detects sequential sportshift mode switch signal.	In sequental sportshift mode (shift lever is positioned in sequential sportshift mode): about 0 V In other than sequential sportshift mode: battery voltage

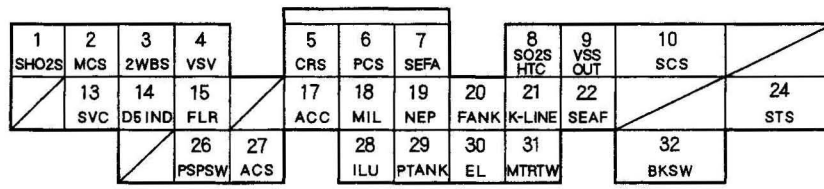
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector A (32P) – '02-03 Models



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

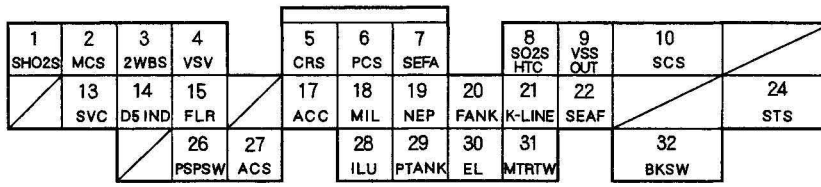
Terminal number	Wire color	Terminal name	Description	Signal
1	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR2)	Detected secondary heated oxygen sensor (sensor 2) signal	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
2	GRN/WHT	MCS (ENGINE MOUNT CONTROL SOLENOID VALVE)	Drives engine mount control solenoid valve	At idle: 0 V Above idle: battery voltage
3	BLU	2WBS (EVAP BYPASS SOLENOID VALVE)	Drives EVAP bypass solenoid valve	With ignition switch ON (II): battery voltage
4	LT GRN/WHT	VSV (EVAP CANISTER VENT SHUT VALVE)	Drives EVAP control canister vent shut valve	With ignition switch ON (II): battery voltage
5	BLU/GRN	CRS (CRUISE CONTROL SIGNAL)	Detects cruise control signal	With ignition switch ON (II): pulses
6	RED/YEL	PCS (EVAP CANISTER PURGE VALVE)	Drives EVAP purge control solenoid valve	With engine running, engine coolant, below 147°F (64°C): battery voltage With engine running, engine coolant, above 147°F (64°C): duty controlled
7*	PNK	SEFA (SERIAL DATALINE)	Comunicates with the VSA control unit	With ignition with ON (II): pulses
8	BLK/WHT	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives secondary heated oxygen sensor heater	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
9	BLU/WHT	VSSOUT (VEHICLE SPEED SENSOR OUTPUT SIGNAL)	Sends vehicle speed sensor signal	Depending on vehicle speed: pulses
10	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication)	With the service check signal shorted with the PGM Tester: 0 V With the service check signal opened about 5 V or battery voltage
13*	LT BLU	SVC (INTAKE MANIFOLD RUNNER CONTROL)	Sends driving signal to Intake Manifold Runner control unit	With engine speed above 3,600 rpm: 0 V With engine speed. below 3,400 rpm: about 5 V
14	GRN/BLK	D5IND (D5 INDICATOR)	Drives D5 indicator light	With D5 indicator light turned ON: approx. 7 V With D5 indicator light turned OFF: 0 V
15	GRN/YEL	FLR (FUEL PUMP RELAY)	Drives fuel pump relay	0 V for two seconds after turning ignition switch ON (II), then battery voltage
17	RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay	With compressor ON: 0 V With compressor OFF: battery voltage

*: J32A2 engine

BACK

Protected by AR

PCM Inputs and Outputs at Connector A (32P) – '02-03 Models



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
18	GRN/ORN	MIL (MALFUNCTION INDICATOR LIGHT)	Drives MIL	With MIL turned ON: 0 V With MIL turned OFF: battery voltage
19	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse	With engine running: pulses
20	GRN	FANC (RADIATOR FAN CONTROL)	Drives radiator fan relay	With radiator fan running: 0 V With radiator fan stopped: battery voltage
21	GRY	K-LINE	Sends and receives scan tool signal	
22*	RED/GRN	SEAF (SERIAL DATA LINE)	Comunicates with the VSA control unit	With ignition switch ON (II): pulses
24	BLU/ORN	STS (STARTER SWITCH SIGNAL)	Detects starter switch signal	With starter switch ON (III): battery voltage With starter switch OFF: 0 V
26	GRN	PSPSW (P/S PRESSURE SWITCH SIGNAL)	Detects PSP switch signal	At idle with steering wheel in straight ahead position: 0 V At idle with steering wheel at full lock: battery voltage
27	BLU/RED	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal	With A/C switch ON: 0 V With A/C switch OFF: about 5 V
28	WHT/RED	ILU (INTERLOCK CONTROL UNIT)	Drives interlock control unit	With ignition switch ON (II) and brake pedal depressed: 0 V; brake pedal released: battery voltage
29	LT GRN	PTANK (FUEL TANK PRESSURE SENSOR)	Detects fuel tank pressure sensor signal	With ignition switch ON (II) and fuel fill cap opened: about 2.5 V
30	GRN/RED	EL (ELD)	Detects ELD signal	With parking lights turned on at idle: about 2.5–3.5 V With high beam headlights turned on at idle: about 1.5–2.5 V
31	YEL/GRN	MTRTW	Sends ECT signal to ECT gauge	With ignition switch on (II): duty controlled
32	WHT/BLK	BKSW (BRAKE PEDAL POSITION SWITCH)	Detects brake switch signal	With brake pedal released: 0 V

*: J32A2 engine

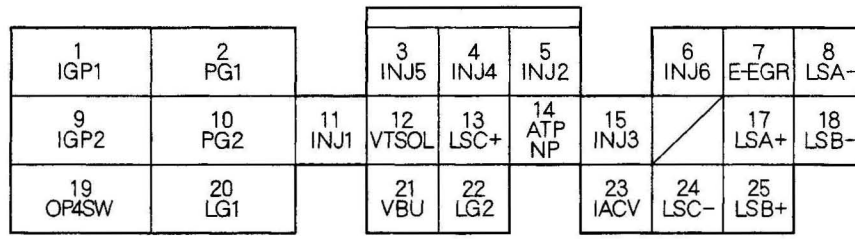
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector B (25P) – '02-03 Models



Wire side of female terminals

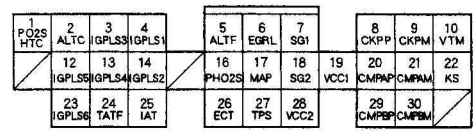
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the PCM control circuit	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
2	BLK	PG1 (POWER GROUND)	Ground for the PCM control circuit	Less than 1.0 V at all times
3	BLK/RED	INJ5 (No. 5 INJECTOR)	Drives No. 5 injector	With engine running: duty controlled
4	YEL	INJ4 (No. 4 INJECTOR)	Drives No. 4 injector	
5	RED	INJ2 (No. 2 INJECTOR)	Drives No. 2 injector	
6	WHT/BLU	INJ6 (No. 6 INJECTOR)	Drives No. 6 injector	
7	BLU/RED	E-EGR	Drives EGR valve	With EGR operation during driving with fully warmed up engine: duty controlled With EGR not operating: 0 V
8	WHT	LSA-(A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A-SIDE)	A/T clutch pressure control solenoid valve A power supply negative terminal	With ignition switch ON (II): duty controlled
9	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the PCM control circuit	With the ignition switch ON (II): battery voltage With the ignition switch OFF: 0 V
10	BLK	PG2 (POWER GROUND)	Ground for the PCM control circuit	Less than 1.0 V at all times
11	BRN	INJ1 (No.1 FUEL INJECTOR)	Drives No.1 fuel injector	With engine running: duty controlled
12	GRN/YEL	VTSOL (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve	With engine at low rpm: 0 V With engine at high rpm: battery voltage
13	GRN/RED	LS C + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C + SIDE)	A/T clutch pressure control solenoid valve C power supply positive electrode	With ignition switch ON (II): duty controlled
14	BLU/WHT	ATPNP (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal	In Park or neutral: 0 V In any other position: 5 V
15	BLU	INJ3 (No. 3) INJECTOR	Drives No. 3 fuel injector	With engine running: duty controlled
17	RED	LSA + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A + SIDE)	A/T clutch pressure control solenoid valve A power supply positive electrode	With the ignition switch ON (II): duty controlled
18	GRN	LSB - (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B – SIDE)	A/T clutch pressure control solenoid valve B power supply negative terminal	With ignition switch ON (II): duty controlled
19	BLU/YEL	OP4SW (4TH OIL PRESSURE SWITCH)	Detects 4th oil pressure switch	With ignition switch ON (II): battery voltage
20	BRN/YEL	LG1 (LOGIC GROUND)	Ground for the PCM control circuit	Less than 1.0 V at all times
21	WHT/RED	VBU (VOLTAGE BACK UP)	Power source for the PCM control circuit Power source for the DTC memory	Battery voltage at all times
22	BRN/YEL	LG2 (LOGIC GROUND)	Ground for the PCM control circuit	Less than 1.0 V at all times
23	BLK/RED	IACV (IDLE AIR CONTROL VALVE)	Drives IAC valve	With engine running: duty controlled
24	RED/BLU	LS C (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C-SIDE)	A/T clutch pressure control solenoid valve C power supply negative terminal	With ignition switch ON (II): duty controlled
25	BRN/WHT	LSB + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B + SIDE)	A/T clutch pressure control solenoid valve B power supply positive terminal	With the ignition switch ON (II): duty controlled

BACK

Protected by AR

PCM Inputs and Outputs at Connector C (31P) – '02-03 Models



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BLK/WHT	PO2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives primary heated oxygen sensor heater	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
2	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal	With fully warmed-up engine running: approx. 8 V
3	WHT/BLU	IGPLS 3 (No. 3 IGNITION COIL PULSE)	Drives No. 3 ignition coil	With ignition switch ON (II): 0 V With engine running: pulses
4	YEL/GRN	IGPLS 1 (No. 1 IGNITION COIL PULSE)	Drives No. 1 ignition coil	
5	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal	With fully warmed up engine running: 0 V-battery voltage (depending on electrical load)
6	WHT/BLK	EGRL (EGR VALVE LIFT SENSOR)	Detects EGR valve lift sensor signal	At idle: about 1.2 V
7	GRN/WHT	SG1 (SENSOR GROUND)	Ground for MAP sensor	Less than 1.0 V at all times
8	BLU	CKPP (CKP SENSOR P SIDE)	Detects CKP sensor	With engine running: pulses
9	WHT	CKPM (CKP SENSOR M SIDE)	Ground for CKP sensor	
10	BLU/BLK	VTM (VTEC OIL PRESSURE SWITCH SIGNAL)	Detects VTEC pressure switch signal	With engine at low rpm: 0 V With engine at high rpm: battery voltage
12	BLK/RED	IGPLS 5 (No. 5 IGNITION COIL PULSE)	Drives No. 5 ignition coil	With ignition switch ON (II): 0V With engine running: pulses
13	BRN	IGPLS 4 (No. 4 IGNITION COIL PULSE)	Drives No. 4 ignition coil	
14	BLU/RED	IGPLS 2 (No. 2 IGNITION COIL PULSE)	Drives No. 2 ignition coil	
16	WHT	PHO2S (PRIMARY HEATED OXYGEN SENSOR, SENSOR 1)	Detects primary heated oxygen sensor (sensor 1) signal	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
17	GRN/RED	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
18	GRN/YEL	SG2 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times.
19	YEL/RED	VCC1 (SENSOR VOLTAGE)	Power source to MAP sensor	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
20	GRN	TDCP (CAMSHAFT POSITION (CMP) SENSOR (TOP DEAD CENTER (TDC) SENSOR) A P SIDE)	Detect CMP (TDC) sensor A	With engine running: pulses
21	RED	TDCM (CAMSHAFT POSITION (CMP) SENSOR (TOP DEAD CENTER (TDC) SENSOR) A M SIDE)	Ground for CMP (TDC) sensor A	
22	RED/BLU	KS (KNOCK SENSOR)	Detects KS signal	With engine knocking: pulses
23	BRN/WHT	IGPLS 6 (No. 6 IGNITION COIL PULSE)	Drives No. 6 ignition coil	With ignition switch ON (II): 0V With engine running: pulses
24	BLU/YEL	TATF (ATF TEMPERATURE SENSOR)	Detects ATF temperature sensor signal	With ignition switch ON (II): about 0.1 – 4.2 V (depending on ATF temperature)
25	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal	With ignition switch ON (II): about 0.1 – 4.8 V (depending on intake air temperature)
26	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal	With ignition switch ON (II): about 0.1 – 4.8 V (depending on engine coolant temperature)
27	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
28	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
29	YEL	TDC2P (CAMSHAFT POSITION (CMP) SENSOR (TOP DEAD CENTER (TDC) SENSOR) B P SIDE)	Detects CMP (TDC) sensor B	With engine running: pulses
30	BLK	TDC2M (CAMSHAFT POSITION (CMP) SENSOR (TOP DEAD CENTER (TDC) SENSOR) B M SIDE)	Ground for CMP (TDC) sensor B	

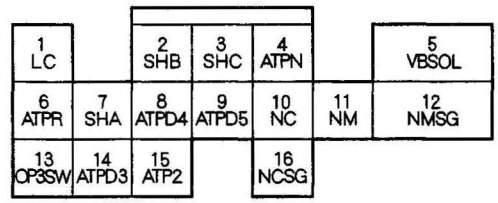
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector D (16P) — '02-03 Models



Wire side of female terminals

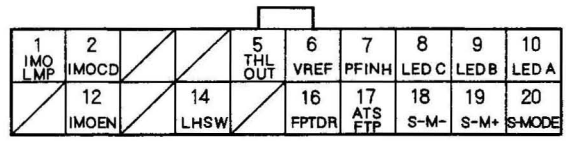
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL	LC (LOCK-UP CONTROL SOLENOID VALVE)	Drives lock-up control solenoid valve	With lock-up ON: battery voltage With lock-up OFF: 0 V
2	GRN/WHT	SHB (SHIFT CONTROL SOLENOID VALVE B)	Drives shift control solenoid valve B	With engine running in 1st, 2nd gears: battery voltage With engine running in 3rd, 4th gears: about 0 V
3	GRN	SHC (SHIFT CONTROL SOLENOID VALVE C)	Drives shift control solenoid valve C	With engine running in 1st and 3rd gears: battery voltage With the engine running in 2nd and 4th gears: 0 V
4	RED/BLK	ATPN (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal	In Neutral position: 0V In any other position: battery voltage
5	BLK/YEL	VBSOL (BATTERY VOLTAGE FOR SOLENOID VALVE)	Power source of solenoid valve	With ignition switch ON (II): battery voltage
6	WHT	ATPR (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal	In R position: 0 V In any other position: battery voltage
7	BLU/YEL	SHA (SHIFT CONTROL SOLENOID VALVE A)	Drives shift control solenoid valve A	With engine running in 2nd, 3rd gears: battery voltage With engine running in 1st, 4th gears: about 0 V
8	YEL	ATPD4 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal	In D4 position: 0 V In any other position: battery voltage
9	YEL/GRN	ATPD5 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal	In D5 position: 0 V In any other position: approx. 5.0 V
10	BLU	NC (COUNTERSHAFT SPEED SENSOR)	Detects countershaft speed sensor signals	With ignition switch ON (II), and front wheels rotating: pulses
11	RED	NM (MAINSHAFT SPEED SENSOR)	Detects mainshaft speed sensor signals	With engine running: pulses
12	WHT	NMSG (MAINSHAFT SPEED SENSOR GROUND)	Ground for mainshaft speed sensor	
13	BLU/WHT	OP3SW (3RD OIL PRESSURE SWITCH)	Detects 3rd oil pressure switch	With ignition switch ON (II): battery voltage
14	RED	ATPD3 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal	In D3 position: 0 V In any other position: battery voltage
15	BLU	ATP2 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal	In 2nd position: 0 V In any other position: battery voltage
16	GRN	NCSG (COUNTERSHAFT SPEED SENSOR GROUND)	Ground for countershaft speed sensor	

BACK

Protected by AR

PCM Inputs and Outputs at Connector E (12P) — '02-03 Models



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	PNK	IMOLMP (IMMOBILIZER INDICATOR LIGHT)	Drives immobilizer indicator light	With immobilizer indicator light turned ON: 0V With immobilizer indicator light turned OFF: battery voltage.
2	RED	IMOCD (IMMOBILIZER CODE)	Detects immobilizer signal	
5**	YEL/GRN	THLOUT (THROTTLE POSITION SENSOR OUTPUT SIGNAL)	Sends TP sensor signal	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
6**	ORN/GRN	VREF (REFERENCE VOLTAGE)	Provides reference voltage to ABS/TCS control unit	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
7**	BLU	PFINH (POWERTRAIN TO FRAME INHIBITION)	Sends TCS operation permission signal	Permission (normal): about 2.5 V Inhibition (engine coolant temperature below 32°F (0°C): about 5 V Failure (TCS and/or PCM is failure): about 0 V
8	BLU/BLK	LED C	Drives shift indicator	In sequential sportshift mode: • in 1st and 3rd gear positions: battery voltage • in 2nd and 4th gear position: 0 V
9	BLU/GRN	LED B	Drives shift indicator	In sequential sportshift mode: • in 1st and 3rd gear positions: battery voltage • in 2nd and 4th gear position: 0 V
10	BLU/RED	LED A	Drives shift indicator	In sequential sportshift mode: • in 4th gear positions: battery voltage • in 1st, 2nd and 3rd gear position: 0 V
12	BLU	IMOEN (IMMOBILIZER ENABLE SIGNAL)	Sends immobilizer enable signal	
14	BRN	LHSW (1ST HOLD SWITCH)	Detects 1st switch signal	With LH switch ON: 0 V With LH switch OFF: battery voltage
16**	PNK	FPTDR (FRAME TO POWERTRAIN TORQUE DOWN REQUEST)	Detects engine retard request signal	With TCS operating : about 5 V With TCS not operating: about 2.5 V
17**	LT GRN	ATSFTP (A/T GEAR POSITION SWITCH OUTPUT SIGNAL)	Sends A/T gear position switch signal	With engine running in park position: about 4 V
18	ORN	S−M−	Detects downshift switch signal	In sequential sportshift mode and shift lever pushed toward downshift position (maked with "−"): 0 V In sequential sportshift mode and shift lever in neutral position: battery voltage
19	YEL	S−M+	Detects upshift switch signal	In sequential sportshift mode and shift lever pushed toward upshift position (maked with "+"): 0 V In sequential sportshift mode and shift lever in neutral position: battery voltage
20	RED	S−MODE	Detects sequential sportshift mode switch signal	In sequental sportshift mode (shift lever is positioned in sequential sportshift mode): 0 V In other than sequential sportshift mode: battery voltage

**: J32A1 engine

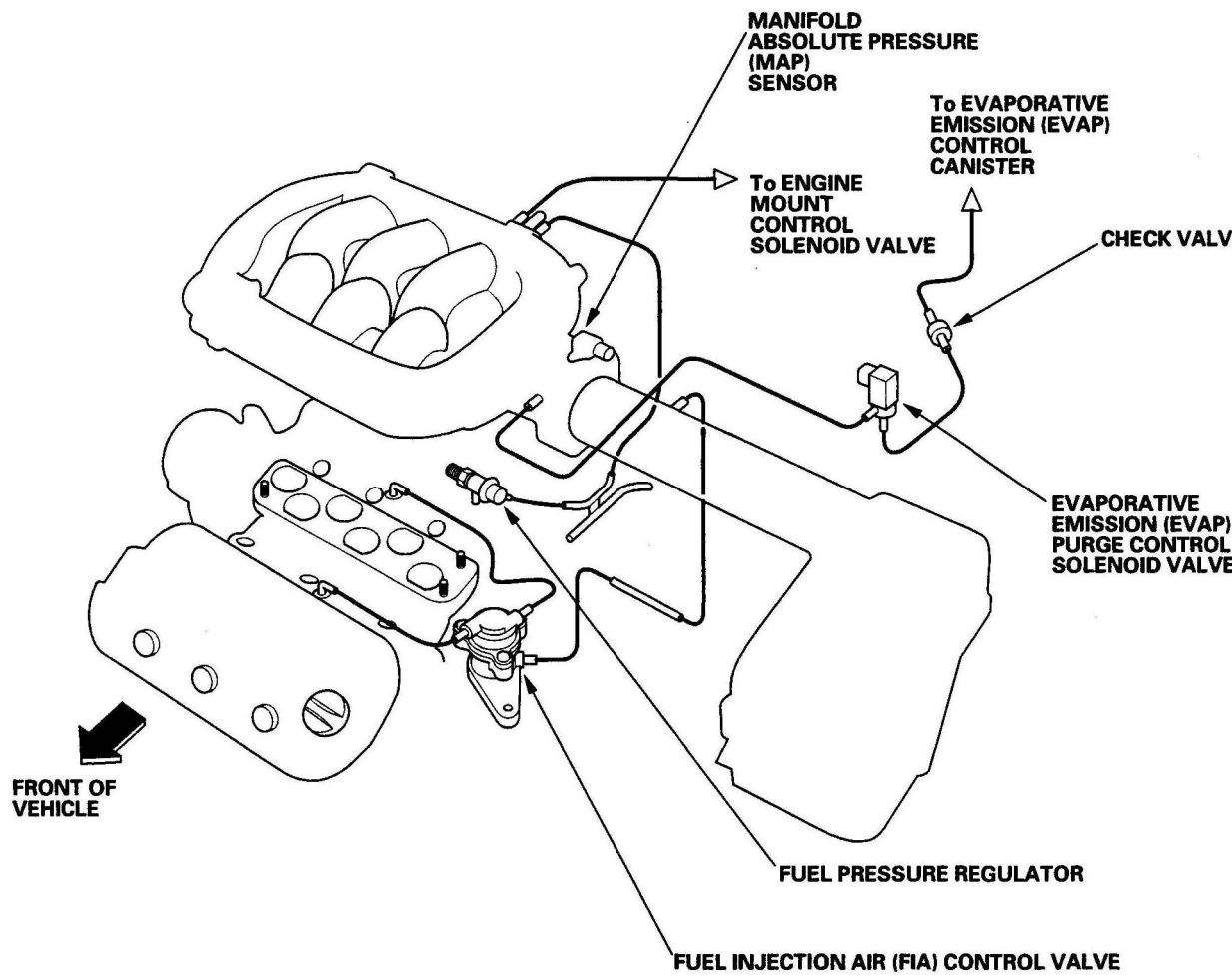
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

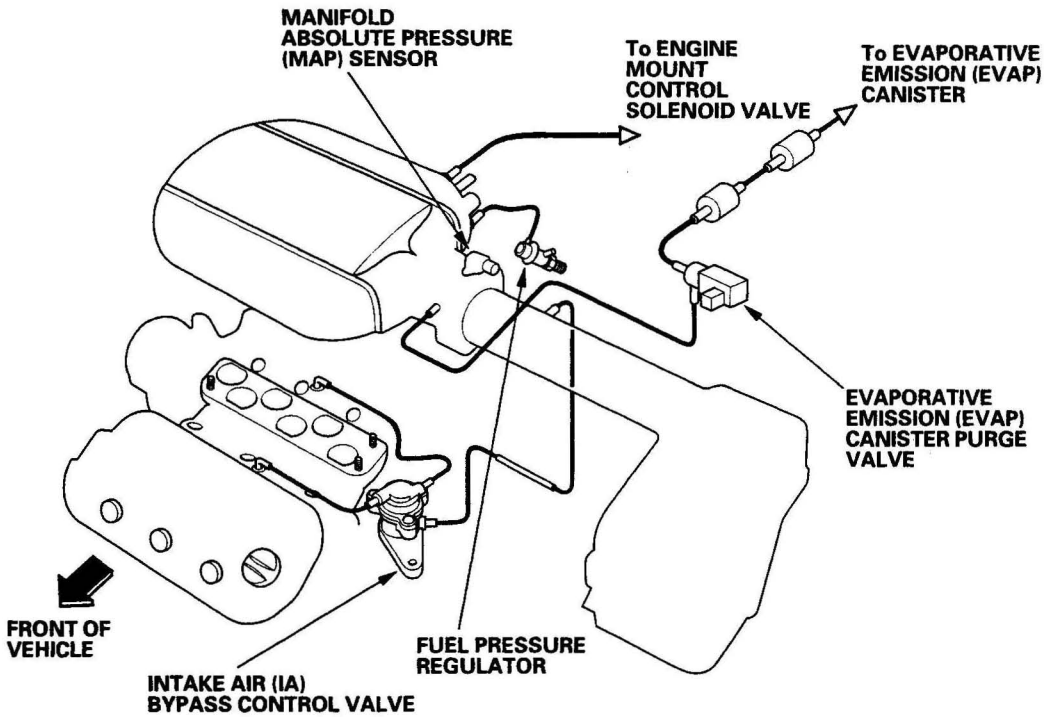
Vacuum Hose Routing — J32A1 engine ('99 Model)



BACK

Protected by AR

Vacuum Hose Routing — J32A1 engine ('00-03 Models)



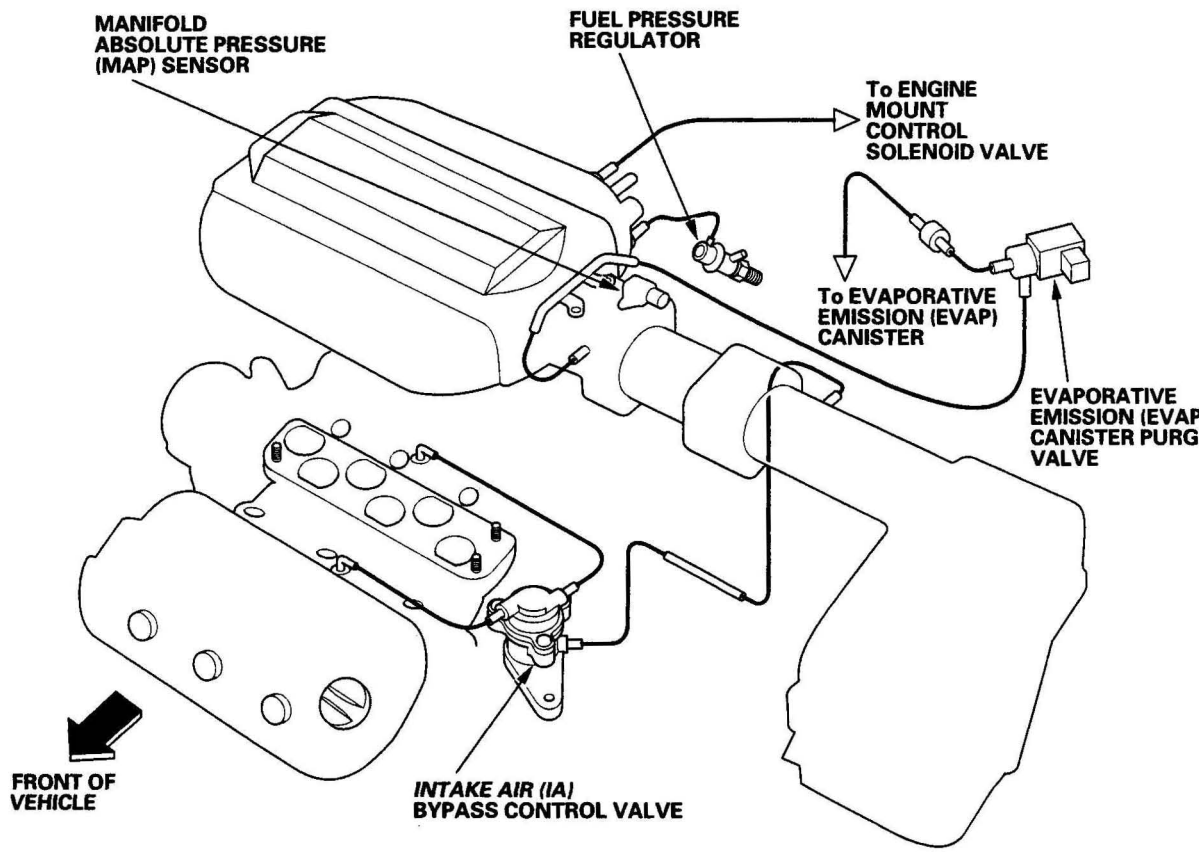
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

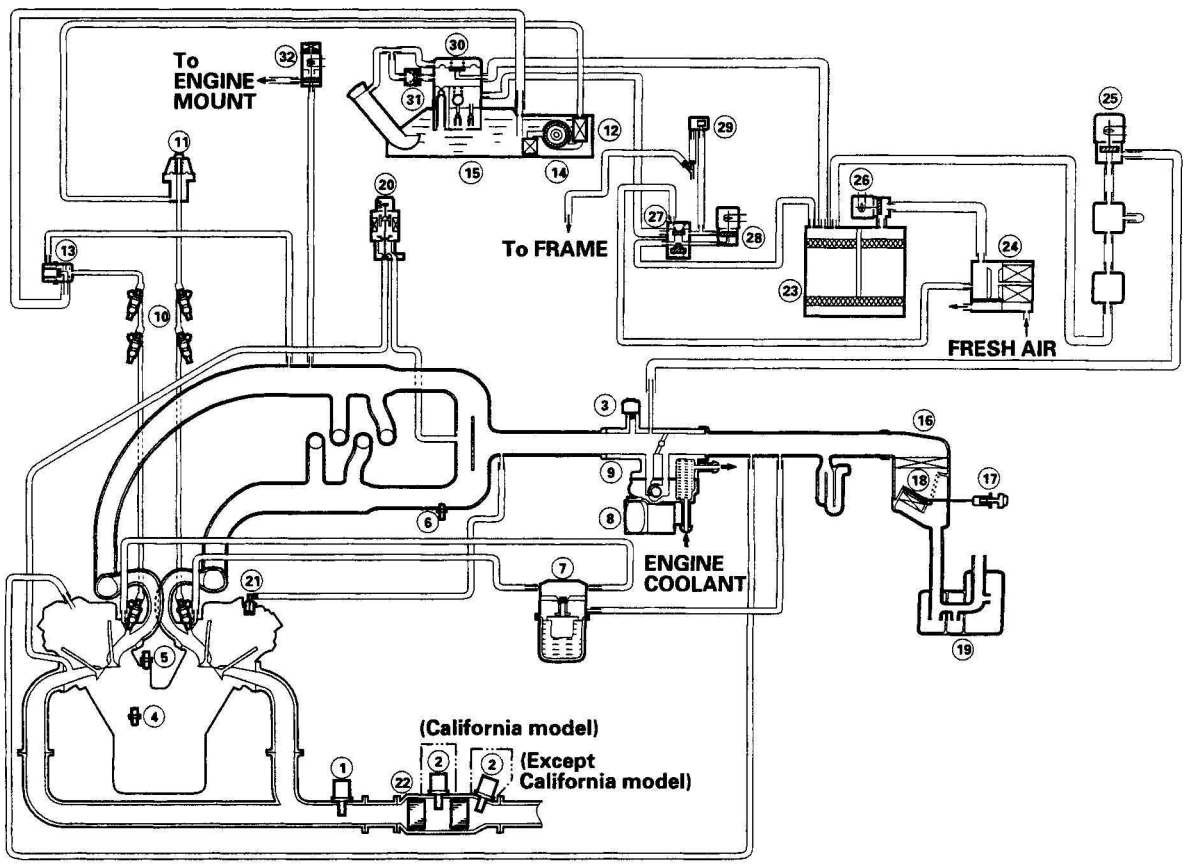
Vacuum Hose Routing — J32A2 engine



BACK

Protected by AR

Vacuum Distribution — J32A1 engine ('99 Model)



① PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1)
② SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
③ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
④ ENGINE COOLANT TEMPERATURE (ECT) SENSOR
⑤ KNOCK SENSOR
⑥ INTAKE AIR TEMPERATURE (IAT) SENSOR
⑦ FUEL INJECTION AIR (FIA) CONTROL VALVE
⑧ IDLE AIR CONTROL (IAC) VALVE
⑨ THROTTLE BODY
⑩ FUEL INJECTOR
⑪ FUEL PULSATION DAMPER
⑫ FUEL FILTER
⑬ FUEL PRESSURE REGULATOR
⑭ FUEL PUMP
⑮ FUEL TANK
⑯ AIR CLEANER
⑰ AIR TEMPERATURE CONTROL VALVE
⑱ AIR VALVE
⑲ RESONATOR
⑳ EXHAUST GAS RECIRCULATION (EGR) VALVE and LIFT SENSOR
㉑ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
㉒ THREE WAY CATALYTIC CONVERTER
㉓ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
㉔ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER FILTER
㉕ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE
㉖ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE
㉗ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
㉘ EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
㉙ FUEL TANK PRESSURE SENSOR
㉚ ONBOARD REFUELING VAPOR RECOVERY (ORVR) VENT SHUT VALVE
㉛ ONBOARD REFUELING VAPOR RECOVERY (ORVR) VAPOR RECIRCULATION VALVE
㉜ ENGINE MOUNT CONTROL SOLENOID VALVE

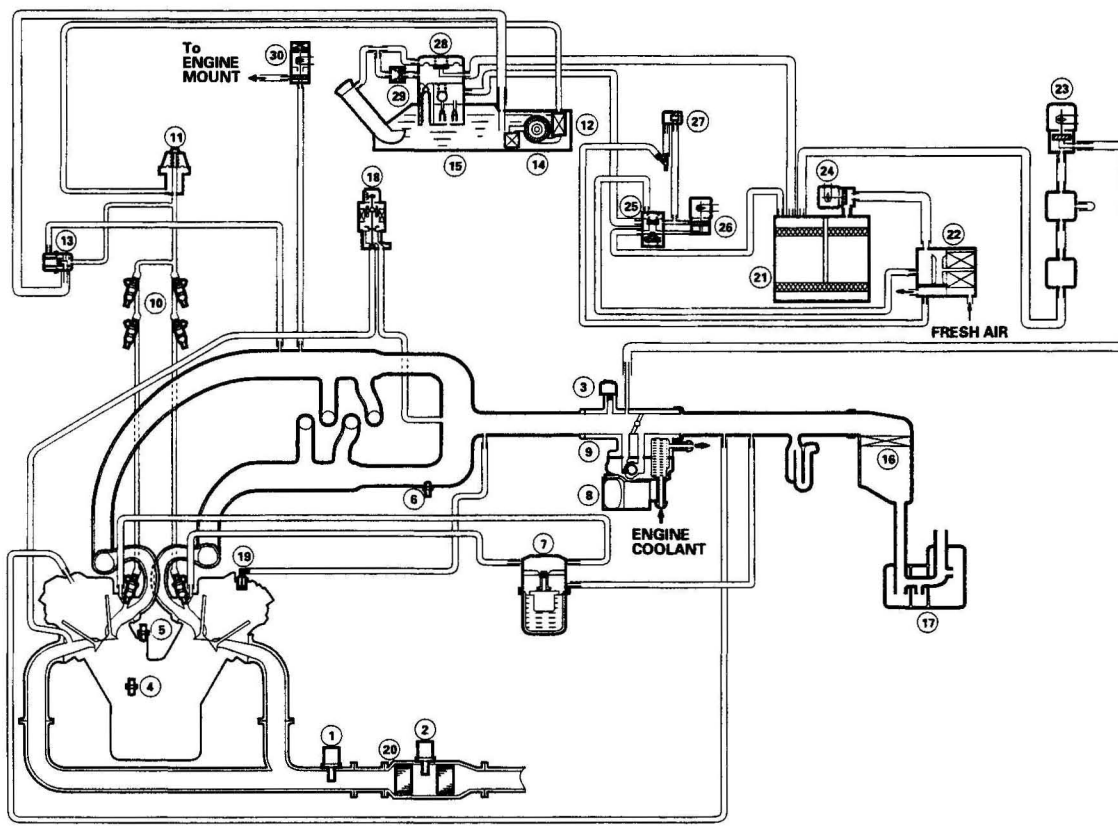
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

Vacuum Distribution – J32A1 engine ('00-03 Models)

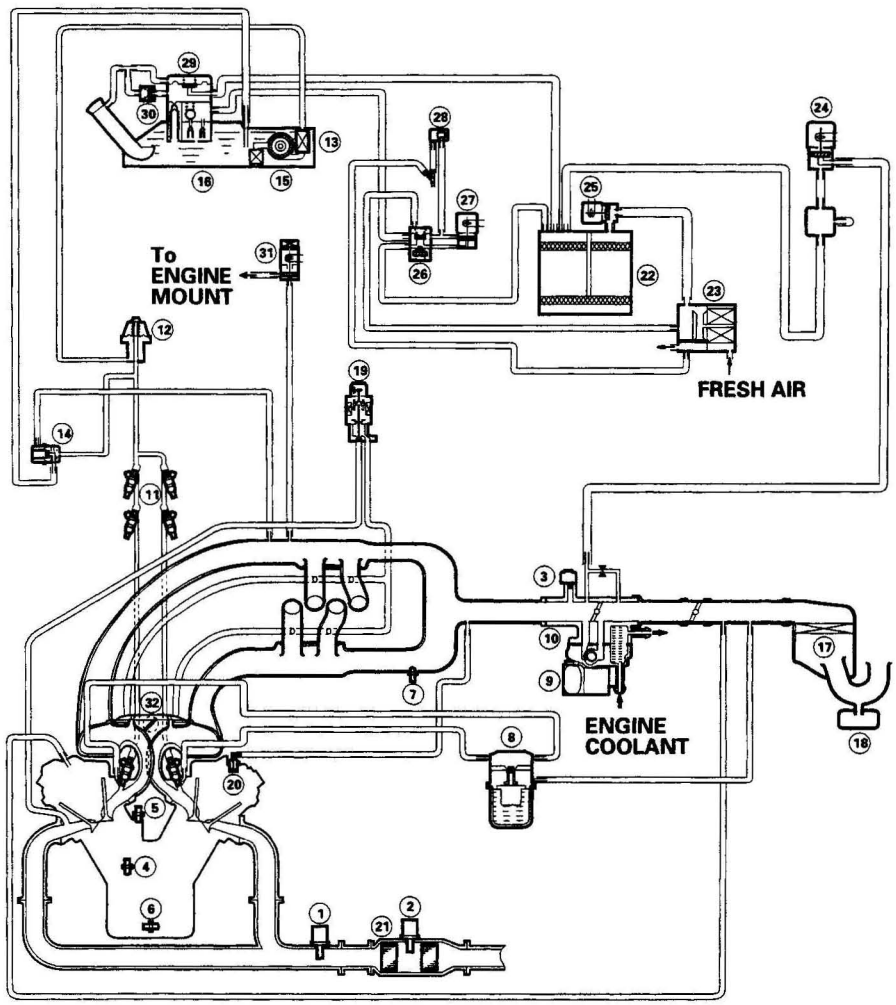


① PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1)
② SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
③ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
④ ENGINE COOLANT TEMPERATURE (ECT) SENSOR
⑤ KNOCK SENSOR
⑥ INTAKE AIR TEMPERATURE (IAT) SENSOR
⑦ INTAKE AIR BYPASS CONTROL VALVE
⑧ IDLE AIR CONTROL (IAC) VALVE
⑨ THROTTLE BODY
⑩ INJECTOR
⑪ FUEL PULSATION DAMPER
⑫ FUEL FILTER
⑬ FUEL PRESSURE REGULATOR
⑭ FUEL PUMP
⑮ FUEL TANK
⑯ AIR CLEANER
⑰ RESONATOR
⑱ EXHAUST GAS RECIRCULATION (EGR) VALVE and POSITION SENSOR
⑲ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
⑳ THREE WAY CATALYTIC CONVERTER
㉑ EVAPORATIVE EMISSION (EVAP) CANISTER
㉒ EVAPORATIVE EMISSION (EVAP) CANISTER FILTER
㉓ EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE
㉔ EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE
㉕ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
㉖ EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
㉗ FUEL TANK PRESSURE (FTP) SENSOR
㉘ FUEL TANK VAPOR CONTROL VALVE
㉙ FUEL TANK VAPOR RECIRCULATION VALVE
㉚ ENGINE MOUNT CONTROL SOLENOID VALVE

BACK

Protected by AR

Vacuum Distribution – J32A2 engine



① PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1)
② SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
③ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
④ ENGINE COOLANT TEMPERATURE (ECT) SENSOR
⑤ KNOCK SENSOR
⑥ ATF TEMPERATURE SENSOR
⑦ INTAKE AIR TEMPERATURE (IAT) SENSOR
⑧ INTAKE AIR (IA) BYPASS CONTROL VALVE
⑨ IDLE AIR CONTROL (IAC) VALVE
⑩ THROTTLE BODY
⑪ INJECTOR
⑫ FUEL PULSATION DAMPER
⑬ FUEL FILTER
⑭ FUEL PRESSURE REGULATOR
⑮ FUEL PUMP (FP)
⑯ FUEL TANK
⑰ AIR CLEANER
⑱ RESONATOR
⑲ EXHAUST GAS RECIRCULATION (EGR) VALVE and POSITION SENSOR
⑳ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
㉑ THREE WAY CATALYTIC CONVERTER
㉒ EVAPORATIVE EMISSION (EVAP) CANISTER
㉓ EVAPORATIVE EMISSION (EVAP) CANISTER FILTER
㉔ EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE
㉕ EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE
㉖ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
㉗ EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
㉘ FUEL TANK PRESSURE SENSOR
㉙ FUEL TANK VAPOR CONTROL VALVE
㉚ FUEL TANK VAPOR RECIRCULATION VALVE
㉛ ENGINE MOUNT CONTROL SOLENOID VALVE
㉜ INTAKE MANIFOLD RUNNER CONTROL (IMRC) VALVE

(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PGM-FI System

The Programmed Fuel Injection (PGM-FI) system is a sequential multiport fuel injection system.

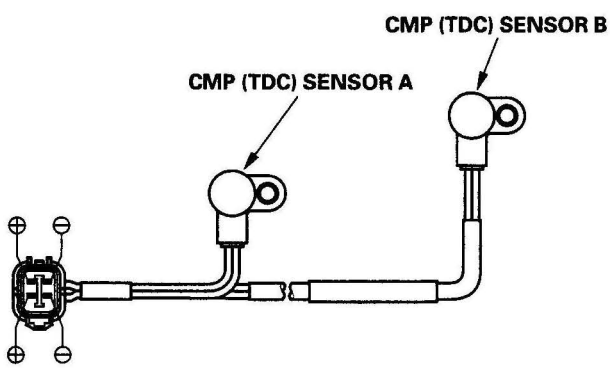
Alternator Control
The alternator signals the PCM during charging. The PCM then controls the voltage generated at the alternator according to the electrical load determined by the Electrical Load Detector (ELD) and driving mode. This reduces engine load to improve fuel economy.

A/C Switch
The A/C (air conditioning) switch signals the PCM whenever there is a demand for cooling.

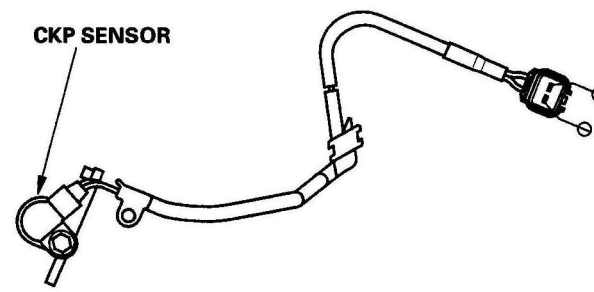
A/C Compressor Clutch Relay
When the PCM receives a demand for cooling from the A/C system, it delays the compressor from being energized, and enriches the mixture to assure smooth transition to the A/C mode.

Barometric Pressure (BARO) Sensor
The Baro sensor is inside the PCM. It converts atmospheric pressure into a voltage signal that modifies the basic duration of the fuel injection discharge.

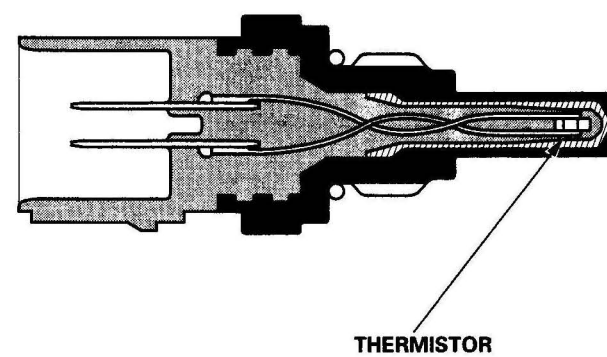
Camshaft Position (CMP) Sensors (Top Dead Center (TDC) Sensors: '99-01 models)
The CMP (TDC) sensors determine ignition timing at start up (cranking) and when crank angle is abnormal.



Crankshaft Position (CKP) Sensor
The CKP sensor determines timing for injection of each cylinder and also detects engine speed and misfire.



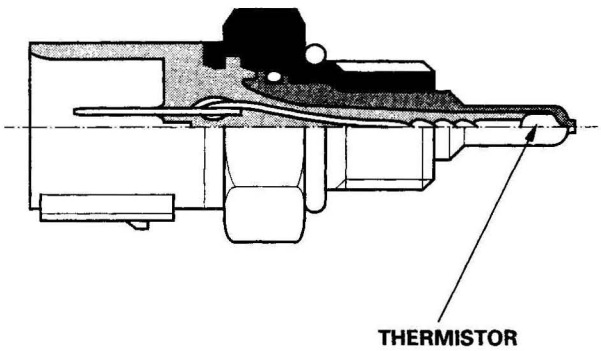
Engine Coolant Temperature (ECT) Sensor
The ECT sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases.



BACK

Protected by AR

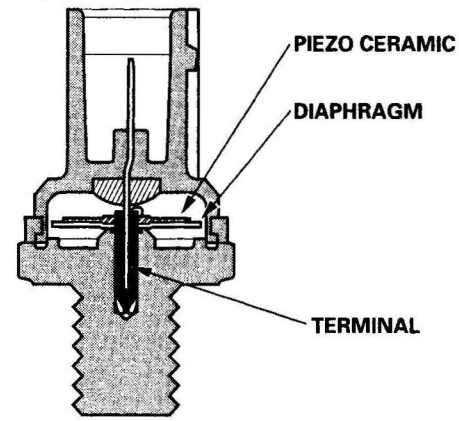
Intake Air Temperature (IAT) Sensor
The IAT sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases.



Ignition Timing Control
The PCM contains the memory for basic ignition timing at various engine speeds and manifold absolute pressure. It also adjusts the timing according to engine coolant temperature.

Injector Timing and Duration
The PCM contains the memory for basic discharge duration at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.
By monitoring Long Term Fuel Trim, the PCM detects long term malfunctions in the fuel system, and will set a Diagnostic Trouble Code (DTC).

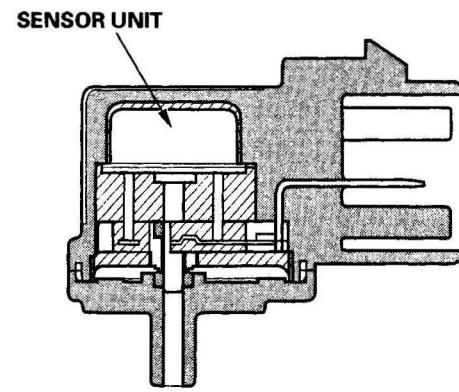
Knock Sensor
The knock control system adjusts the ignition timing for the octane rating of the gasoline used.



Malfunction Indicator Lamp (MIL) Indication (In relation to Readiness Codes)
The vehicle has certain "readiness codes" that are part of the on-board diagnostics for the emissions systems. If the vehicle's battery has been disconnected or gone dead, these codes are erased. In some states, part of the emissions testing is to make sure these codes are set. If all of them are not set, the test cannot be completed.

To check if the readiness codes are set, turn the ignition switch ON (II), but do not start the engine. The MIL will come on for 15—20 seconds. If it then goes off, the readiness codes are set. If it blinks several times, the readiness codes are not set completely. To reset each code, drive the vehicle or run the engine as described in the procedures to set them in this section.

Manifold Absolute Pressure (MAP) Sensor
The MAP sensor converts manifold absolute pressure into electrical signals to the PCM.



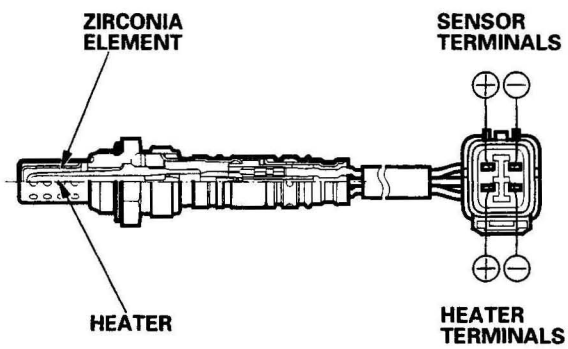
(cont'd)

BACK

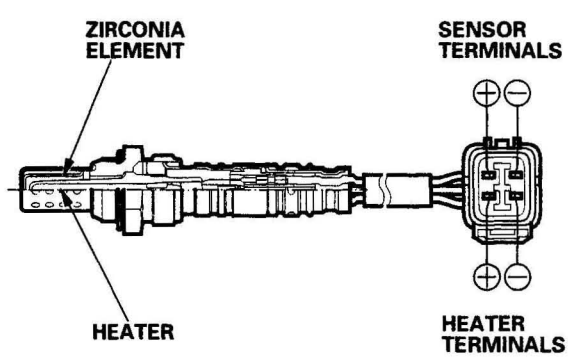
Protected by AR

System Descriptions (cont'd)

Primary Heated Oxygen Sensors (Primary HO2S)
The primary HO2S detects the oxygen content in the exhaust gas and sends signals to the PCM which varies the duration of injection accordingly. To stabilize its output, the sensor has an internal heater. The Primary HO2S is installed in the exhaust manifold.
By controlling the air fuel ratio with primary HO2S and secondary HO2S, the deterioration of the primary HO2S can be evaluated by its feedback period. When the feedback period exceeds a certain value during stable driving conditions, the sensor is considered deteriorated and the PCM sets a DTC.

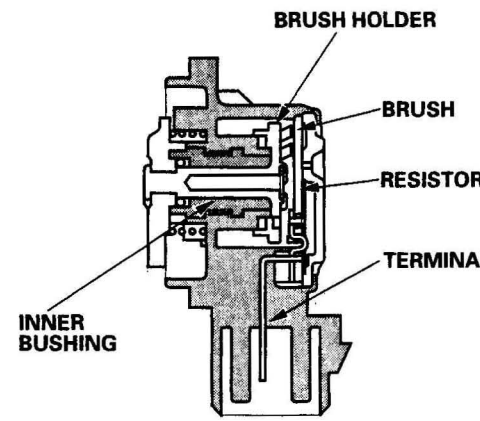


Secondary Heated Oxygen Sensor (Secondary HO2S)
The secondary HO2S detects the oxygen content in the exhaust gas in the downstream of the Three Way Catalytic Converter (TWC) and sends signals to the PCM which varies the duration of injection accordingly. To stabilize its output, the sensor has an internal heater. The secondary HO2S is installed in the TWC.



Starting Control
When the engine is started, the PCM provides a rich mixture by increasing injector duration.

Throttle Position (TP) Sensor
The TP sensor is a potentiometer connected to the throttle valve shaft. As the throttle position changes, the sensor varies the signal voltage to the PCM. The TP sensor is not replaceable apart from the throttle body.



BACK

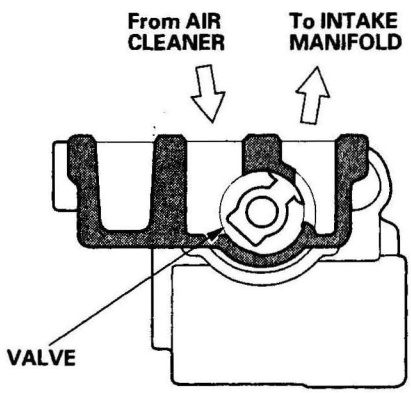
Protected by AR

Idle Control System

When the engine is cold, the A/C compressor is on, the transmission is in gear, the brake pedal is pressed, the P/S load is high, or the alternator is charging, the PCM controls current to the IAC valve to maintain the correct idle speed. Refer to the System Diagram to see the functional layout of the system.

Brake Pedal Position Switch
The brake pedal position switch signals the PCM when the brake pedal is pressed.

Idle Air Control (IAC) Valve
To maintain the proper idle speed, the IAC valve changes the amount of air bypassing the throttle body in response to an electrical signal from the PCM.



Power Steering Pressure (PSP) Switch
The PSP switch signals the PCM when the power steering load is high.

Starter (Ignition) Switch
The starter switch signals the PCM when the engine is cranking.

Fuel Supply System

Fuel Cut-off Control
During deceleration with the throttle valve closed, current to the injectors is cut off to improve fuel economy at speeds over 1,100 rpm.
Fuel cut-off action also occurs when engine speed exceeds 6,600 rpm, regardless of the position of the throttle valve, to protect the engine from over-revving.
When the vehicle is stopped, the PCM cuts the fuel at engine speeds over 5,000 rpm.

Fuel Pump Control
When the ignition switch is turned ON (II), the PCM grounds the PGM-FI main relay which feeds current to the fuel pump for 2 seconds to pressurize the fuel system. With the engine running, the PCM grounds the PGM-FI main relay and feeds current to the fuel pump. When the engine is not running and the ignition switch is turned ON (II), the PCM cuts ground to the PGM-FI main relay which cuts current to the fuel pump.

PGM-FI Main Relay
The PGM-FI relay contains 2 separate relays. One is energized whenever the ignition switch is turned ON (II) which supplies battery voltage to the PCM, power to the injectors, and power for the second relay. The second relay is energized to supply power to the fuel pump for 2 seconds when the ignition switch is turned ON (II), and when the engine is running.

(cont'd)

BACK

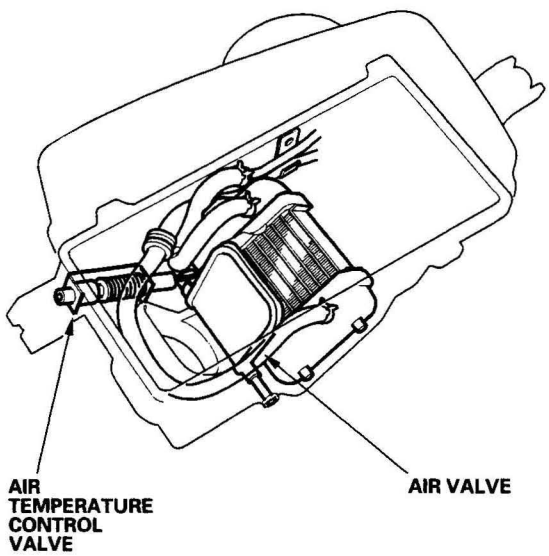
Protected by AR

System Descriptions (cont'd)

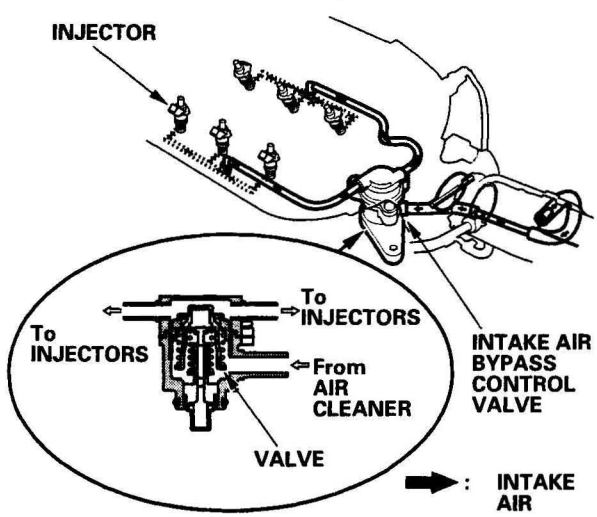
Intake Air System

Refer to the System Diagram to see the functional layout of the system.

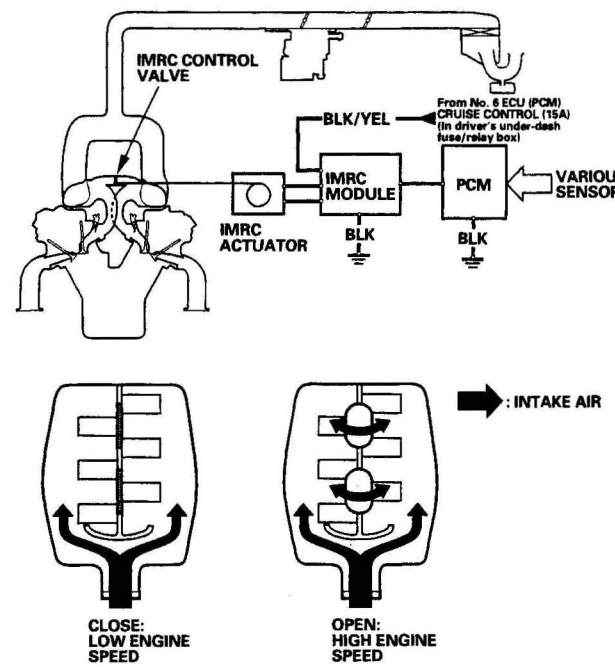
Heated Air Induction System ('99 model)
The heated air induction system improves fuel economy in cold weather conditions and when the engine is cold.
When outside air temperature is low, the air temperature control valve opens the air valve to allow heated air into the engine.



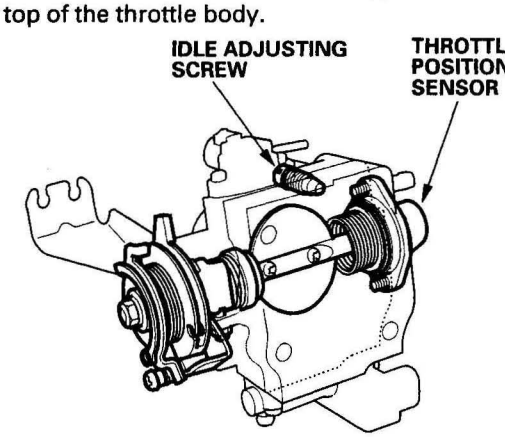
Intake Air Bypass Control System
When the engine is running, the intake air bypass control valve sends air to the injectors.



Intake Manifold Runner Control (IMRC) System (J32A2 engine)
Satisfactory power performance is achieved by closing and opening the Intake Manifold Runner Control (IMRC) control valves. High torque at low engine speed is achieved when the valves are closed, whereas high power at high engine speed is achieved when the valves are opened.



Throttle Body
The throttle body is a single-barrel side draft type. The lower portion of the throttle valve is heated by engine coolant from the cylinder head. The idle adjusting screw, which increases/decreases bypass air, is located on top of the throttle body.



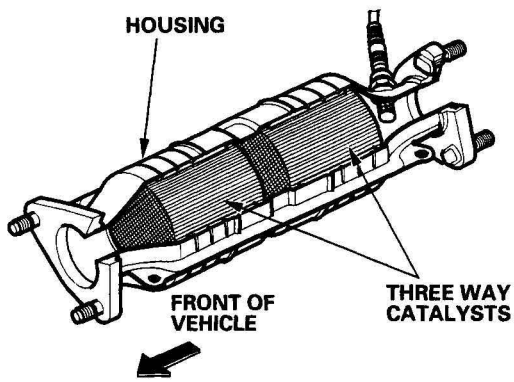
BACK

Protected by AR

Catalytic Converter System

Three Way Catalytic Converter (TWC)
The TWC converts hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas to carbon dioxide (CO2), dinitrogen (N2), and water vapor.

NOTE: The illustration shows '99 model.



Exhaust Gas Recirculation (EGR) System

Refer to the System Diagram to see the functional layout of the system.

EGR Valve
The EGR valve is designed to lower peak combustion temperatures and reduce oxides of nitrogen emissions (NOx) by recirculating exhaust gas through the intake manifold and into the combustion chambers.

(cont'd)

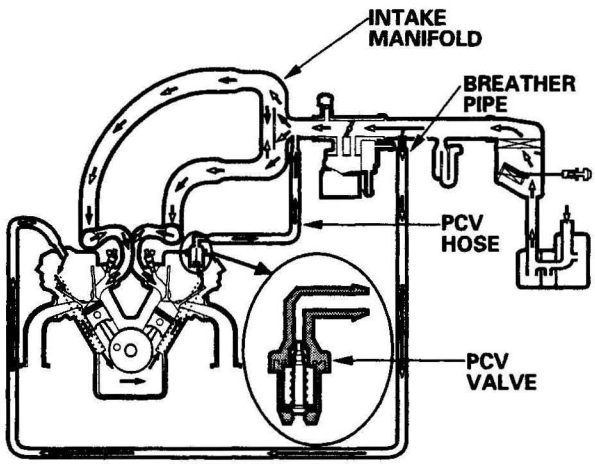
BACK

Protected by AR

System Descriptions (cont'd)

Positive Crankcase Ventilation (PCV) System

The PCV valve prevents blow-by gasses from escaping into the atmosphere by venting them into the intake manifold.



←: BLOW-BY VAPOR
←: FRESH AIR

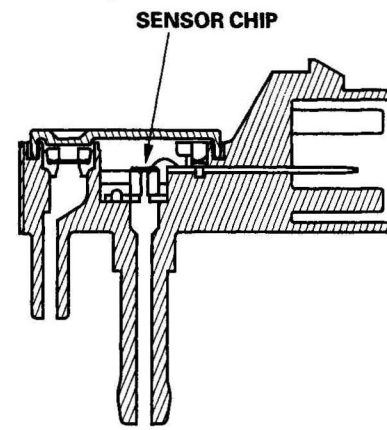
Evaporative Emission (EVAP) Control System

Refer to the System Diagram to see the functional layout of the system.

EVAP Canister
The EVAP canister temporarily stores fuel vapor from the fuel tank until it can be purged back into the engine and burned (Refer to the System Diagram to see the functional layout of the system).

EVAP Canister Purge Valve
When the engine coolant temperature is below 147°F (64°C), the PCM turns off the EVAP canister purge valve which cuts vacuum to the EVAP canister.

Fuel Tank Pressure (FTP) Sensor
The FTP sensor converts fuel tank absolute pressure into an electrical input to the PCM.



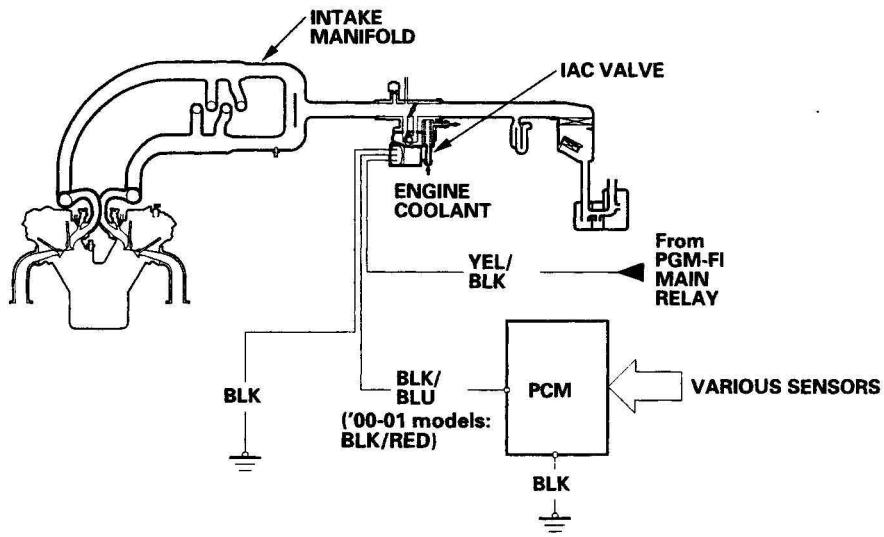
BACK

Protected by AR

Idle Control System Diagram

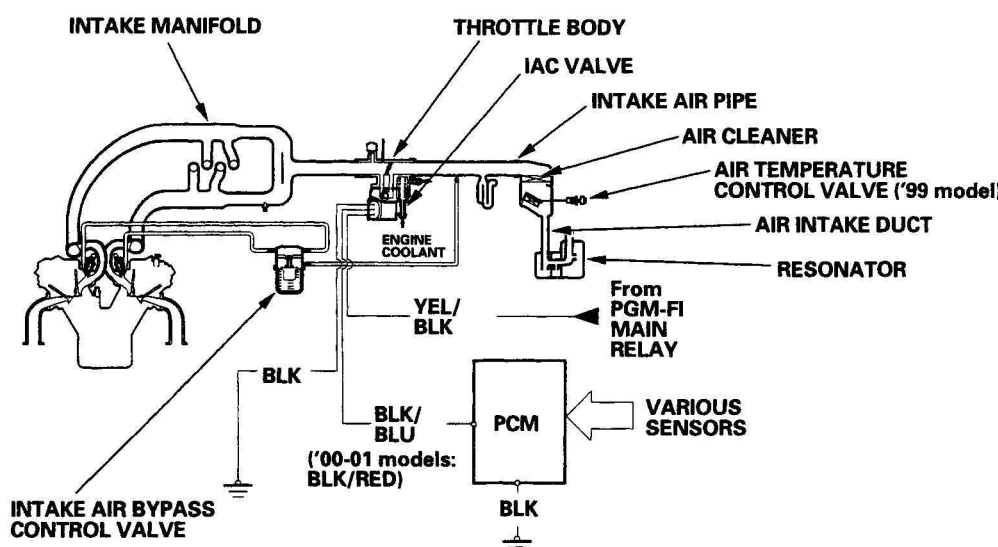
The idle speed of the engine is controlled by the idle air control (IAC) valve:

- After the engine starts, the IAC valve opens for a certain amount of time. The amount of air is increased to raise the idle speed.
- When the engine coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is thus controlled in relation to engine coolant temperature.



Intake Air System Diagram

This system supplies air for engine needs. A resonator in the intake air pipe provides additional silencing as air is drawn into the system.



(cont'd)

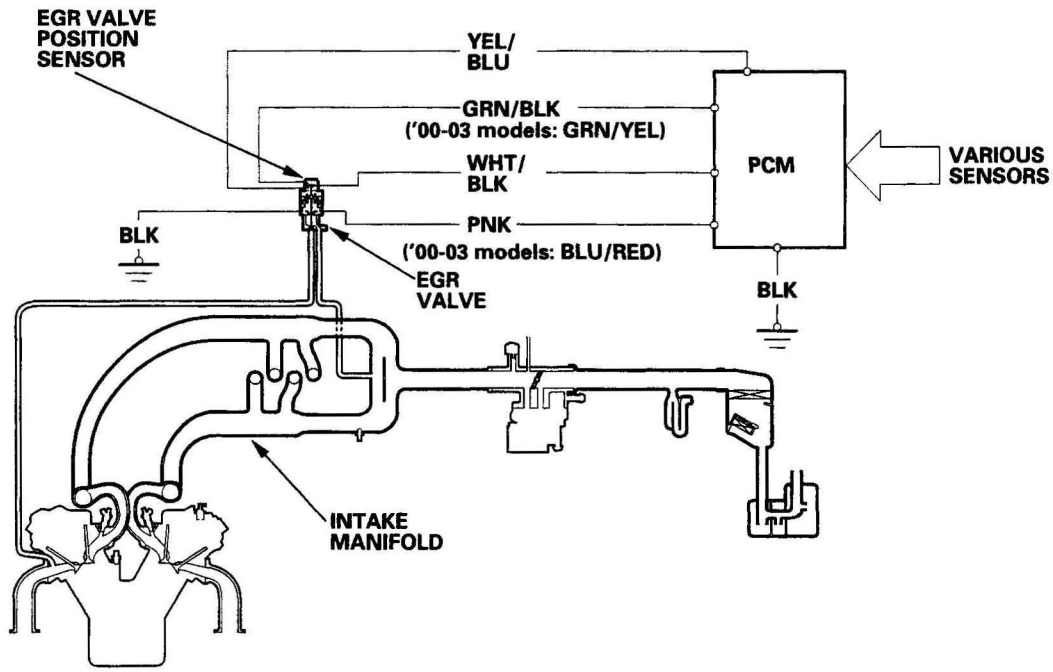
Protected by AR

System Descriptions (cont'd)

Exhaust Gas Recirculation (EGR) System Diagram

The EGR system reduces oxides of nitrogen (NOx) emissions by recirculating exhaust gas through the EGR valve and the intake manifold into the combustion chambers. The PCM memory includes the ideal EGR valve position for varying operating conditions.

The EGR valve position sensor detects the amount of EGR valve lift and sends it to the PCM. The PCM then compares it with the ideal lift in its memory (based on signals sent from other sensors). If there is any difference between the two, the PCM cuts current to the EGR valve.



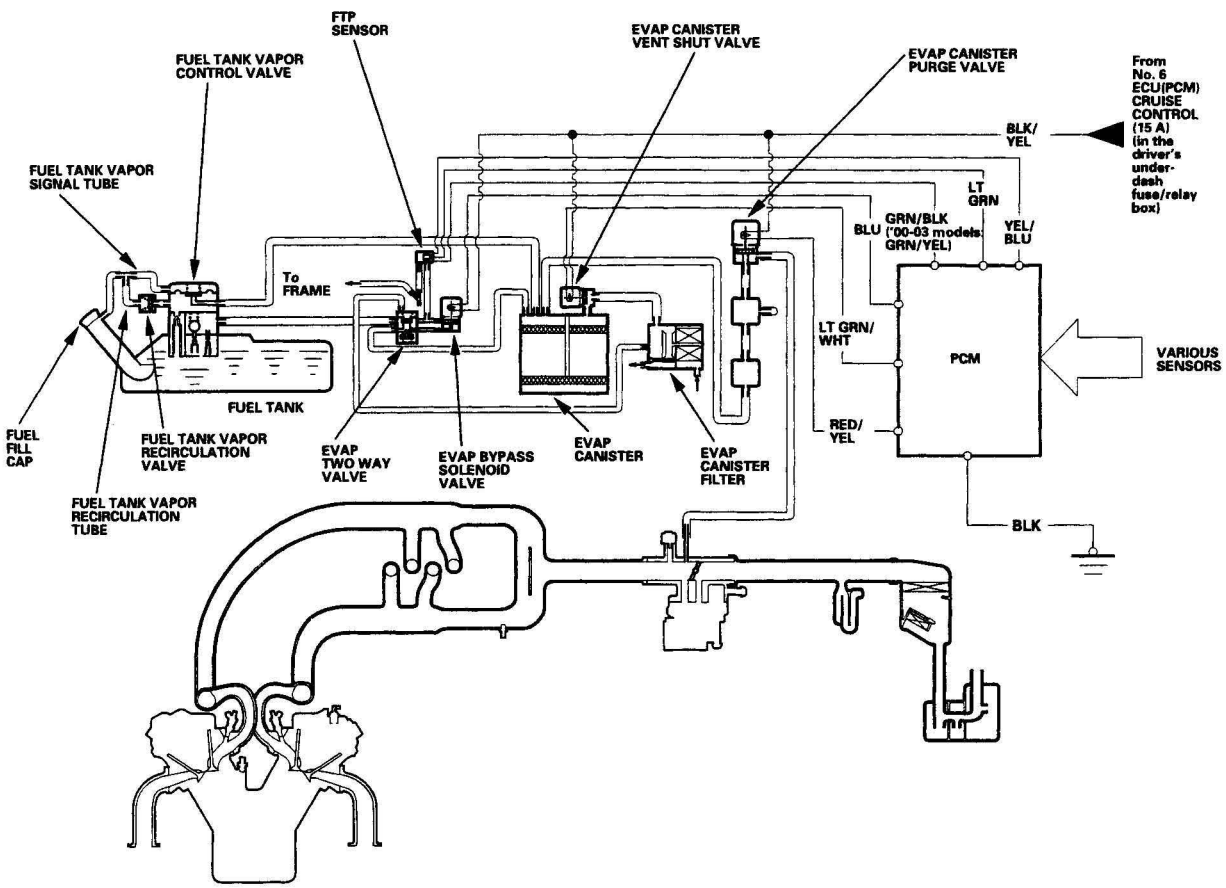
BACK

Protected by AR

Evaporative Emission (EVAP) Control Diagram

The EVAP controls minimize the amount of fuel vapor escaping to the atmosphere. Vapor from the fuel tank is temporarily stored in the EVAP canister until it can be purged from the canister into the engine and burned.

- The EVAP canister is purged by drawing fresh air through it and into a port on the throttle body. The purging vacuum is controlled by the EVAP canister purge valve, which is open whenever engine coolant temperature is above 147°F (64°C).
- When vapor pressure in the fuel tank is higher than the set value of the EVAP two way valve, the valve opens and regulates the flow of fuel vapor to the EVAP canister.
- During refueling, the fuel tank vapor control valve opens with the pressure in the fuel tank, and feeds the fuel vapor to the EVAP canister.



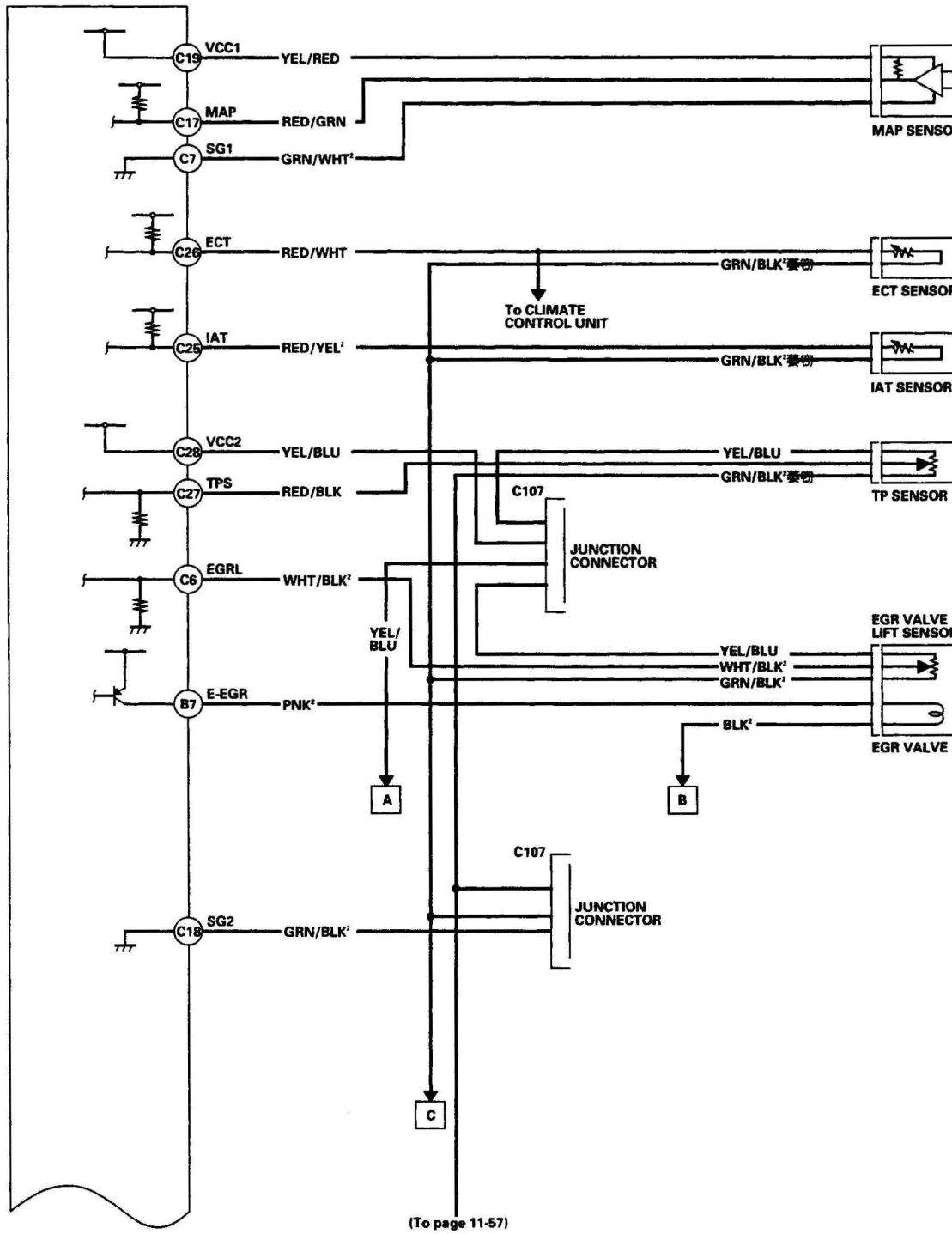
(cont'd)

BACK

Protected by AR

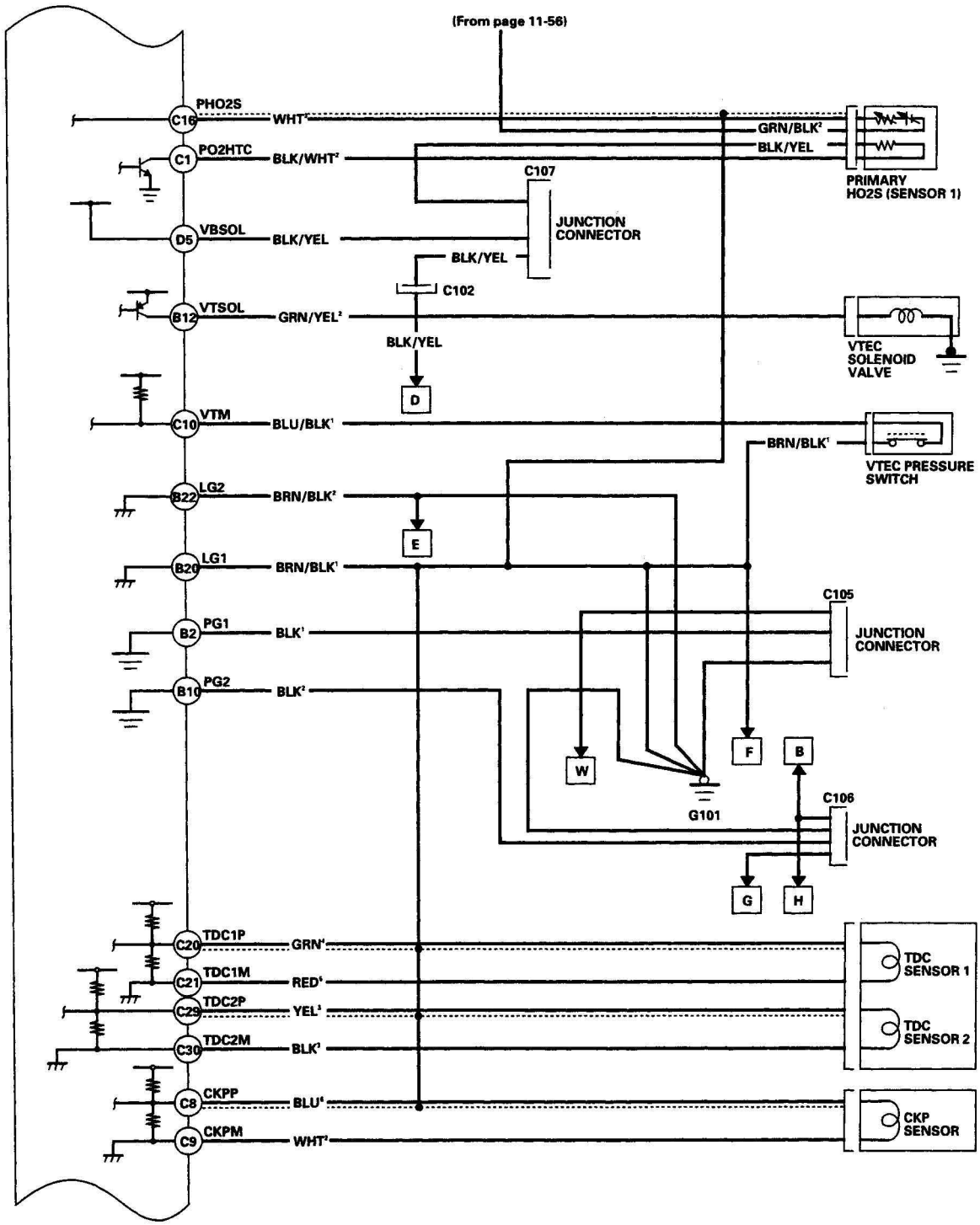
System Descriptions (cont'd)

PCM Circuit Diagram — '99 Model



BACK

Protected by AR



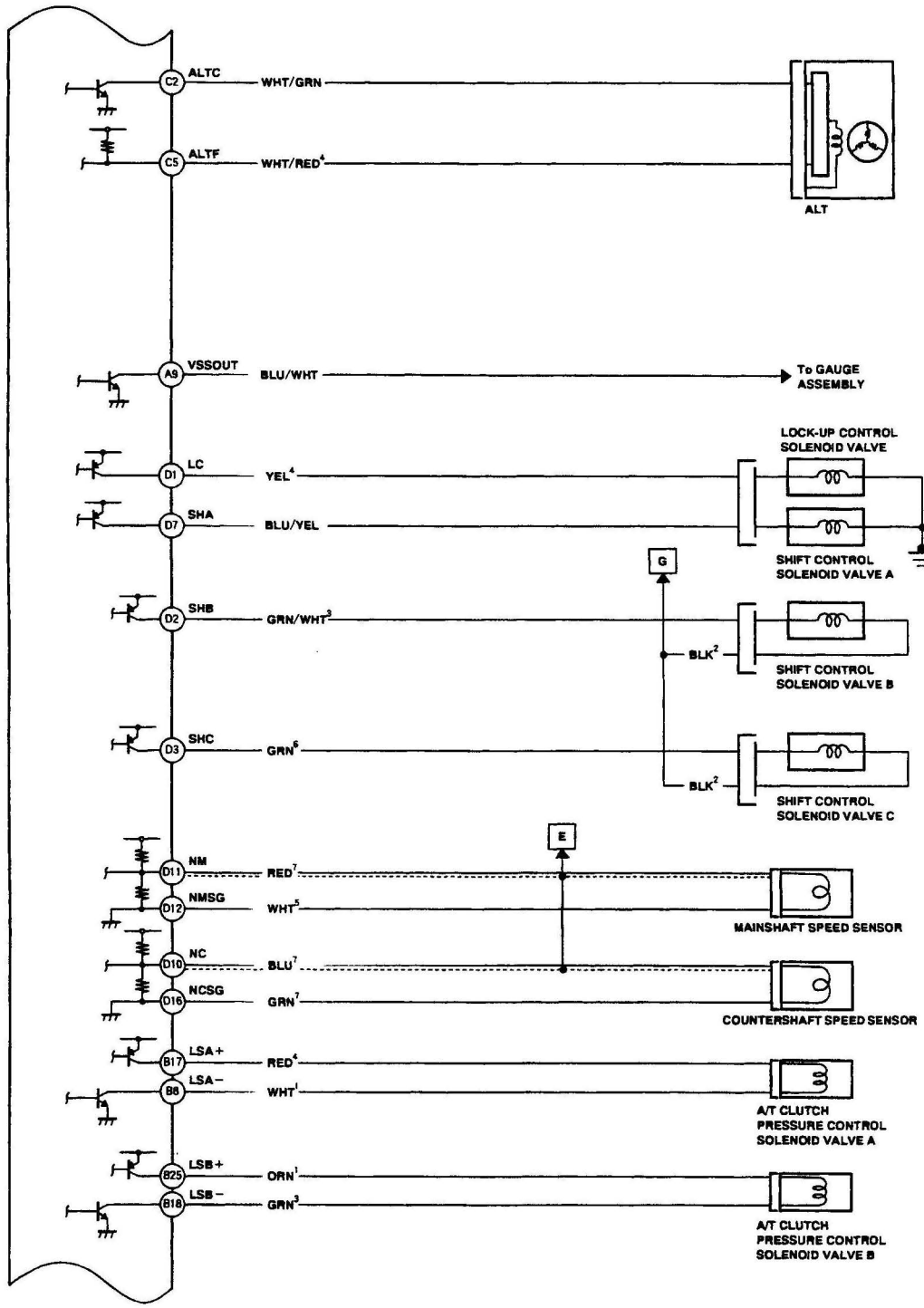
(cont'd)

BACK

Protected by AR

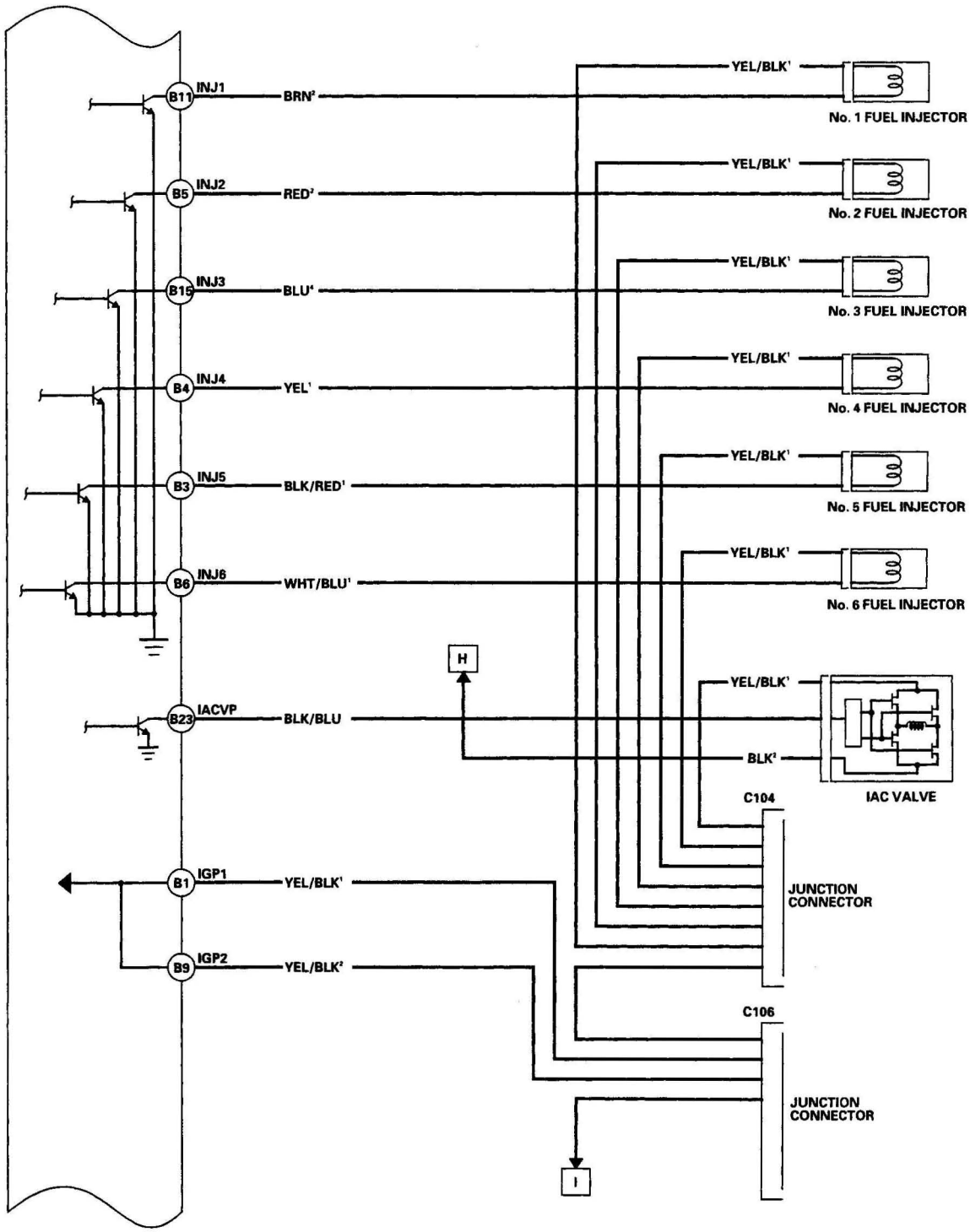
System Descriptions (cont'd)

PCM Circuit Diagram – '99 Model (cont'd)



BACK

Protected by AR



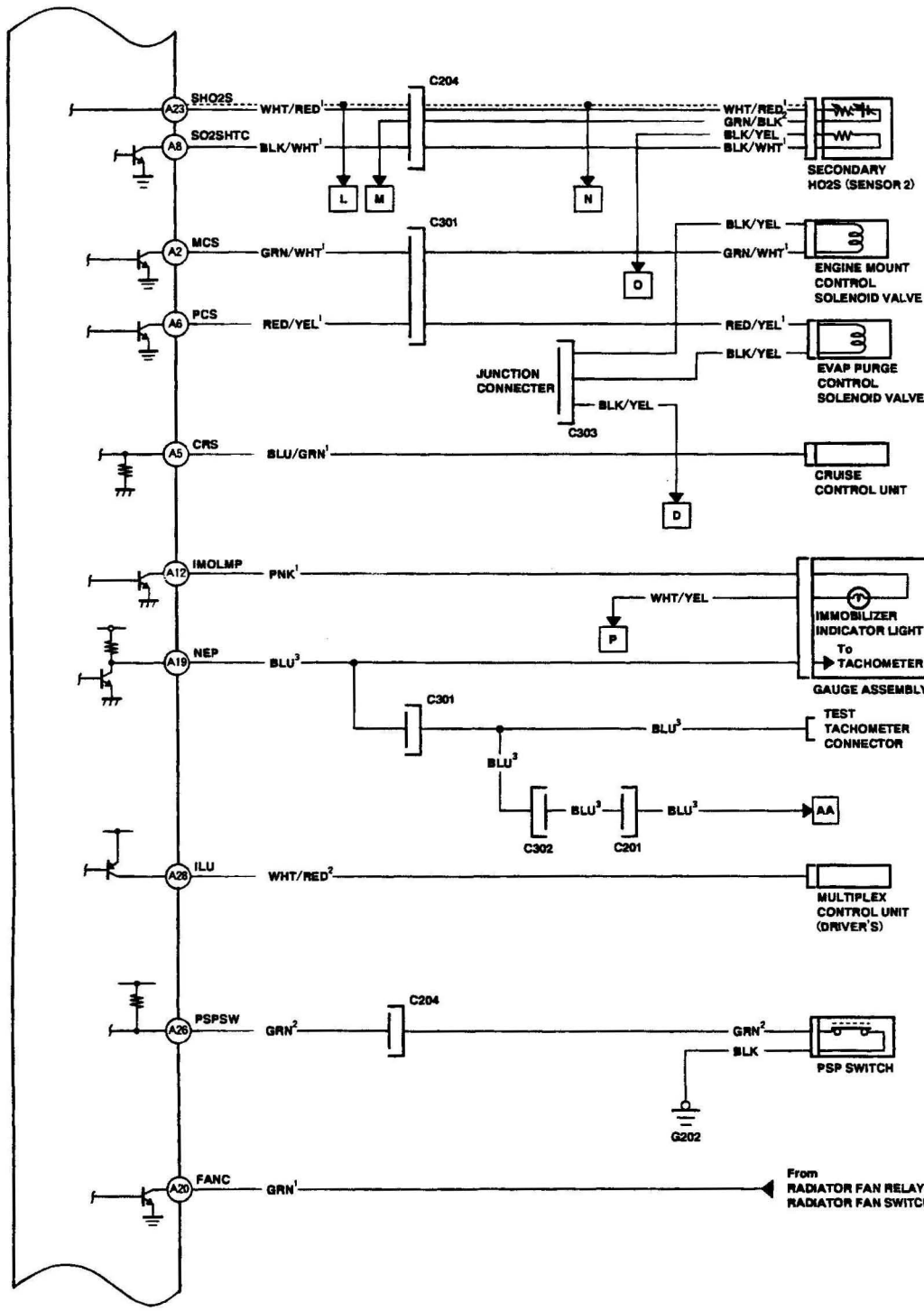
(cont'd)

BACK

Protected by AR

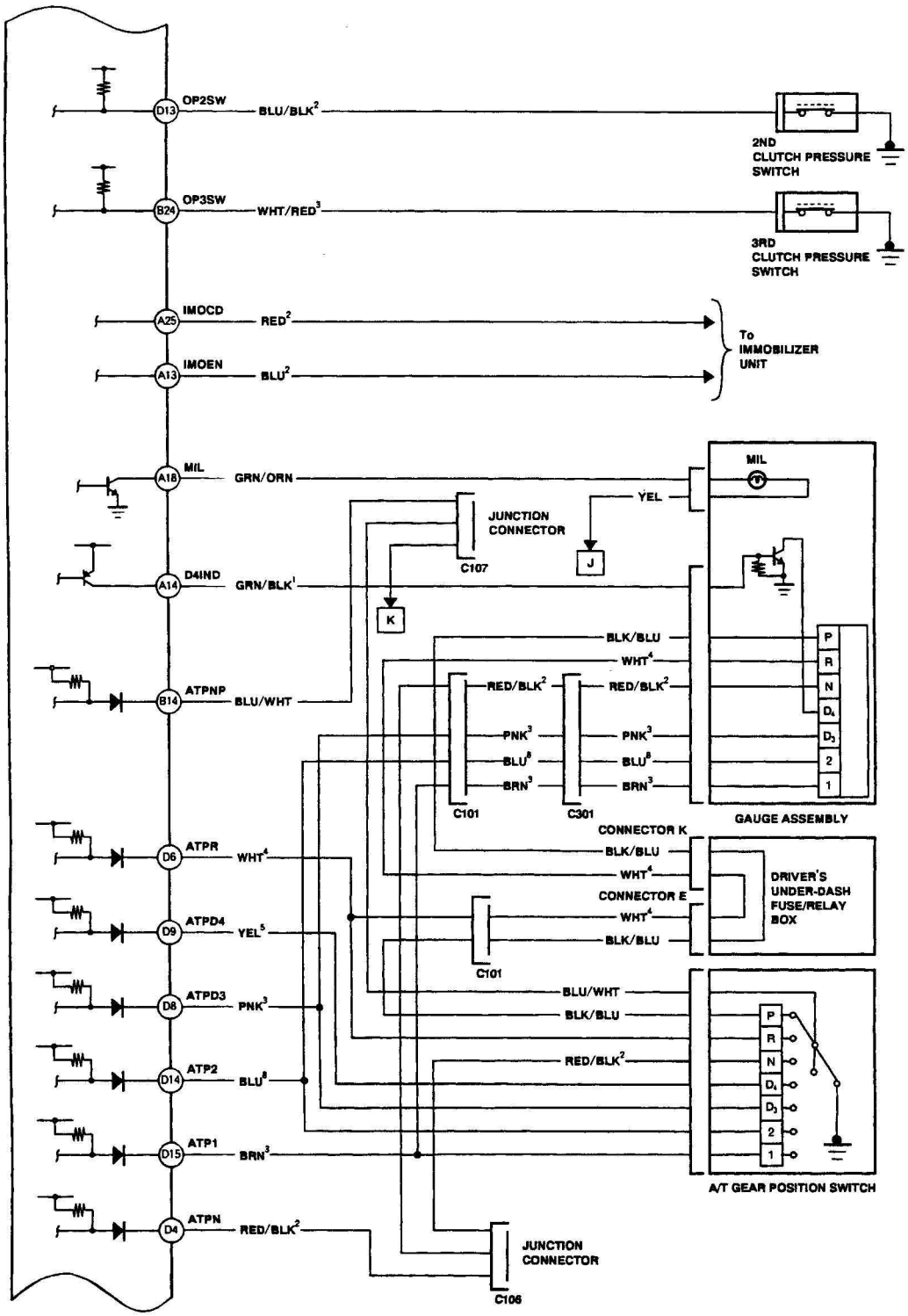
System Descriptions (cont'd)

PCM Circuit Diagram — '99 Model (cont'd)



BACK

Protected by AR



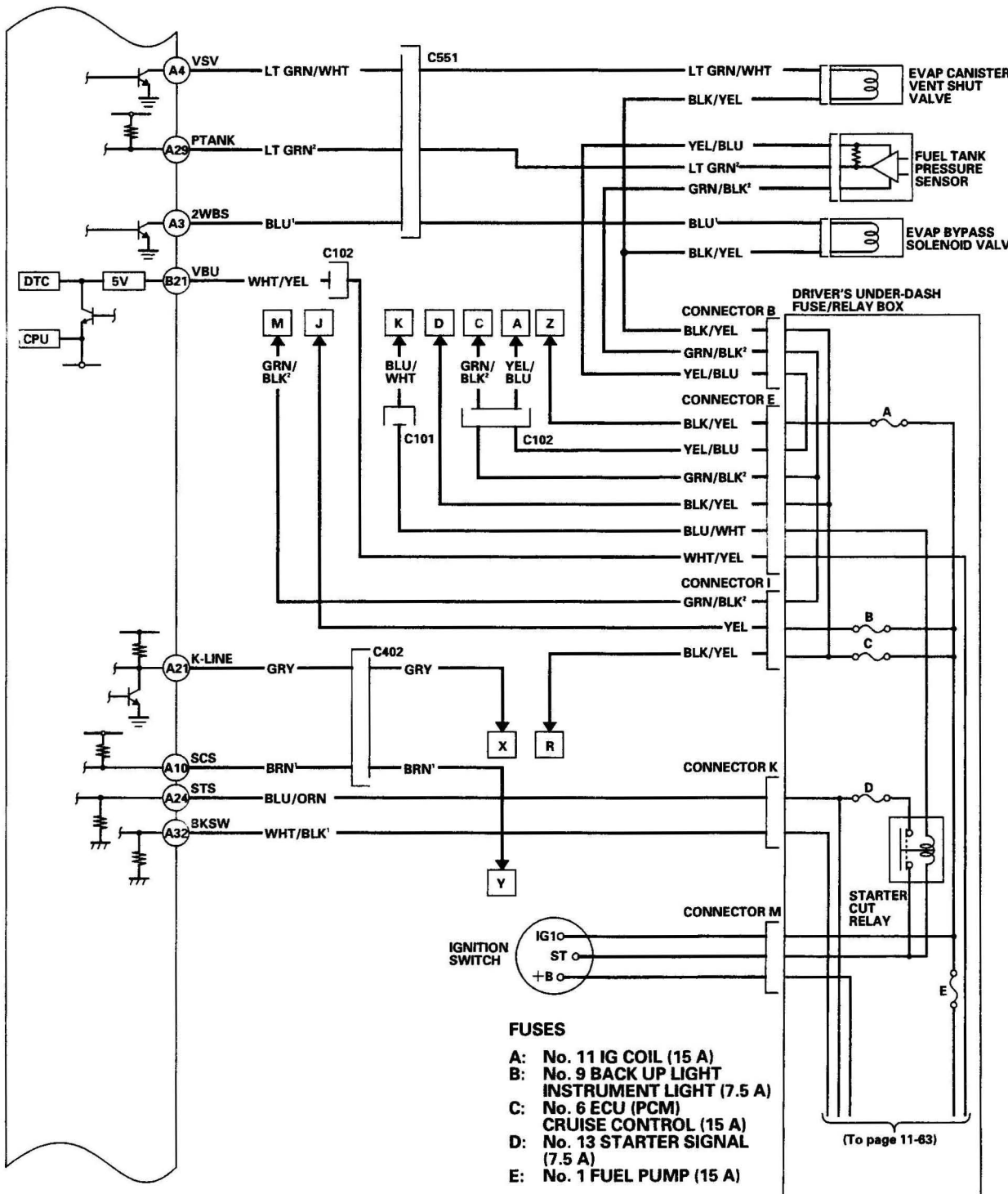
(cont'd)

BACK

Protected by AR

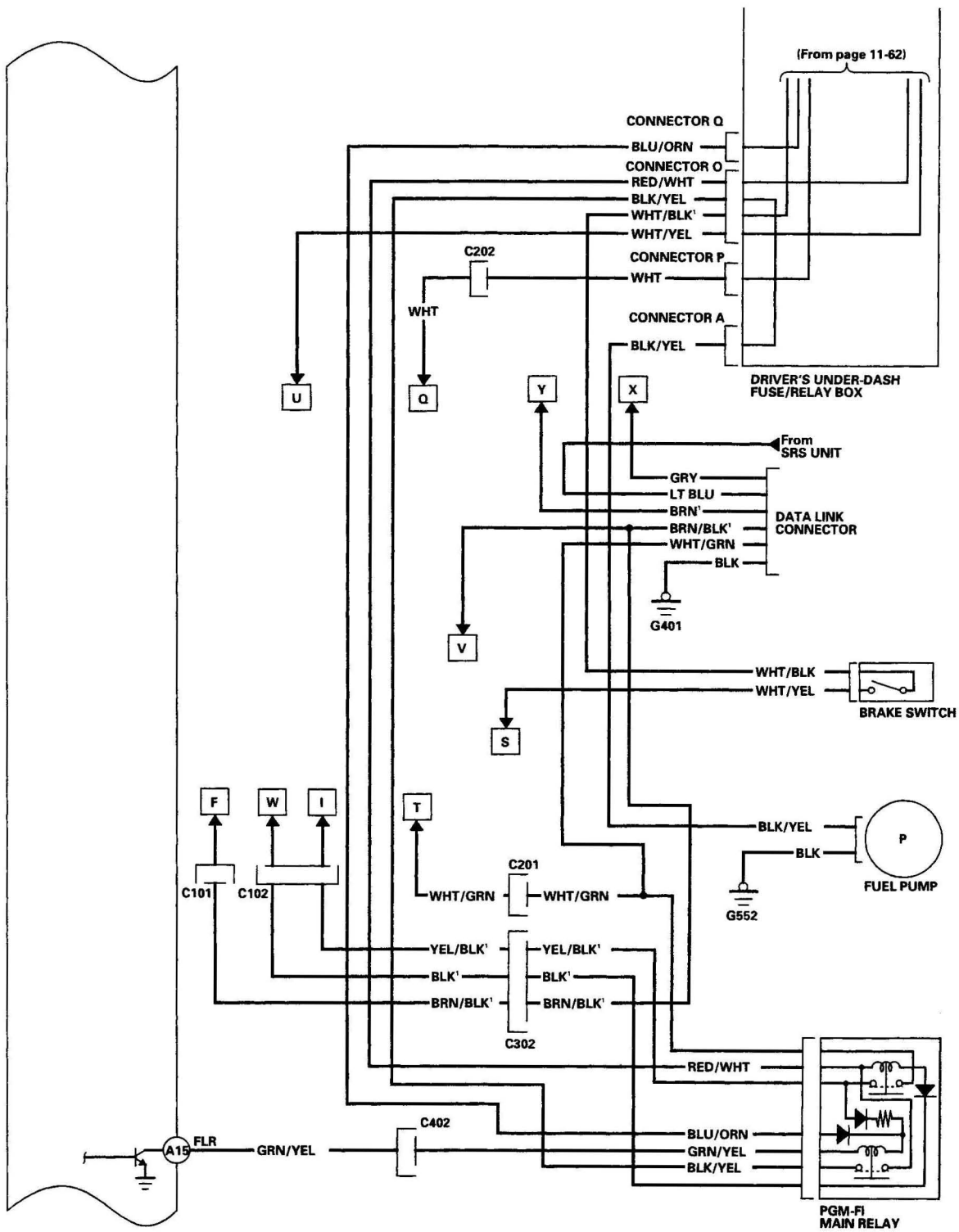
System Descriptions (cont'd)

PCM Circuit Diagram – '99 Model (cont'd)



BACK

Protected by AR



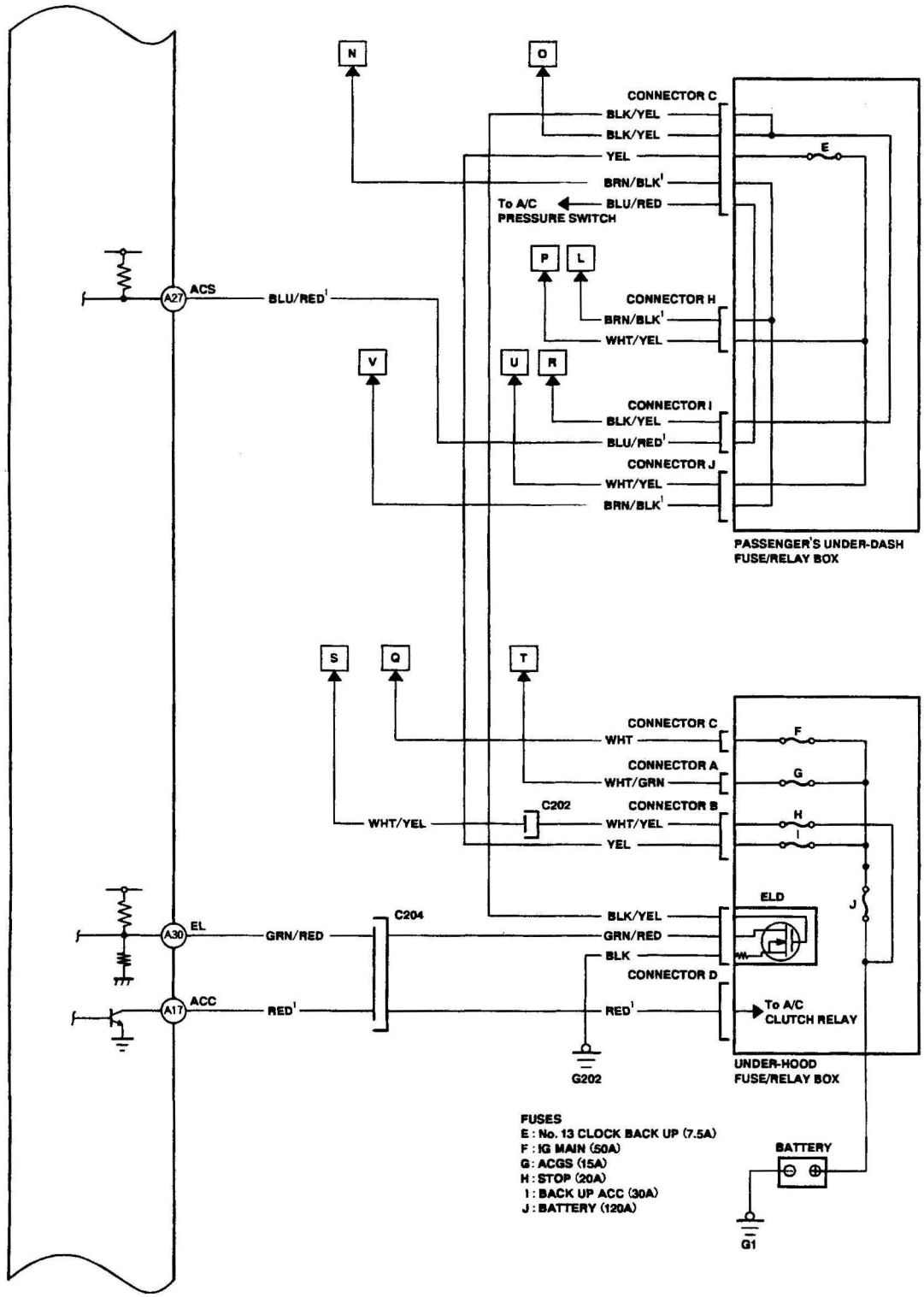
(cont'd)

BACK

Protected by AR

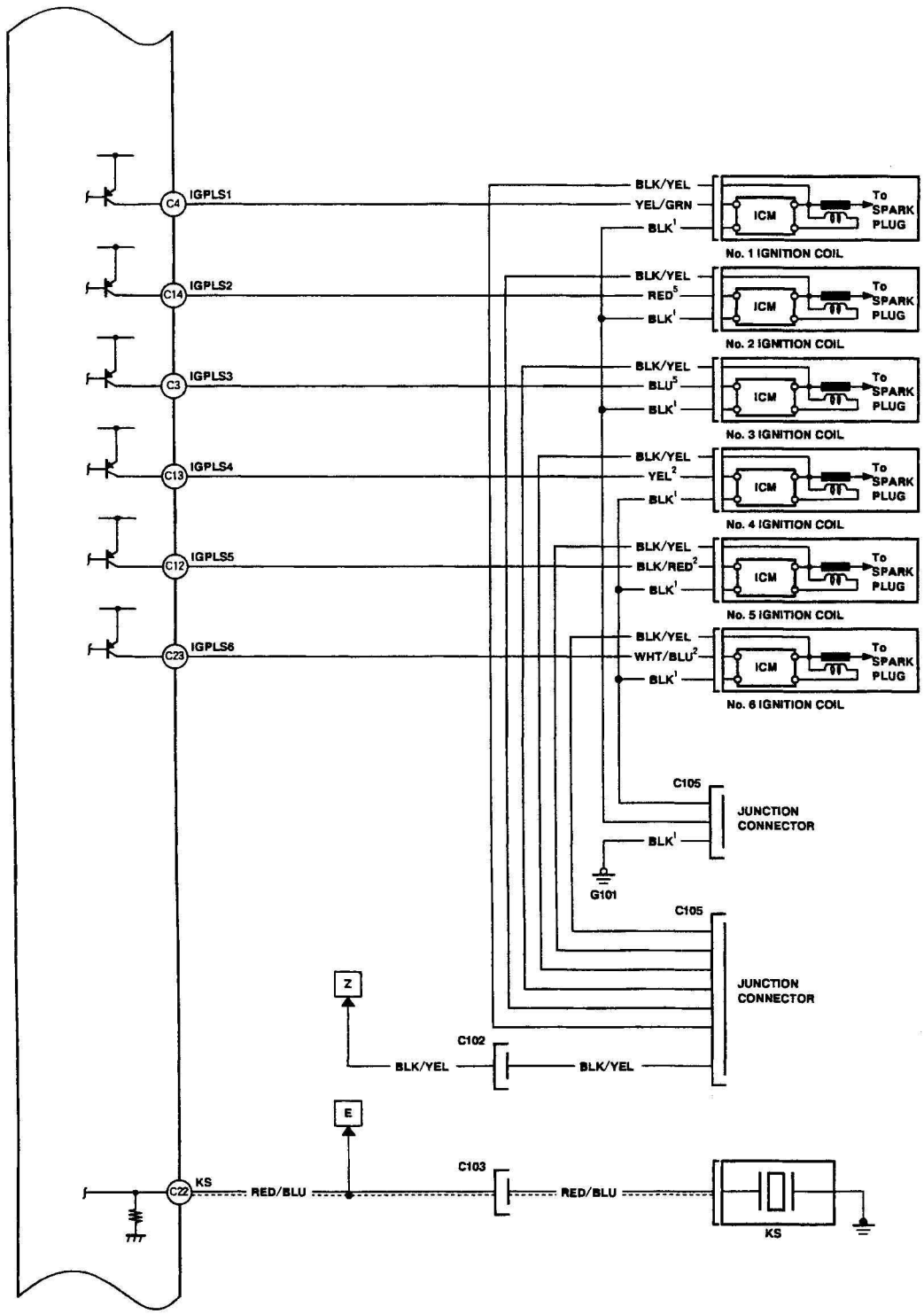
System Descriptions (cont'd)

PCM Circuit Diagram — '99 Model (cont'd)



BACK

Protected by AR



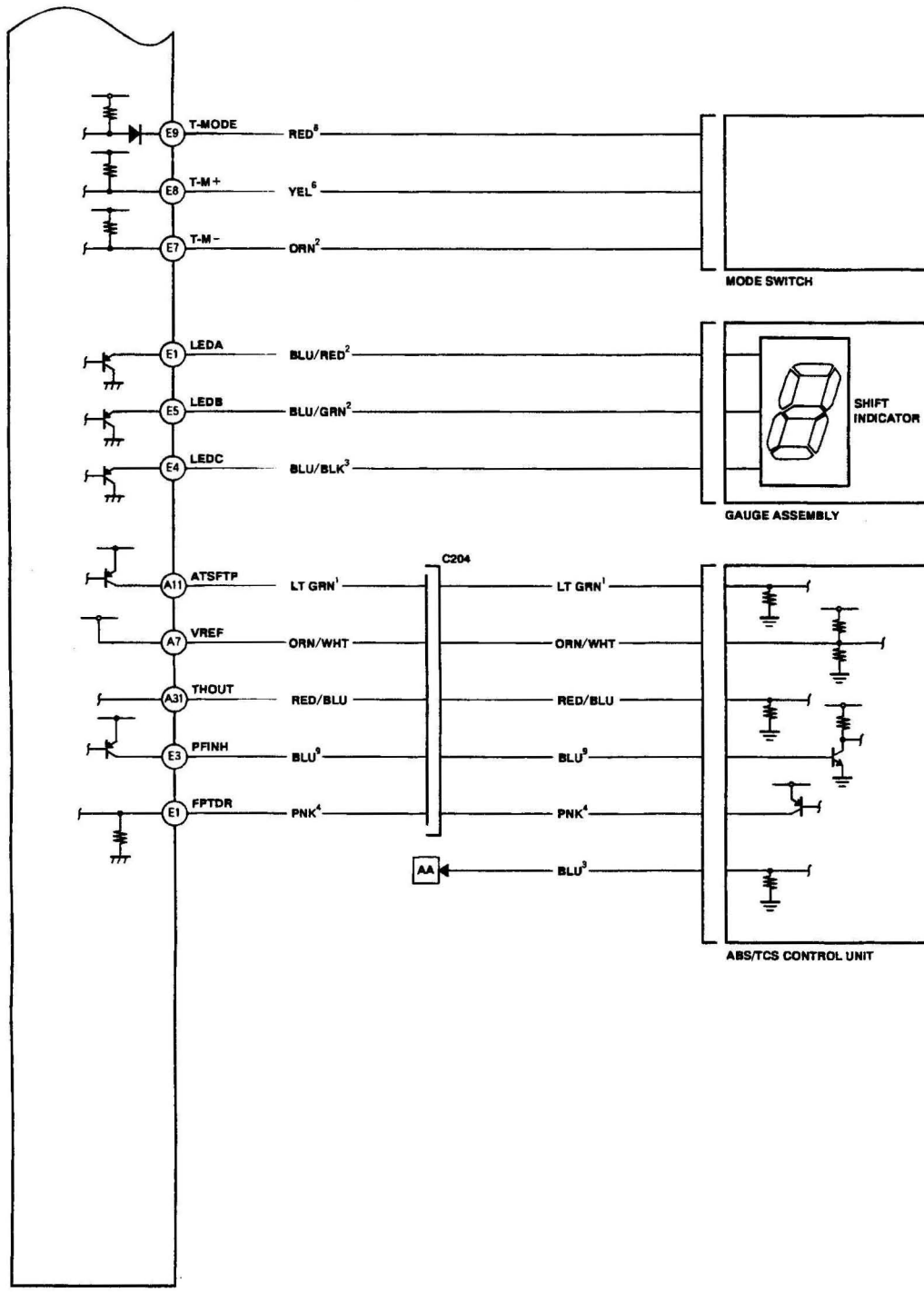
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

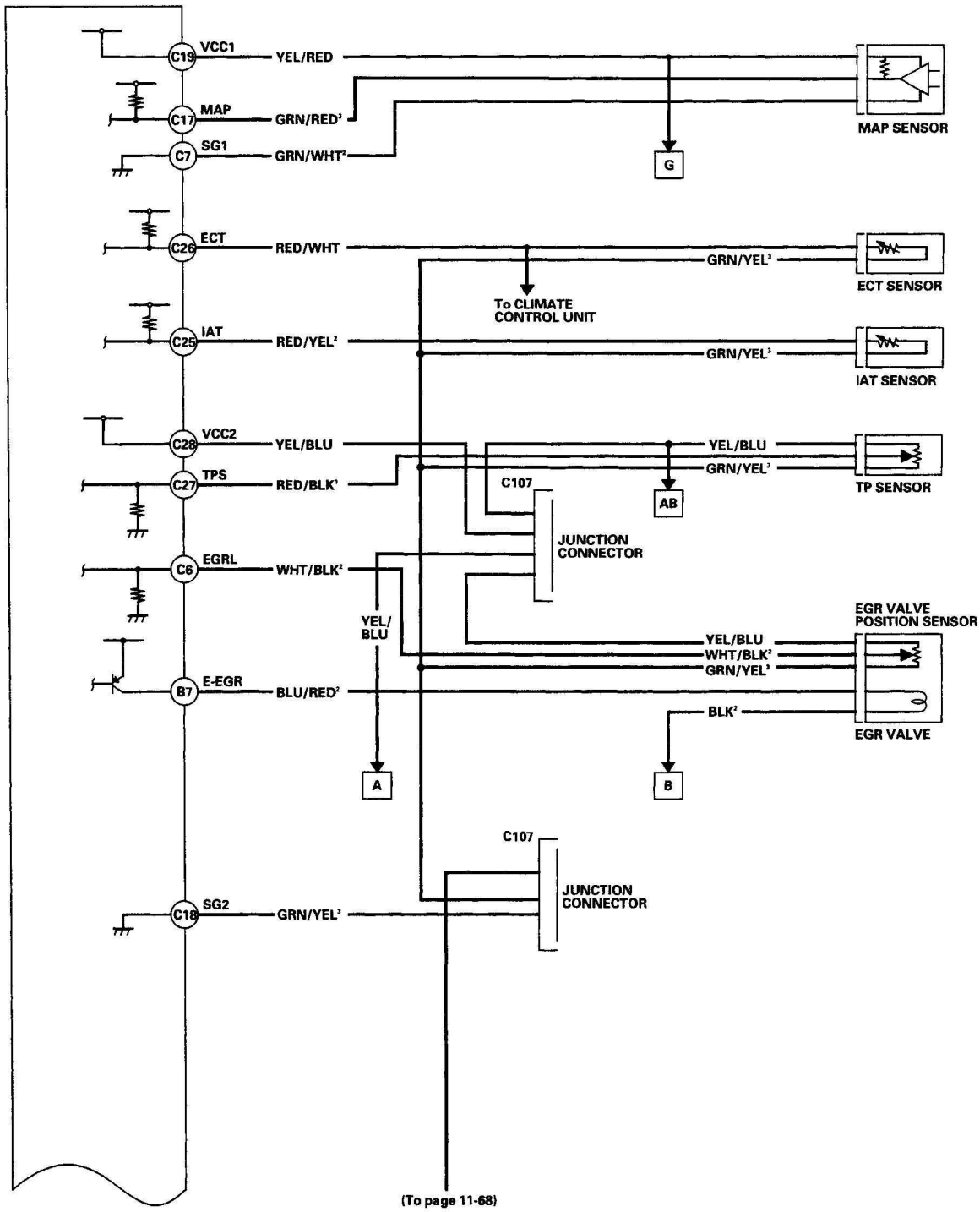
PCM Circuit Diagram – '99 Model (cont'd)



BACK

Protected by AR

PCM Circuit Diagram — '00-01 Models



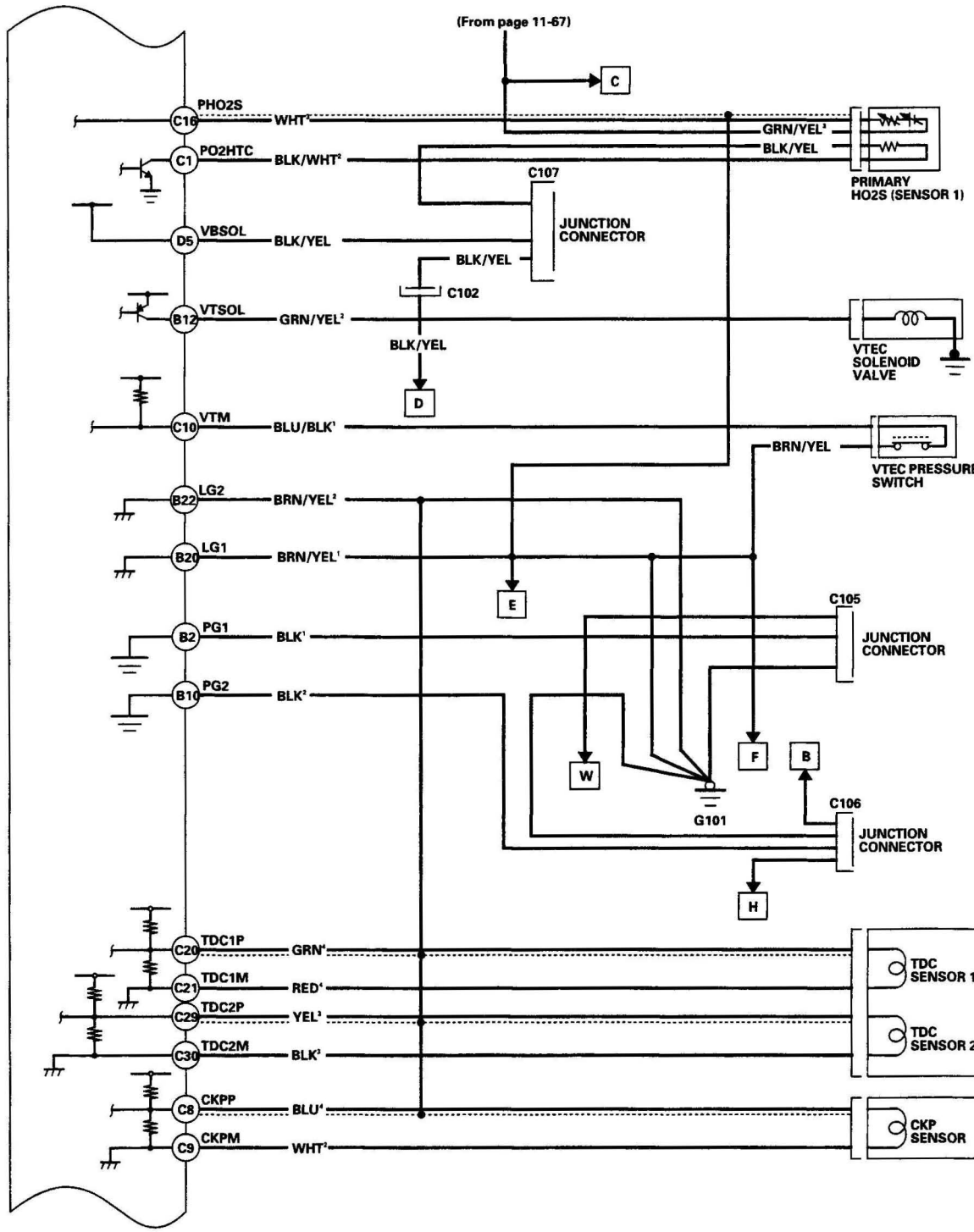
(cont'd)

BACK

Protected by AR

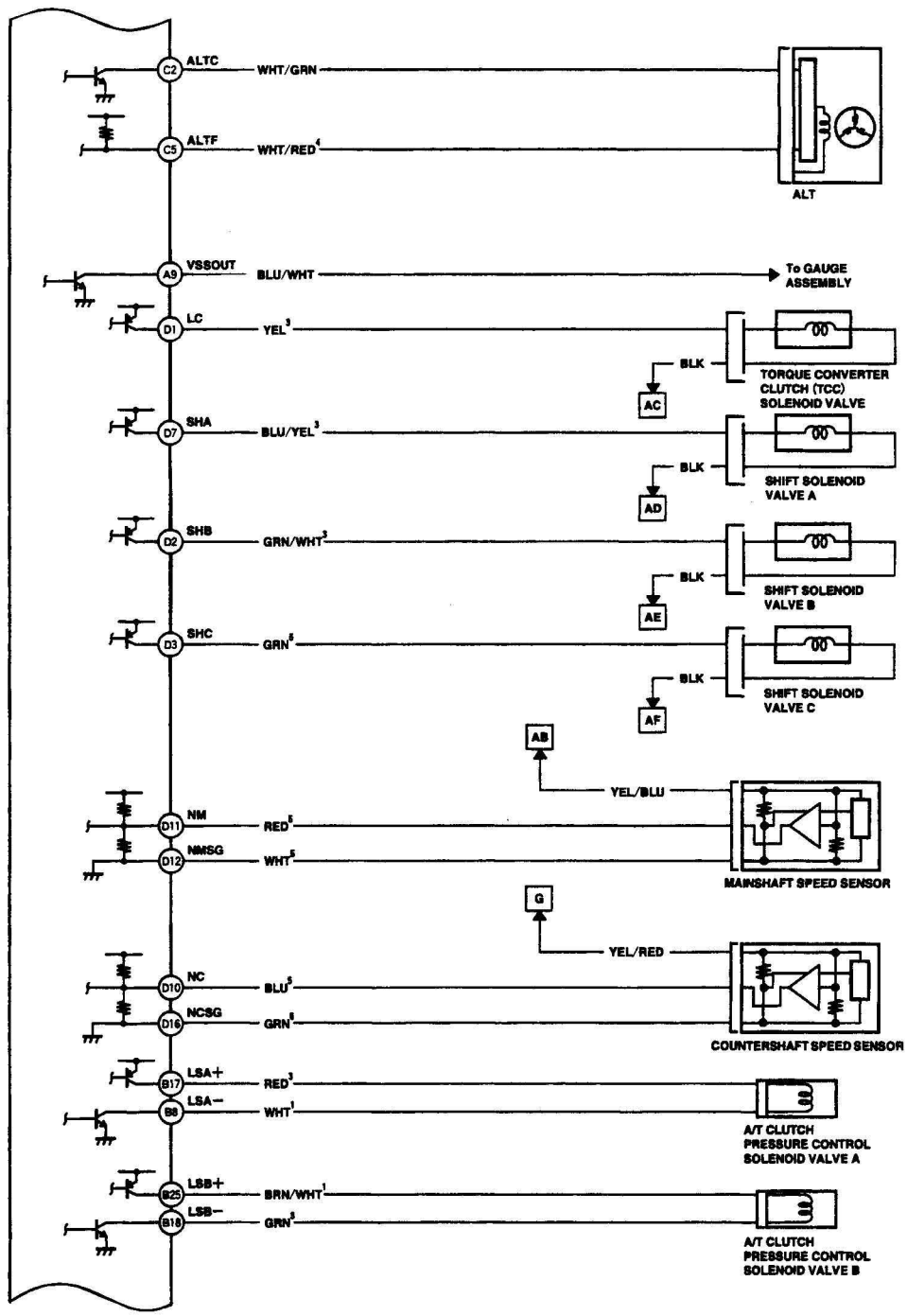
System Descriptions (cont'd)

PCM Circuit Diagram – '00-01 Models (cont'd)



BACK

Protected by AR



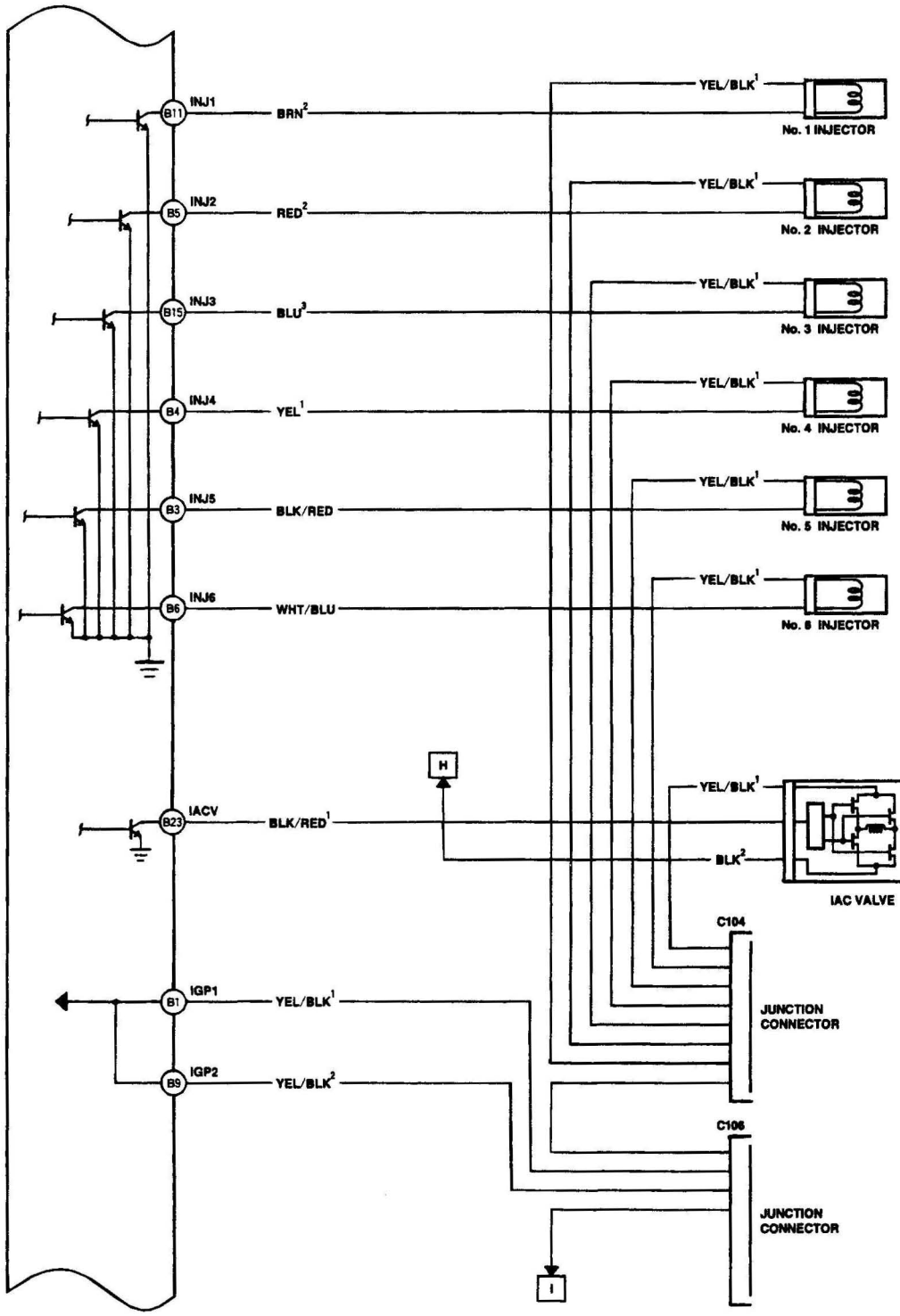
(cont'd)

BACK

Protected by AR

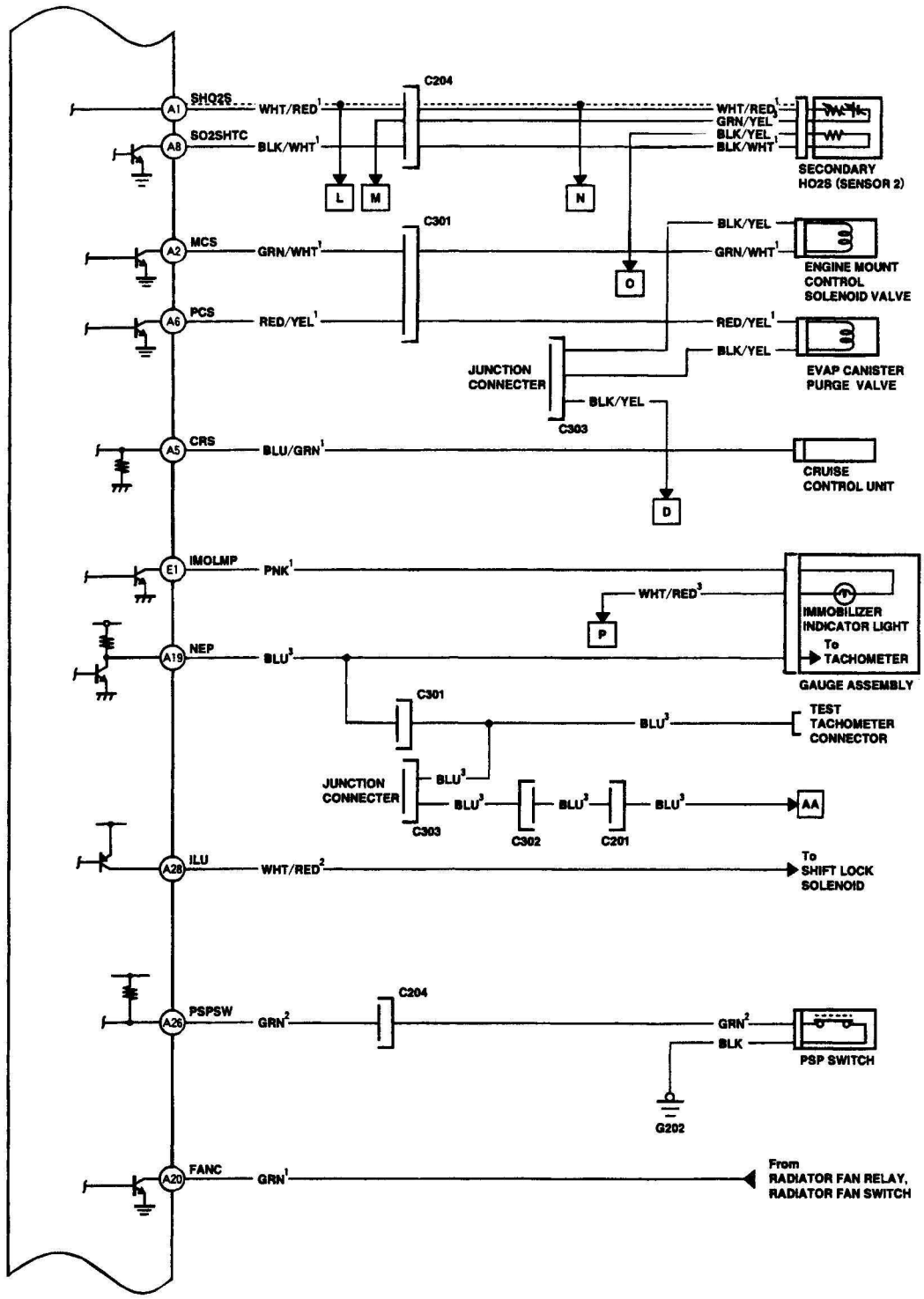
System Descriptions (cont'd)

PCM Circuit Diagram — '00-01 Models (cont'd)



BACK

Protected by AR



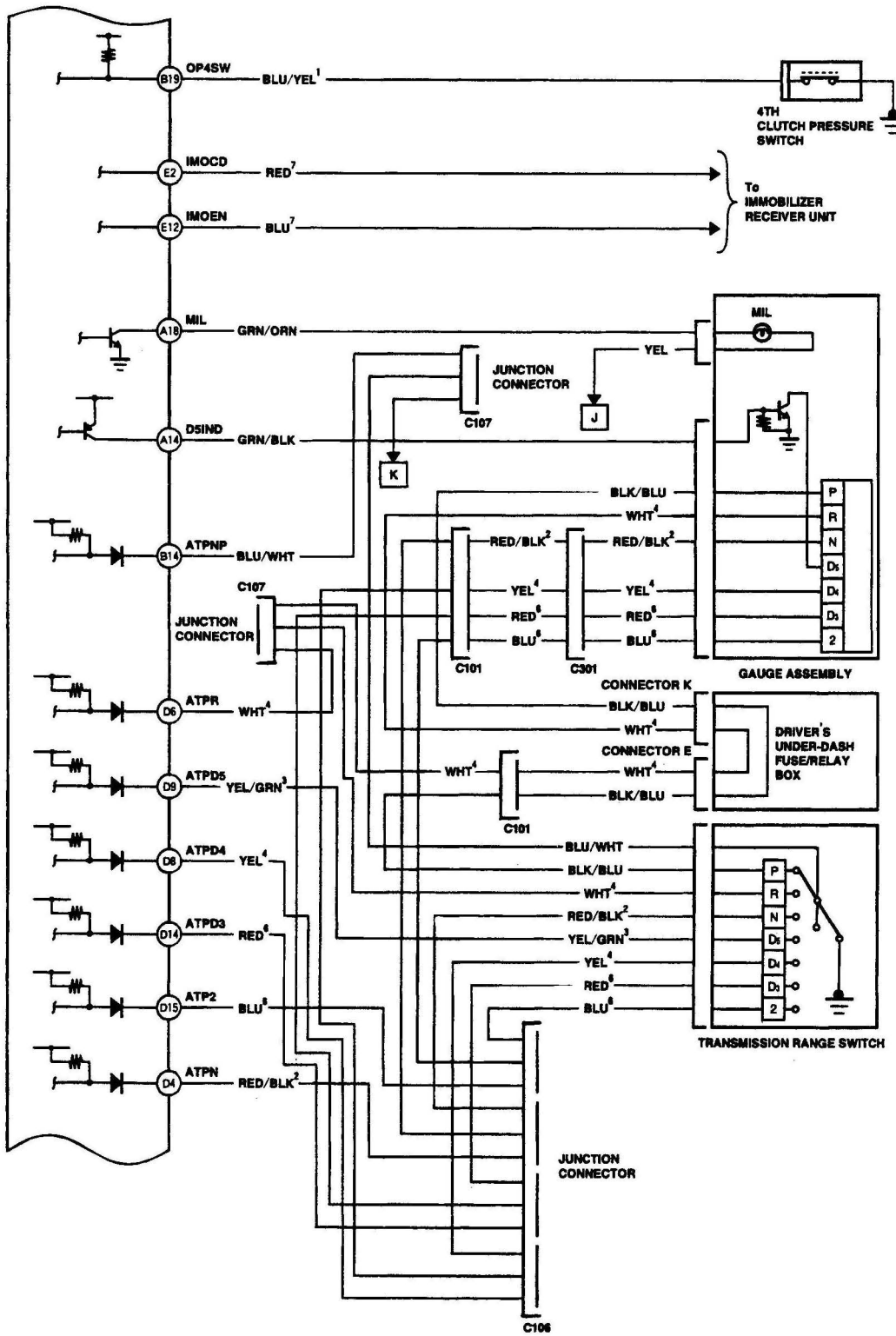
(cont'd)

BACK

Protected by AR

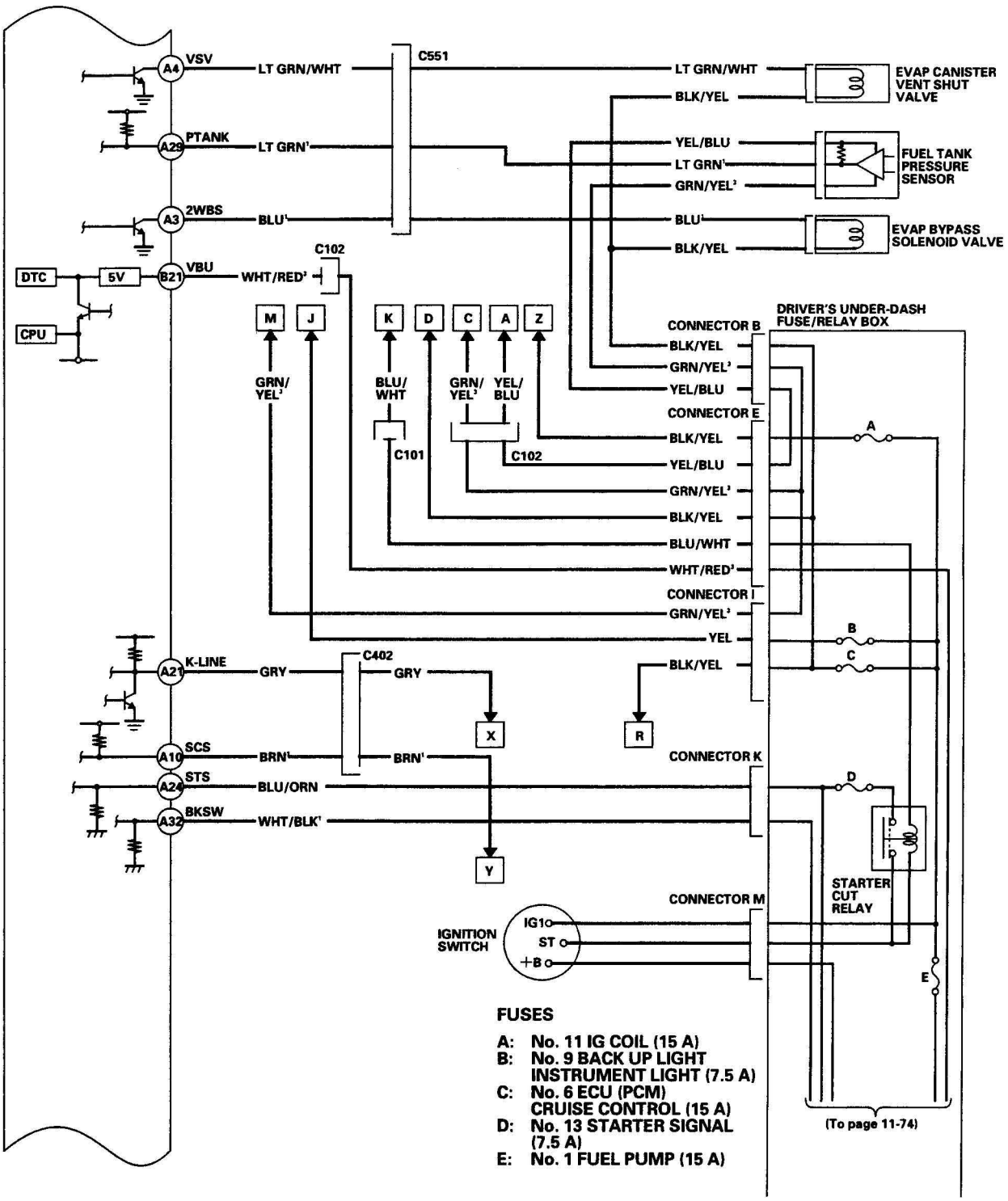
System Descriptions (cont'd)

PCM Circuit Diagram – '00-01 Models (cont'd)



BACK

Protected by AR



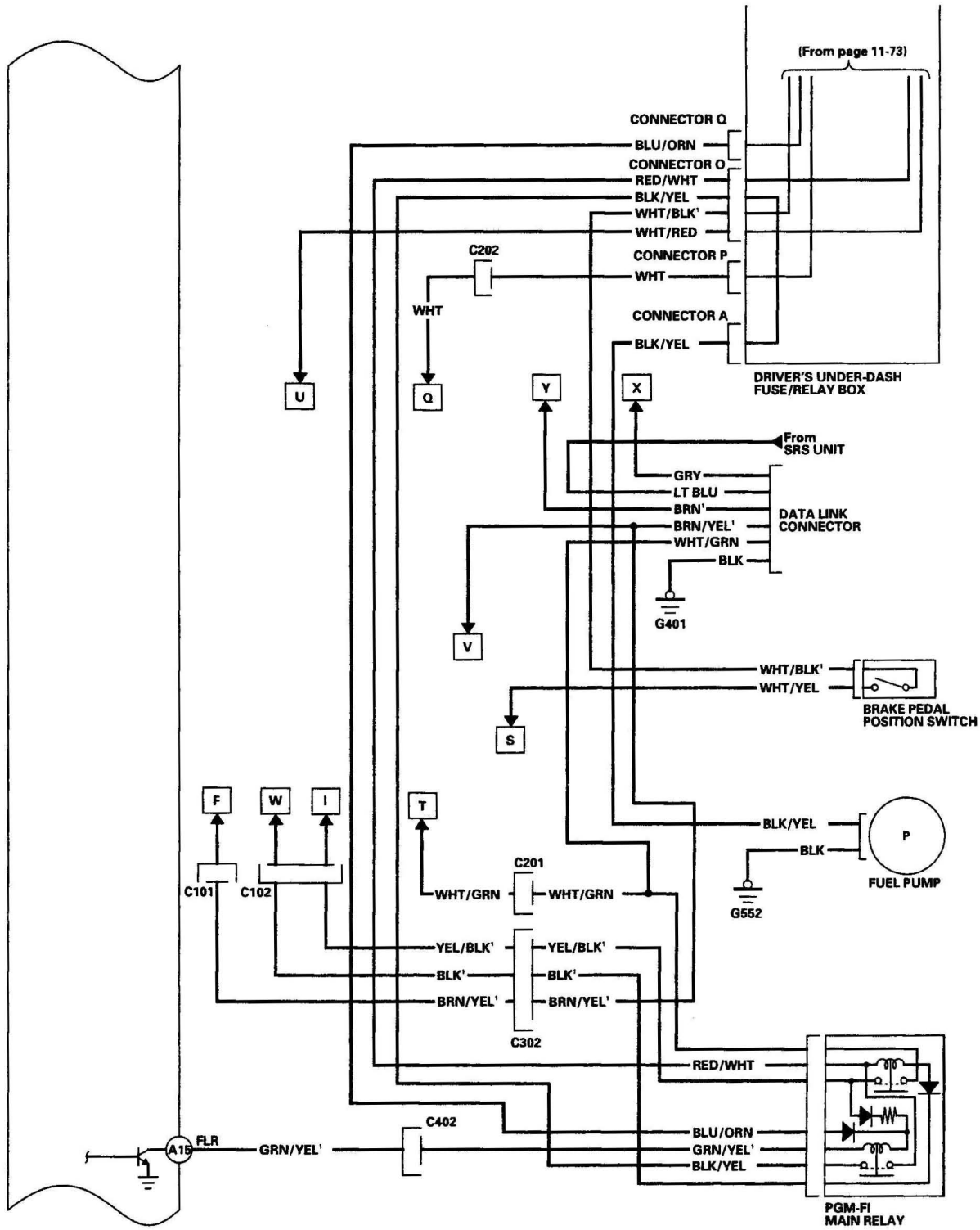
(cont'd)

BACK

Protected by AR

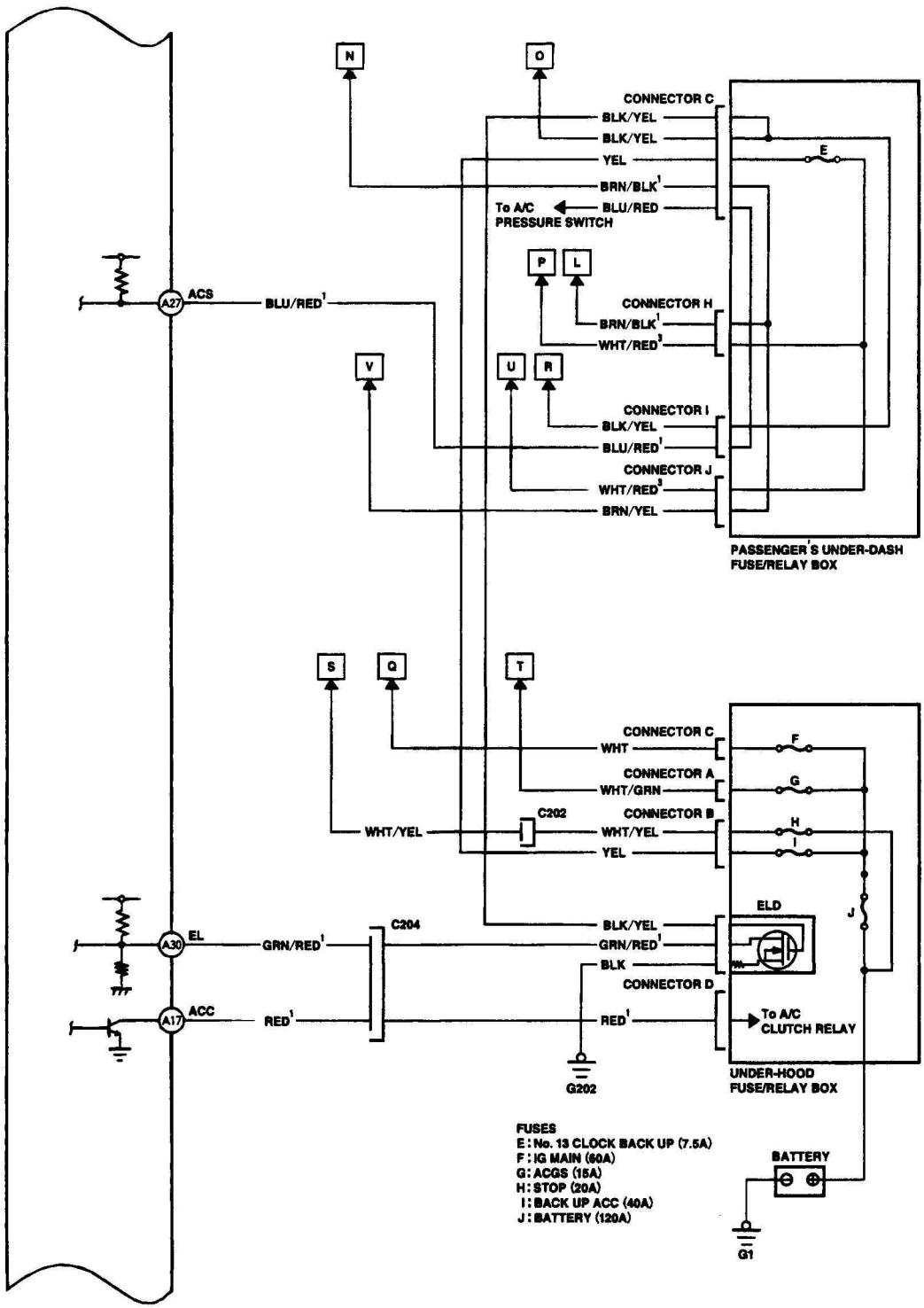
System Descriptions (cont'd)

PCM Circuit Diagram – '00-01 Models (cont'd)



BACK

Protected by AR



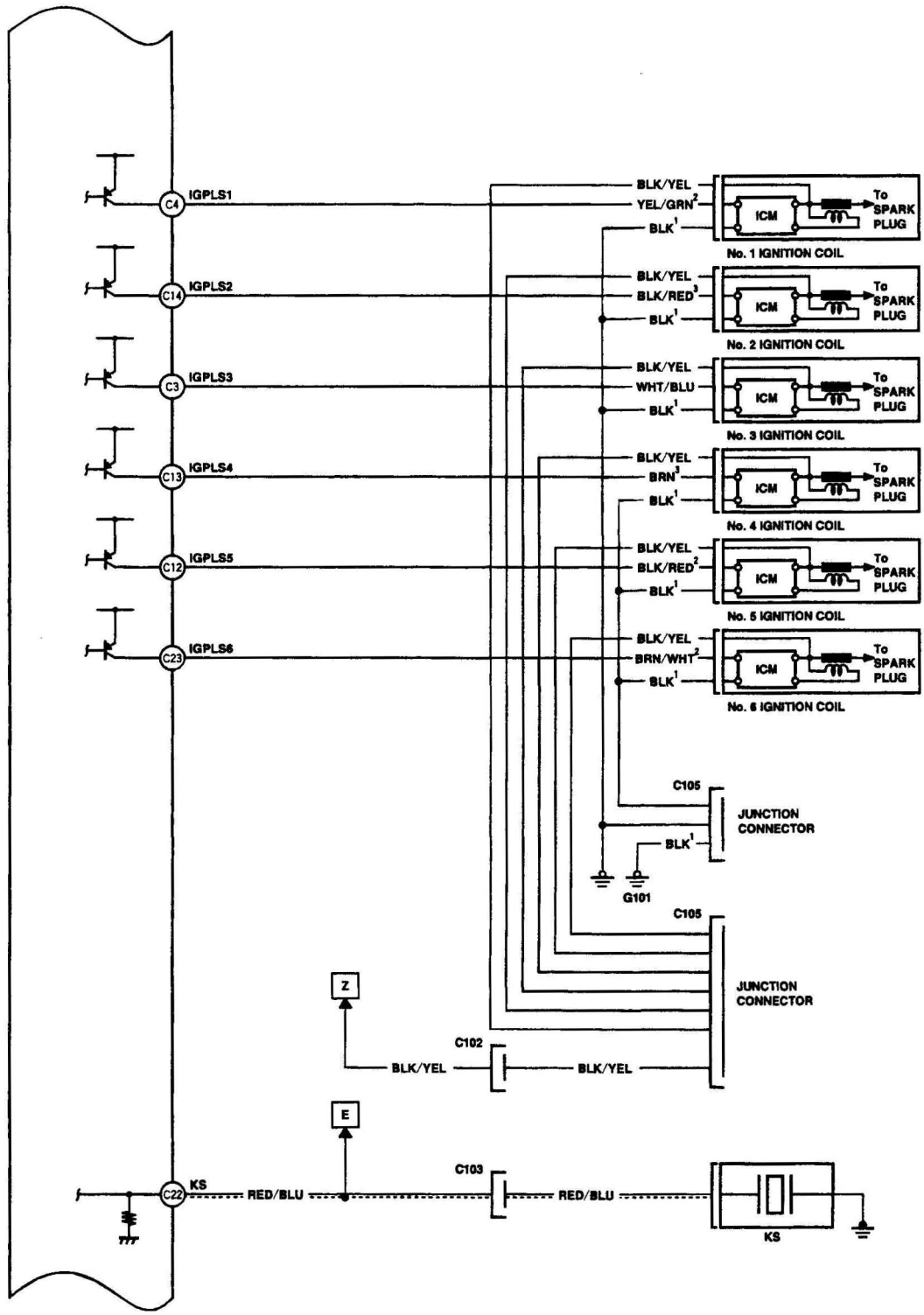
(cont'd)

BACK

Protected by AR

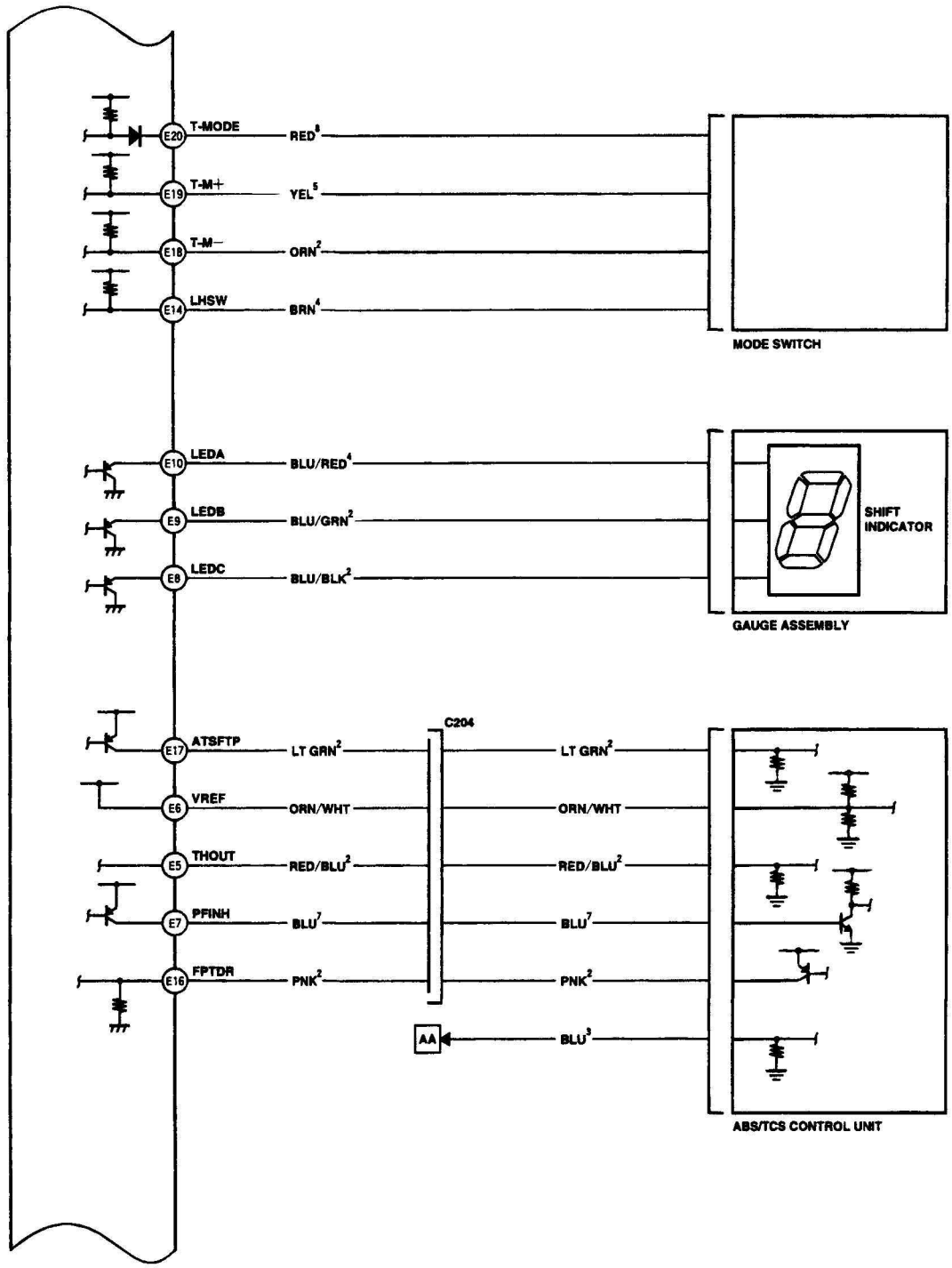
System Descriptions (cont'd)

PCM Circuit Diagram — '00-01 Models (cont'd)



BACK

Protected by AR



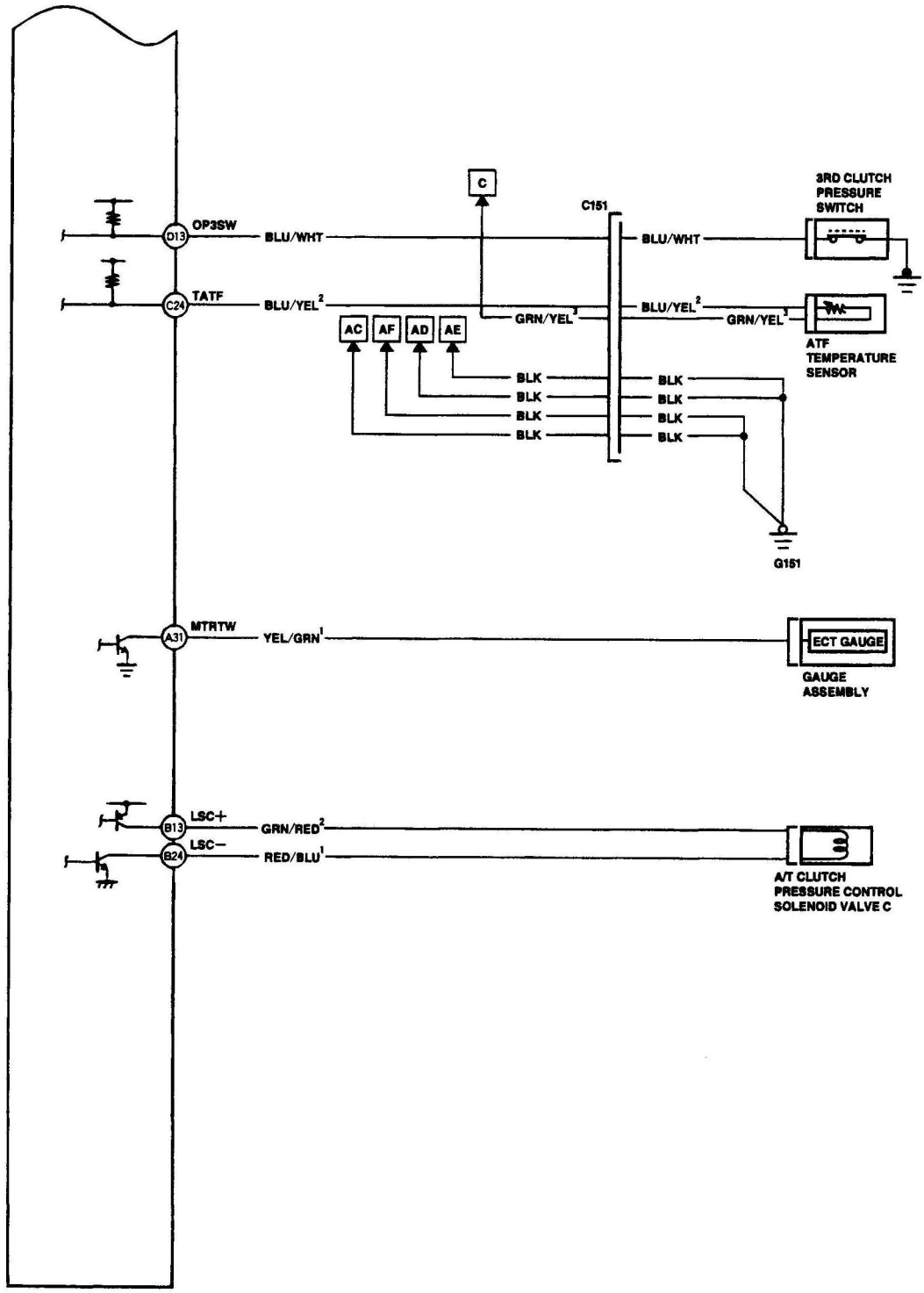
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

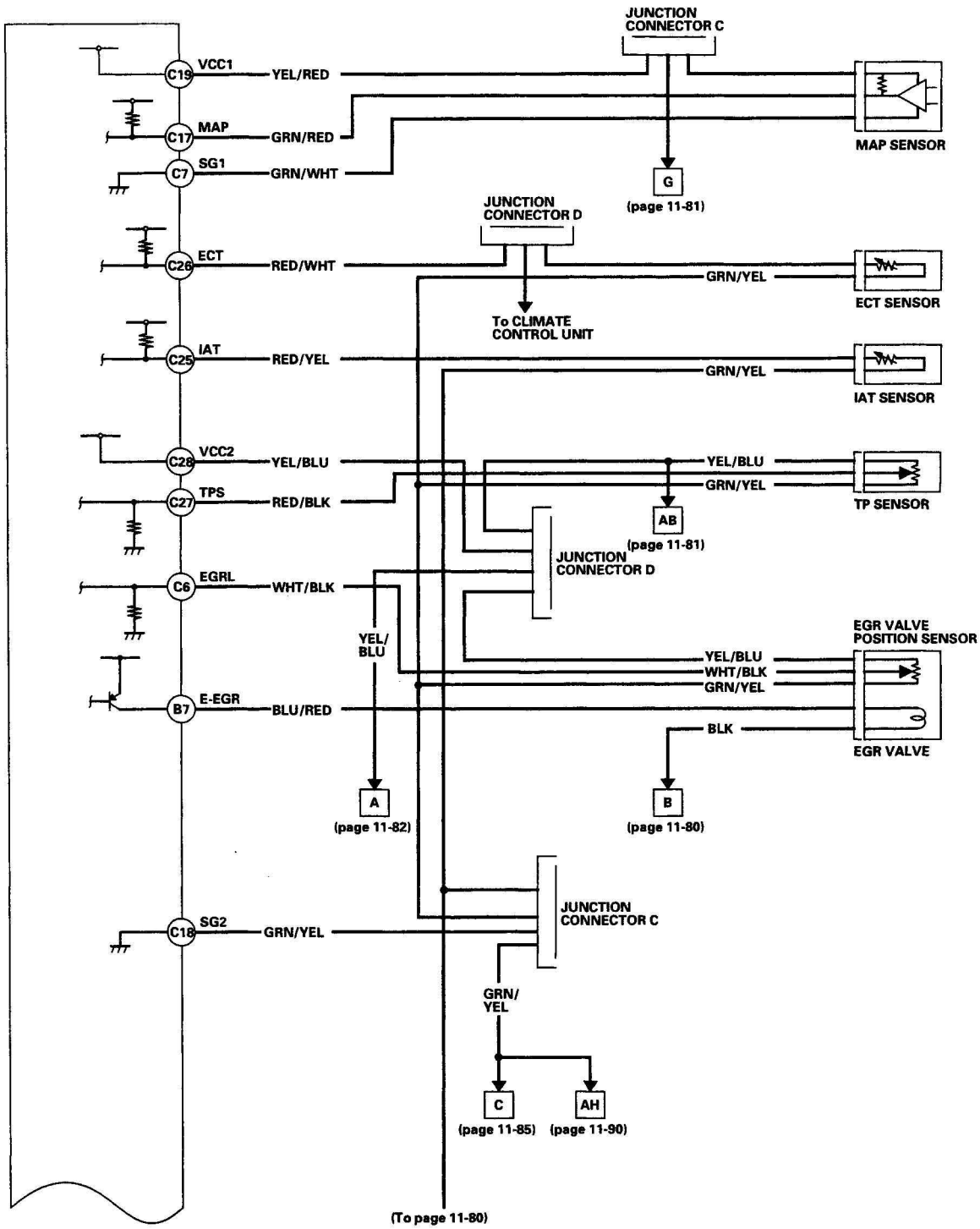
PCM Circuit Diagram – '00-01 Models (cont'd)



BACK

Protected by AR

PCM Circuit Diagram – '02-03 Models

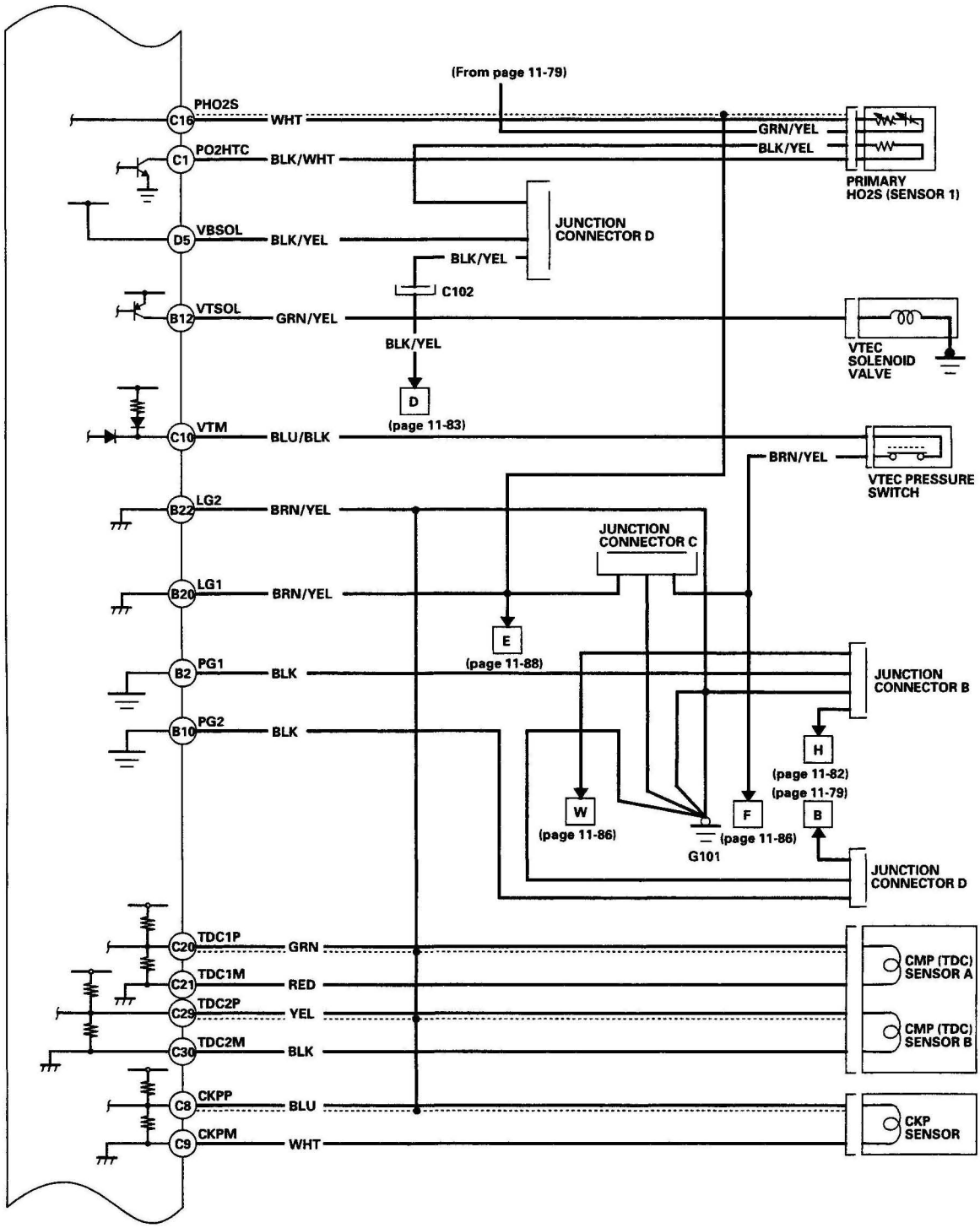


(cont'd)

Protected by AR

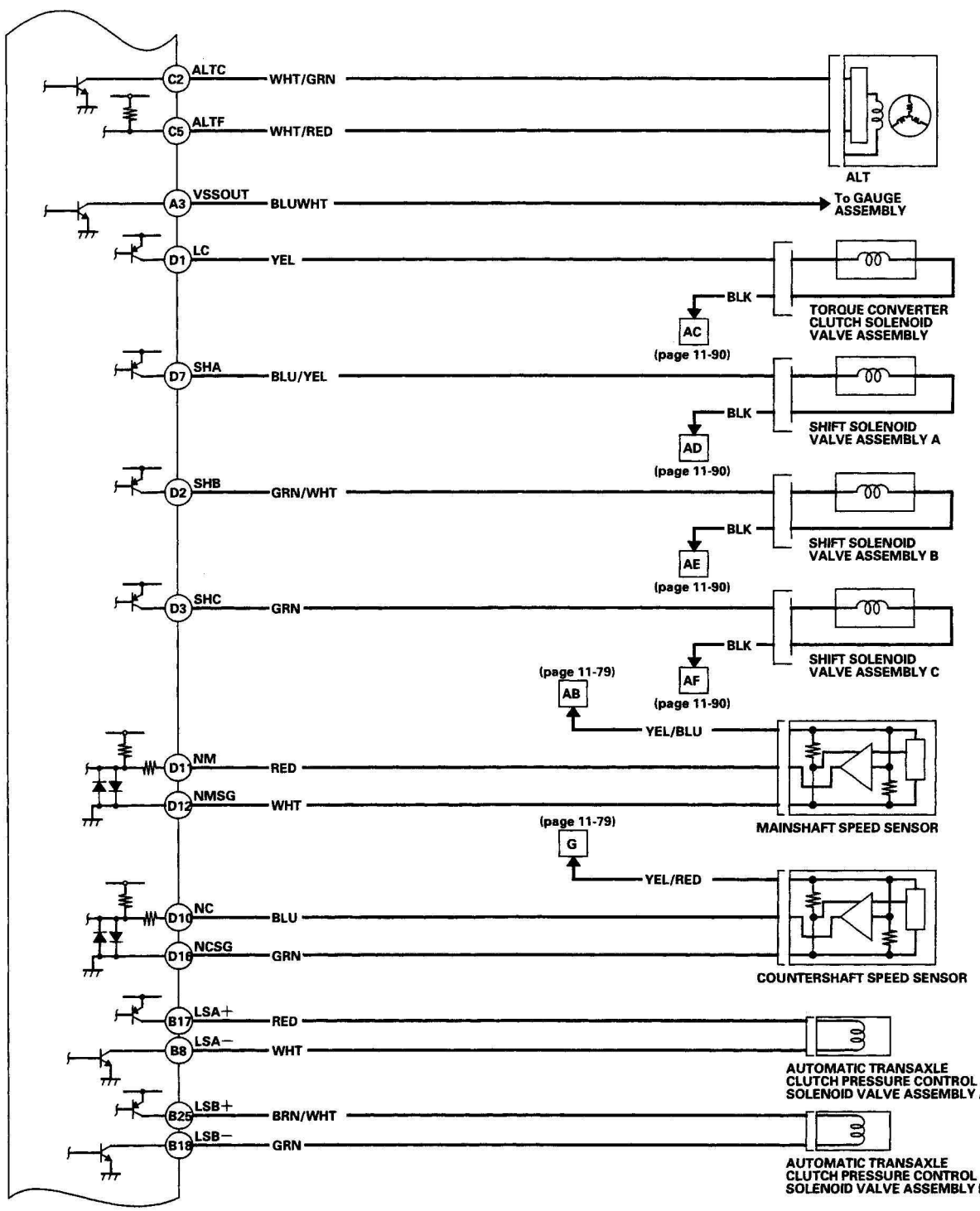
System Descriptions (cont'd)

PCM Circuit Diagram – '02-03 Models (cont'd)



BACK

Protected by AR



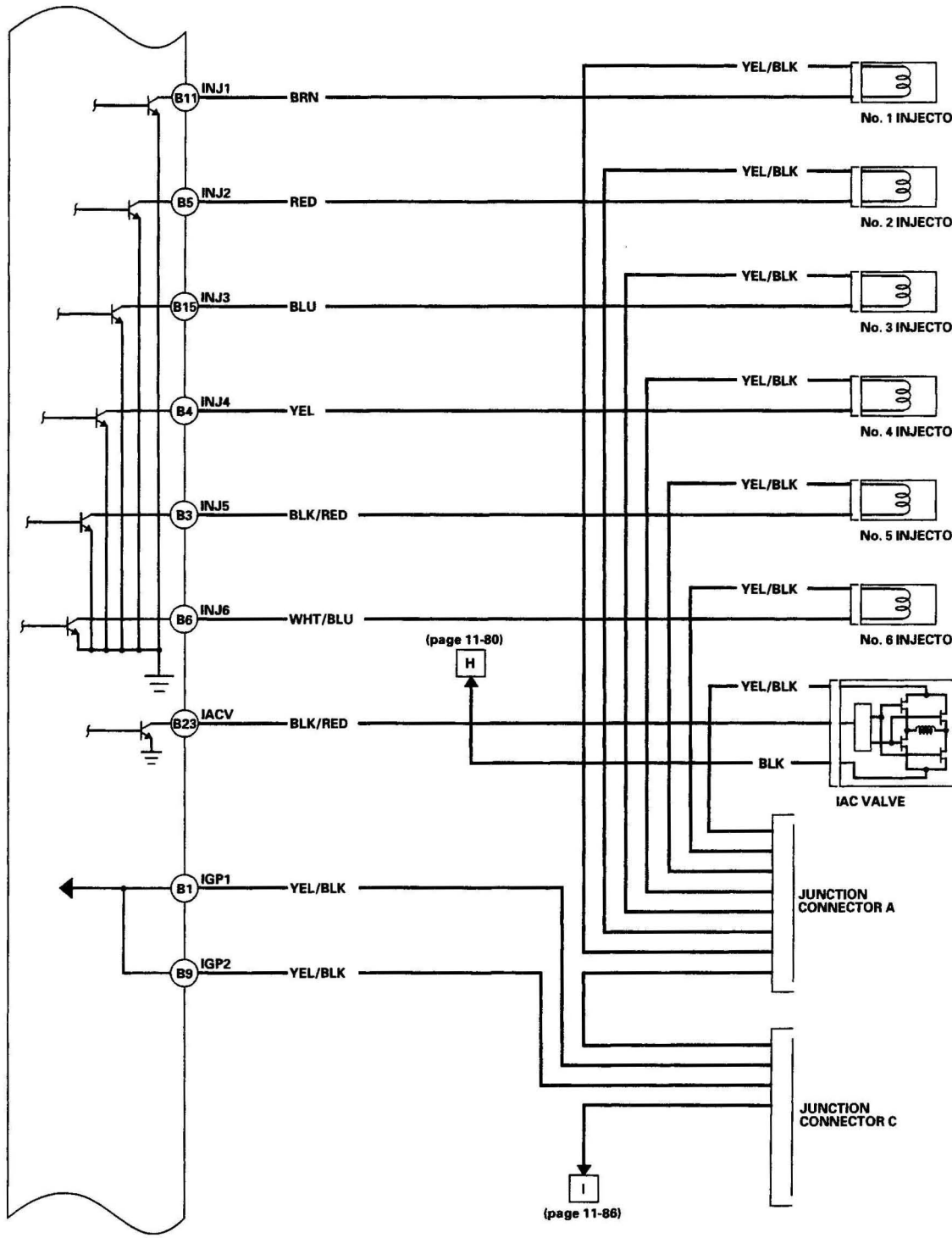
(cont'd)

BACK

Protected by AR

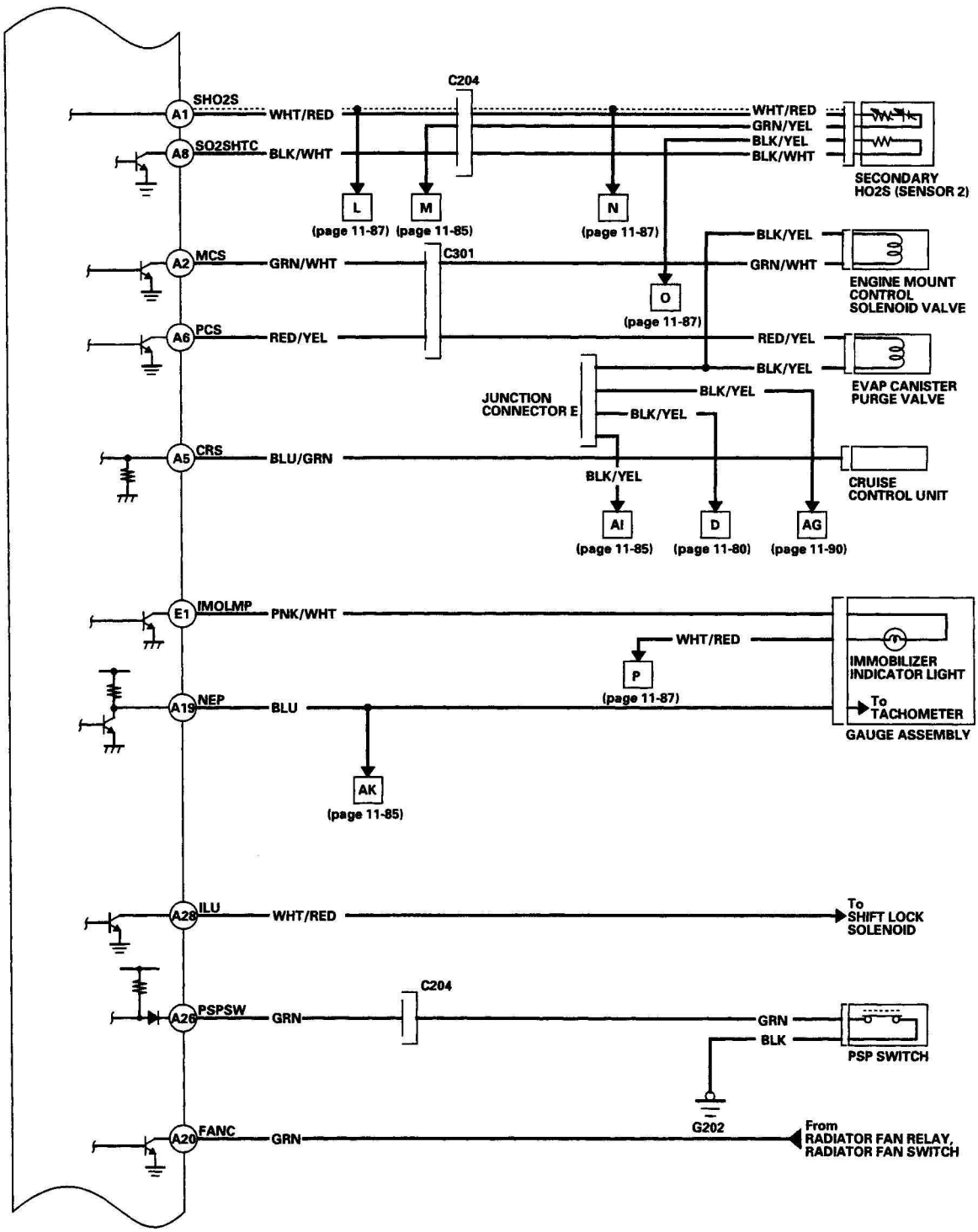
System Descriptions (cont'd)

PCM Circuit Diagram – '02-03 Models (cont'd)



BACK

Protected by AR



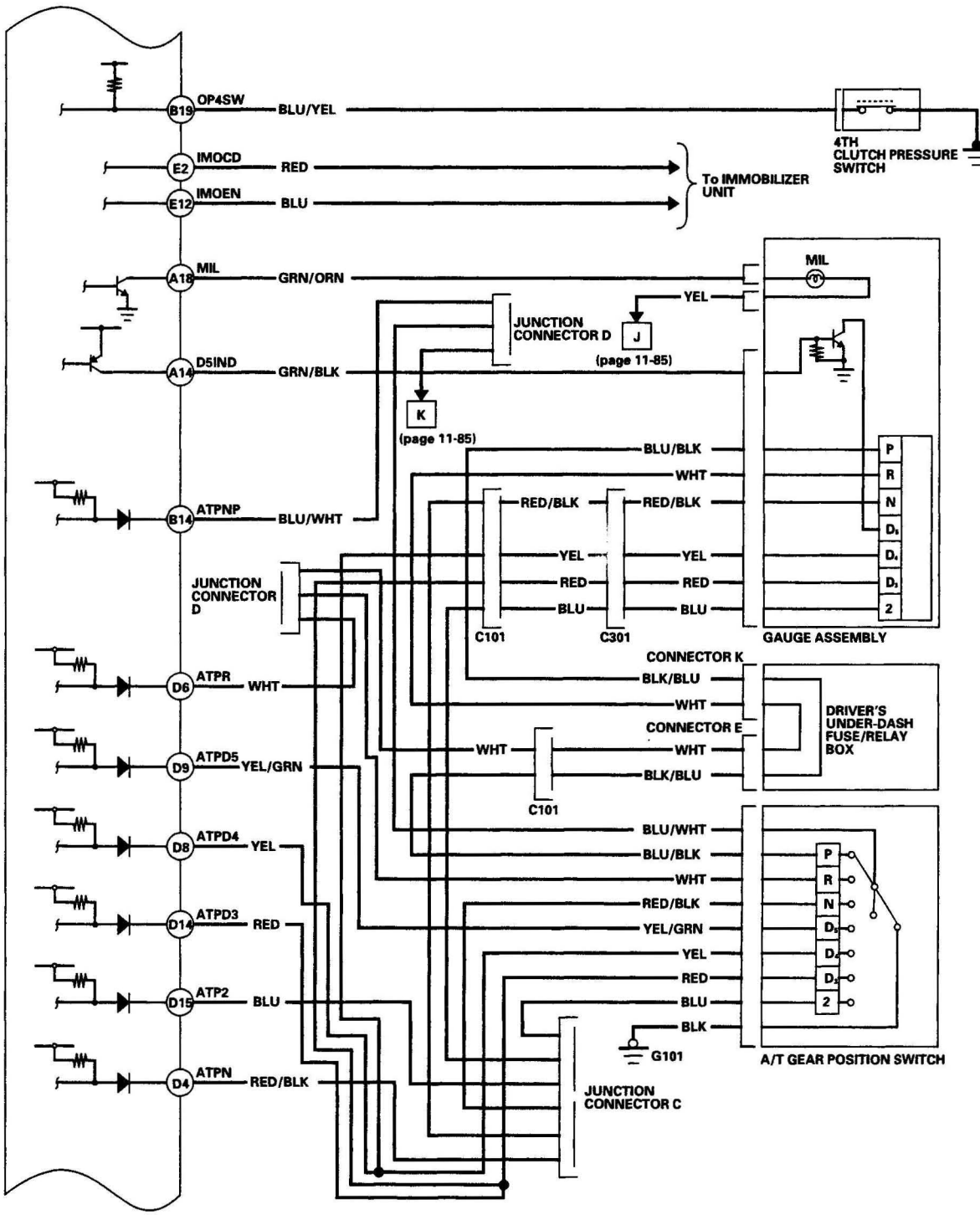
(cont'd)

BACK

Protected by AR

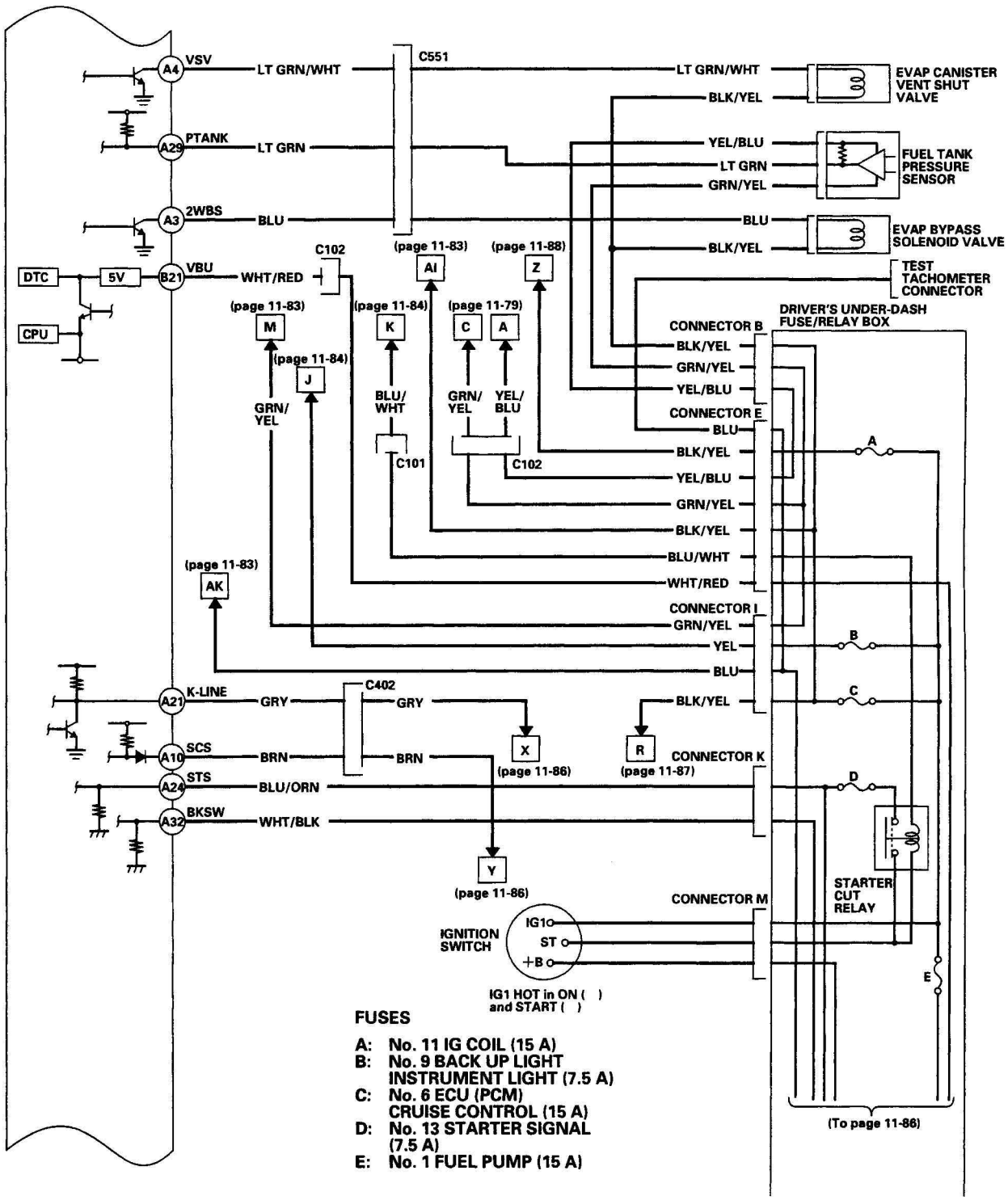
System Descriptions (cont'd)

PCM Circuit Diagram – '02-03 Models (cont'd)



BACK

Protected by AR



FUSES

- **A:** No. 11 IG COIL (15 A)
- **B:** No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A)
- **C:** No. 6 ECU (PCM) CRUISE CONTROL (15 A)
- **D:** No. 13 STARTER SIGNAL (7.5 A)
- **E:** No. 1 FUEL PUMP (15 A)

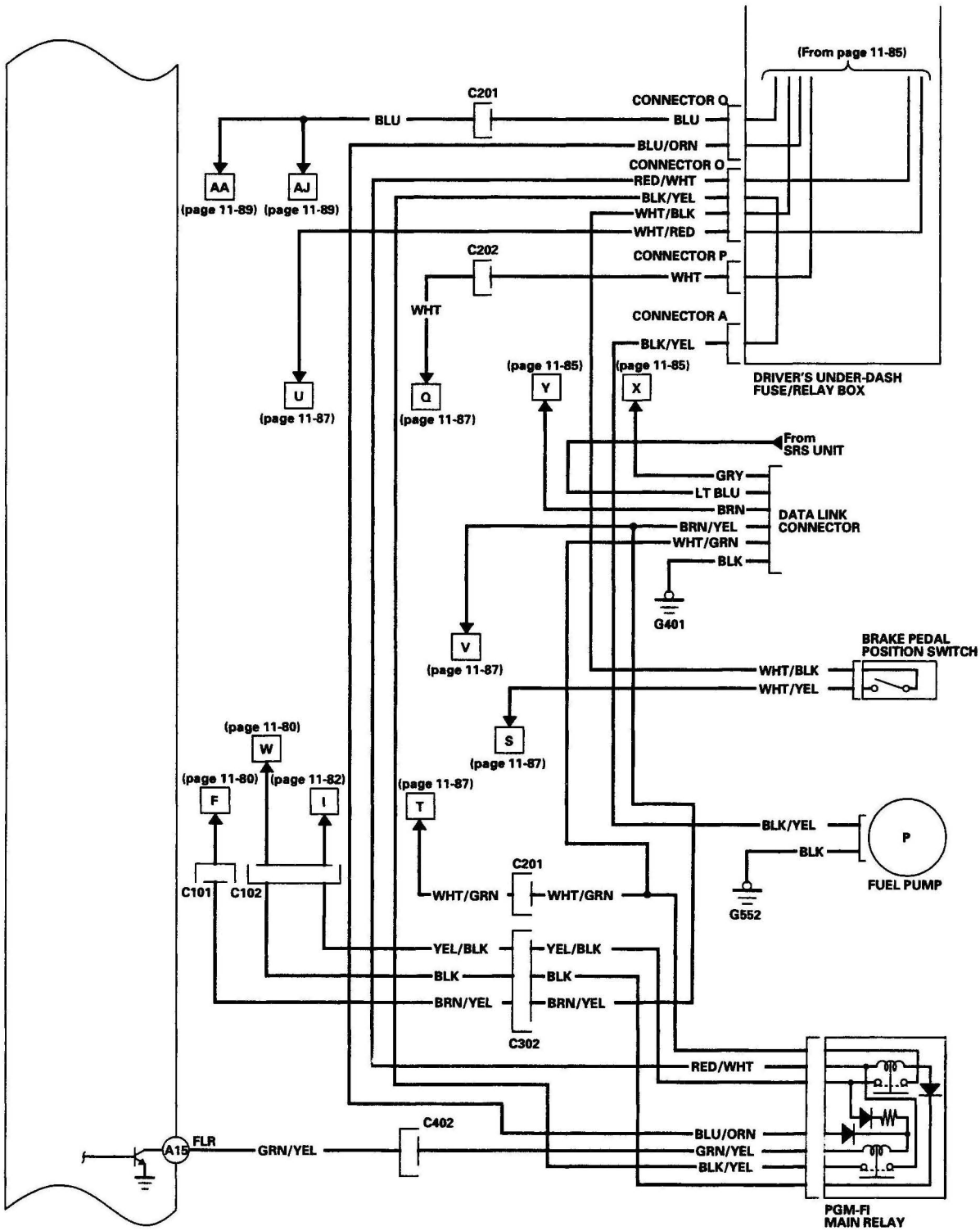
(cont'd)

BACK

Protected by AR

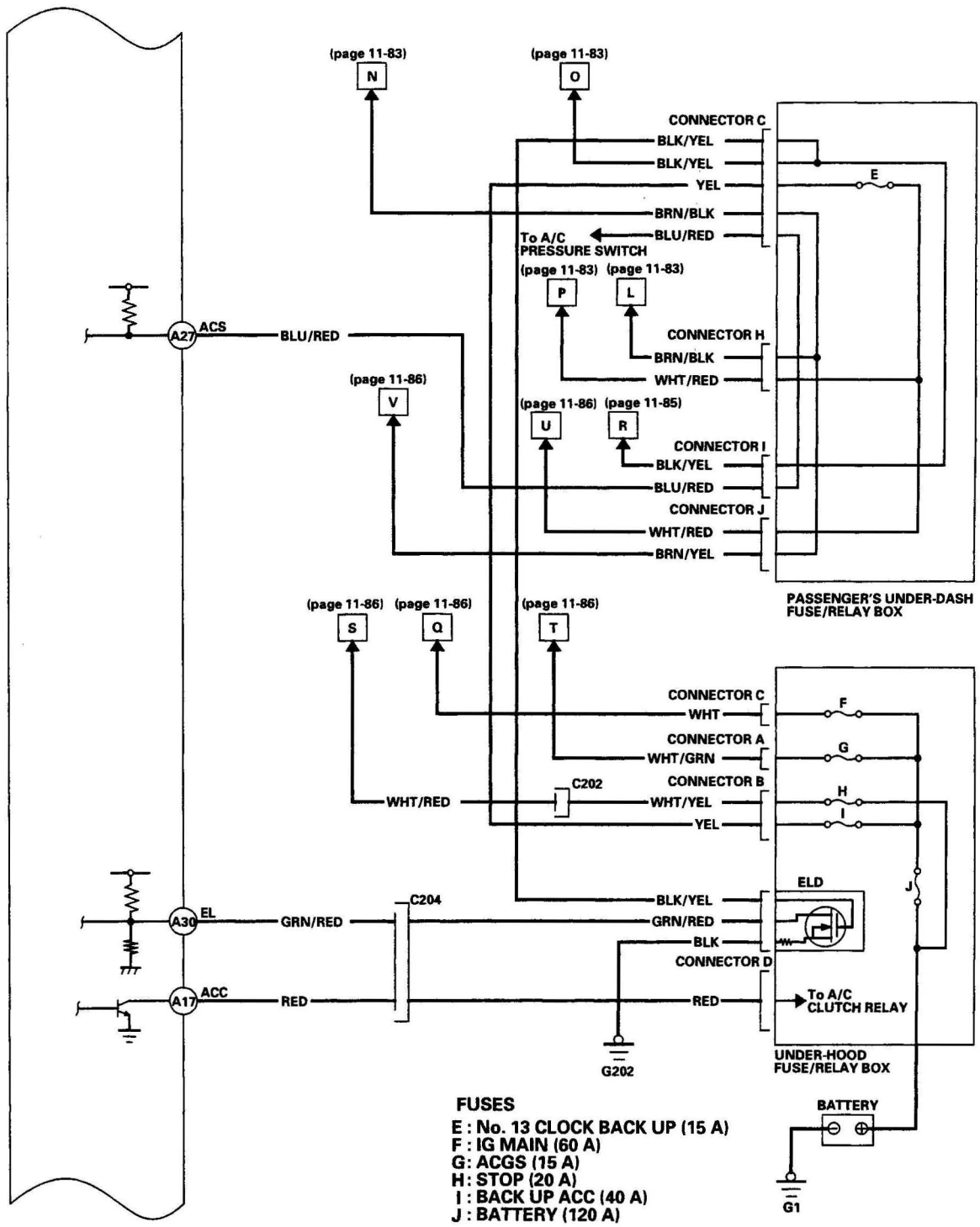
System Descriptions (cont'd)

PCM Circuit Diagram – '02-03 Models (cont'd)



BACK

Protected by AR



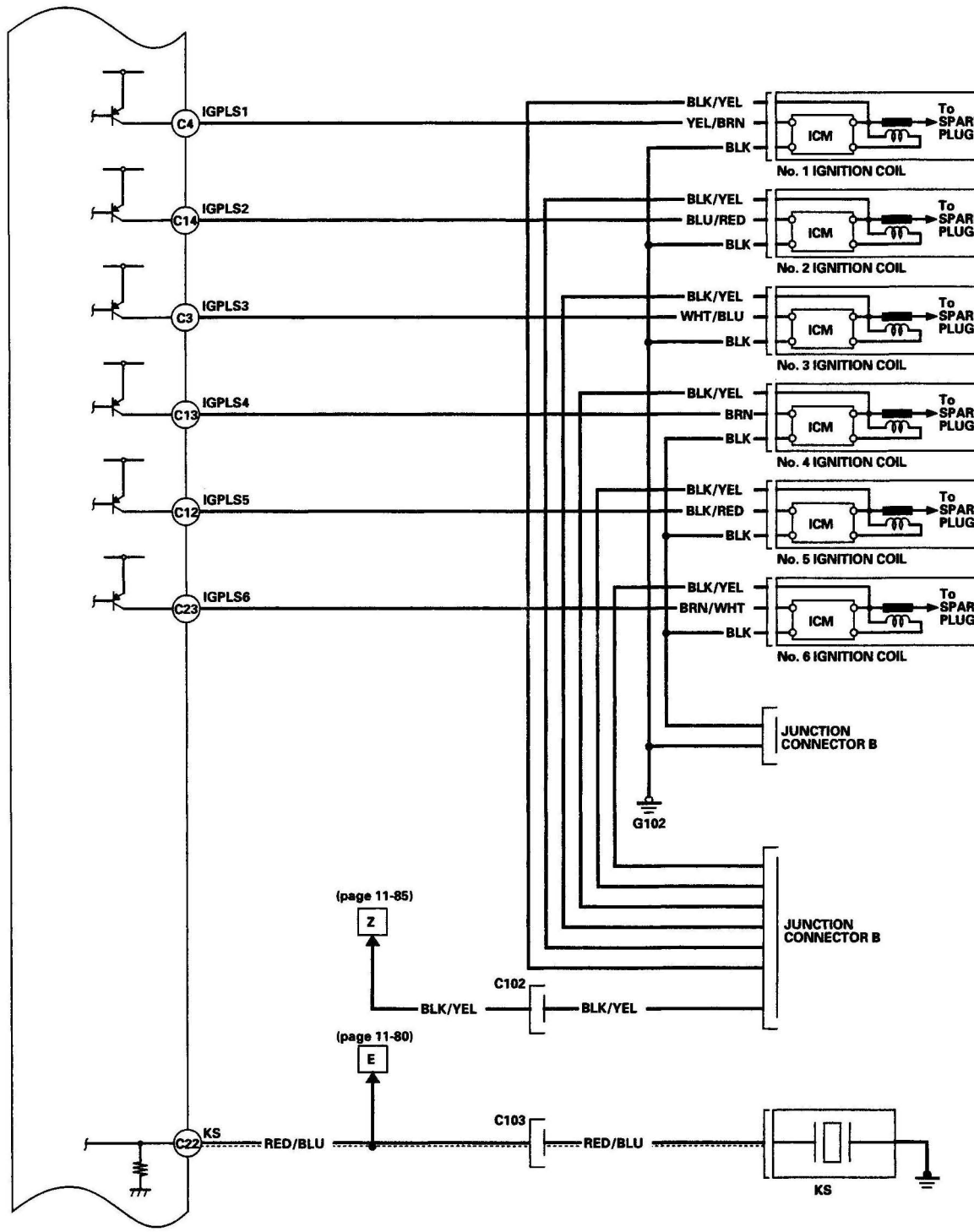
(cont'd)

BACK

Protected by AR

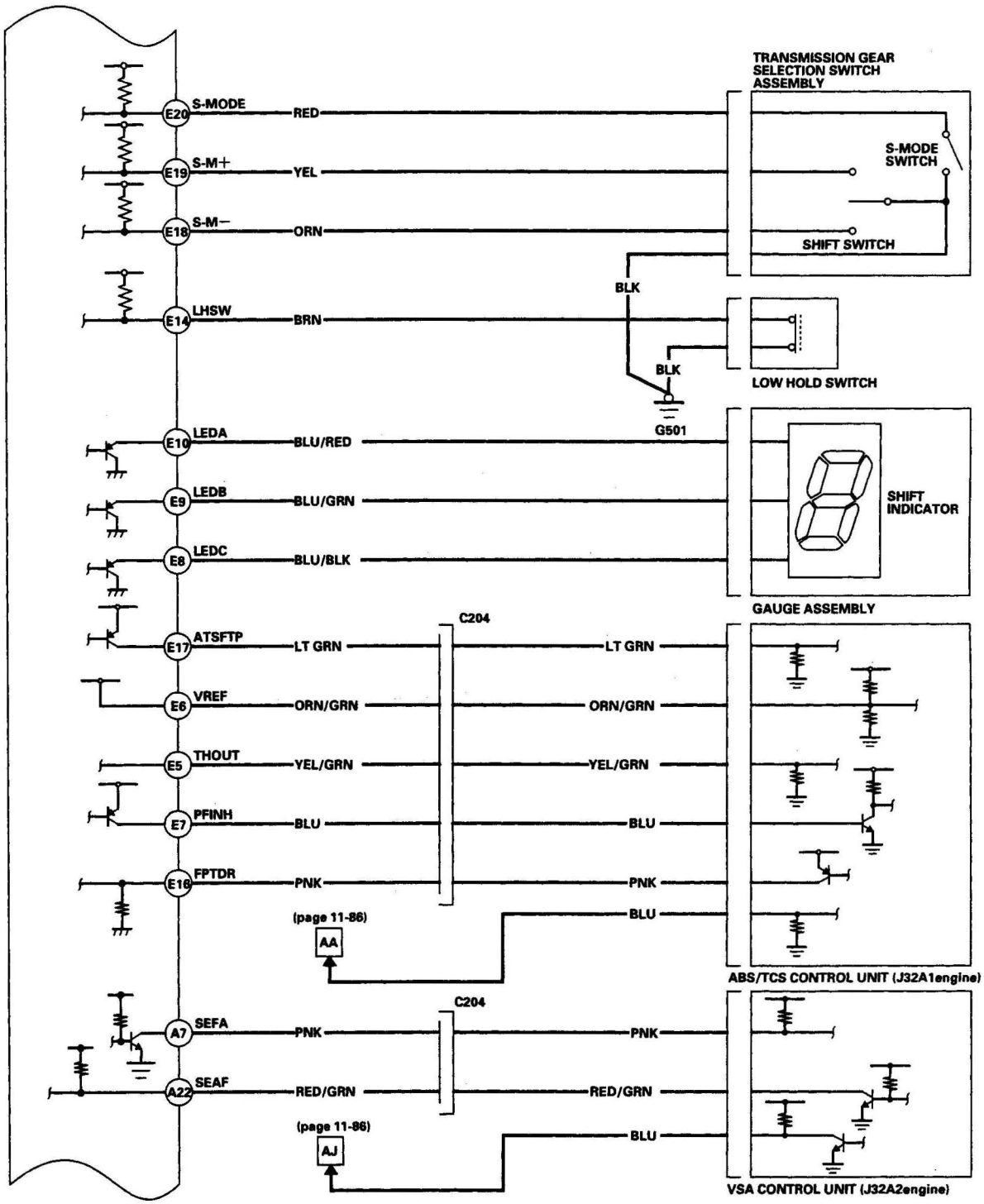
System Descriptions (cont'd)

PCM Circuit Diagram — '02-03 Models (cont'd)



BACK

Protected by AR



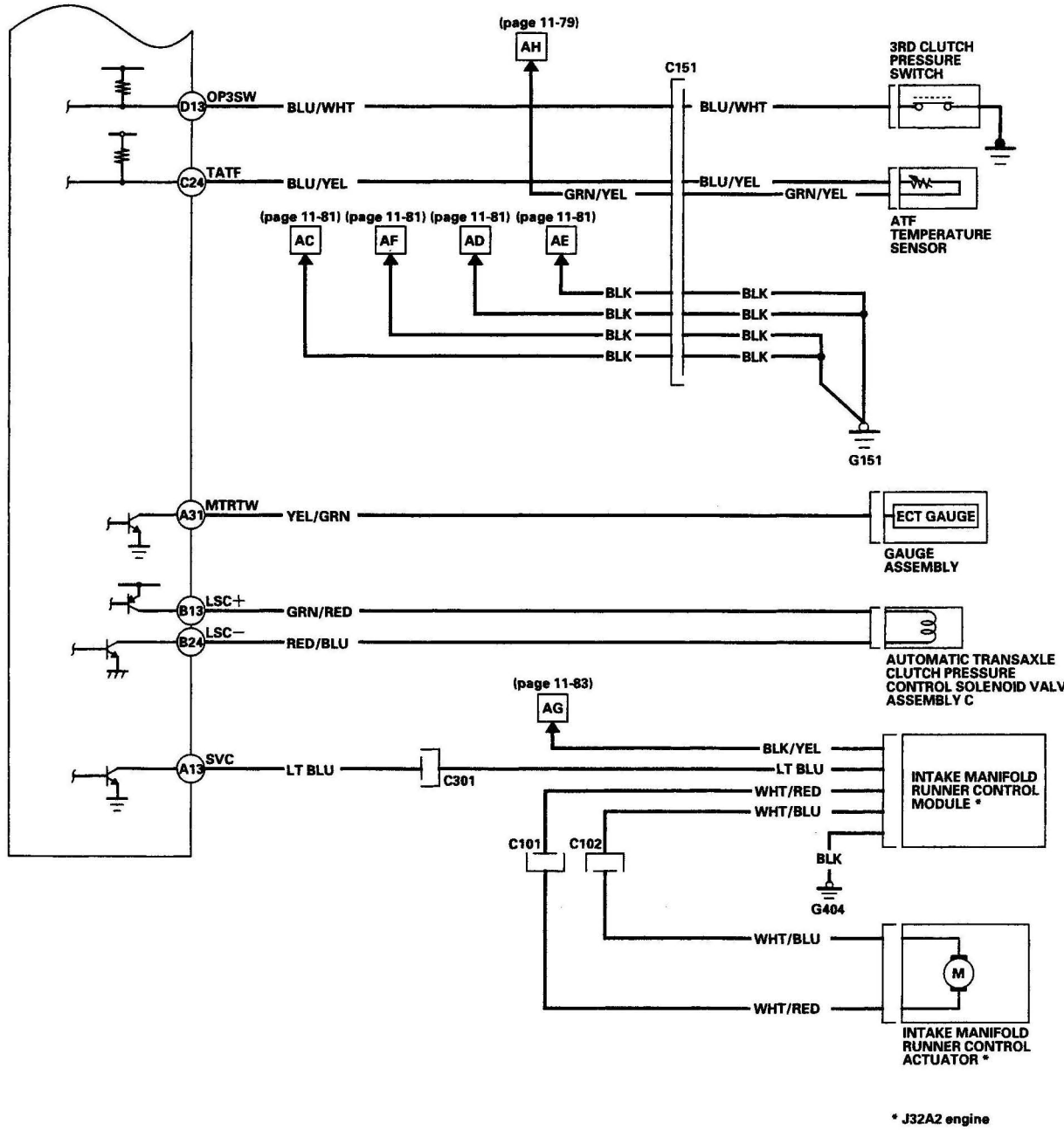
(cont'd)

BACK

Protected by AR

System Descriptions (cont'd)

PCM Circuit Diagram — '02-03 Models (cont'd)



* J32A2 engine

BACK

Protected by AR

How to Set Readiness Codes

Catalytic Converter

NOTE:
- Do not turn the ignition switch OFF.
- When the battery negative cable is disconnected, all readiness codes are cleared.

Required condition:
Ambient temperature between 20−95°F (−7−35°C).

1. Connect the scan tool to the Data Link Connector (DLC).
2. Start the engine. Hold it at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Drive for about 10 minutes without stopping on a highway or freeway. Your speed can vary.
4. With the transmission in D5 ('99 model: D4) position, drive at a steady speed between 50−62 mph (80−100 km/h) for 30 seconds.
5. Do step 4 three times. Between each repetition, close the throttle completely for 1−2 seconds. If the engine is stopped during this part of procedure, go to step 3 and do the procedure again.
6. Check for the readiness code with the scan tool.

EGR Monitor

NOTE:
- Do not turn the ignition switch OFF.
- When the battery negative cable is disconnected, all readiness codes are cleared.

1. Connect the scan tool to the Data Link Connector (DLC).
2. Start the engine, and hold it at 3,000 rpm with no load (in Park and neutral) until the radiator fan comes on.
3. Drive at a steady speed with the transmission in D5 ('99 model: D4) position between 50−62 mph (80−100 km/h) for more than 10 seconds.
4. With the transmission in D5 ('99 model: D4) position, decelerate from 62 mph (100 km/h) by completely releasing the throttle for at least 5 seconds. If the engine is stopped during this part of procedure, go to step 3 and do the procedure again.
5. Check for the readiness code with the scan tool.

(cont'd)

BACK

Protected by AR

How to Set Readiness Codes (cont'd)

EVAP Leak Monitor

NOTE:
- When the battery negative cable is disconnected, all readiness codes are cleared.
- If the engine is stopped while doing the procedure between step 6 and 16, do this procedure from step 1 again.

1. Make sure the gasoline level is 60−90 % of fuel tank capacity (not full).
2. Turn the ignition switch OFF.
3. Let the vehicle sit more than 8 hours.
4. Make sure the outside temperature is 20−95°F (−7−35°C).
5. Connect the scan tool to the Data Link Connector (DLC).
6. Start the engine and drive for about 15 minutes.
7. Keep the vehicle at a steady speed between 50−70 mph (80−114 km/h), without moving the accelerator pedal, for about 1 minute.
8. Stop the vehicle (do not stop engine).
9. Repeat steps 7 and 8 two more times.
10. Check for the readiness code with the scan tool. If the readiness code does not set, go to step 11.
11. When ambient temperature is less than 32°F (0°C), hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
12. When ambient temperature is more than 86°F (30°C), remove the fuel fill cap, then install the fuel fill cap.
13. After step 12, drive for about 20 minutes on a freeway.
14. Keep the vehicle at a steady speed between 50−70 mph (80−114 km/h), without moving the accelerator pedal, for about 1 minute.
15. Stop the vehicle (do not stop the engine).
16. Repeat steps 14 and 15 two more times.
17. Check for the readiness code with the scan tool.

HO2S Monitor

NOTE:
- Do not turn the ignition switch OFF.
- When the battery negative cable is disconnected, all readiness codes are cleared.

Required condition:
Ambient temperature between 20−95°F (−7−35°C).

1. Connect the scan tool to the Data Link Connector (DLC).
2. Start the engine, and hold it at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Let the engine idle for 5 seconds.
4. Drive at a steady speed between 50−62 mph (80−100 km/h) for about 2 minutes.
5. With the transmission in D5 ('99 model: D4) position, decelerate from 62 mph (100 km/h) by completely releasing the throttle for at least 5 seconds. If the engine is stopped during this part of procedure, go to step 4 and do the procedure again.
6. Check for the readiness code with the scan tool.

HO2S Heater Monitor

NOTE: When the battery negative cable is disconnected, all readiness codes are cleared.

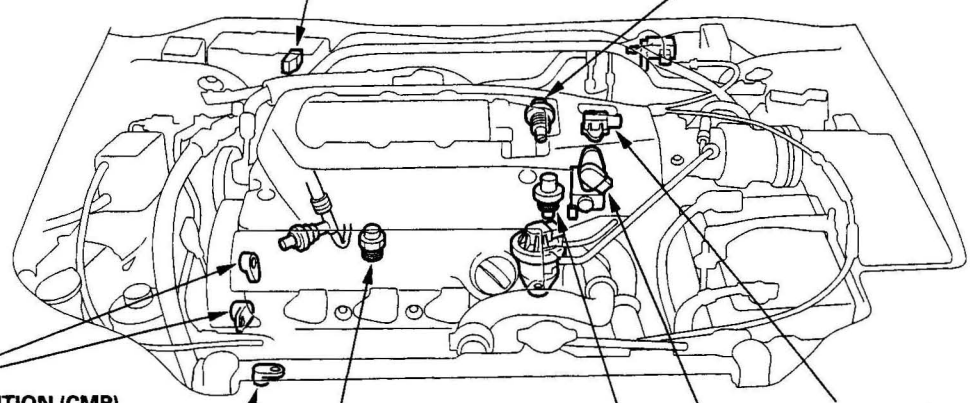
1. Connect the scan tool to the Data Link Connector (DLC).
2. Start the engine, and let the engine idle for 10 minutes.
3. Check for the readiness code with the scan tool.

BACK

Protected by AR

Component Location Index

NOTE: The illustration shows the J32A2 engine.



ELECTRICAL LOAD DETECTOR (ELD)
Troubleshooting, page 11-128

INTAKE AIR TEMPERATURE (IAT) SENSOR
Troubleshooting, page 11-99

CAMSHAFT POSITION (CMP) SENSOR (TOP DEAD CENTER (TDC) SENSOR: '99-01 models) A/B
Troubleshooting, page 11-131

KNOCK SENSOR
Troubleshooting, page 11-124

CRANKSHAFT POSITION (CKP) SENSOR
Troubleshooting, page 11-125

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
Troubleshooting, page 11-96

THROTTLE POSITION (TP) SENSOR
Troubleshooting, page 11-104

ENGINE COOLANT TEMPERATURE (ECT) SENSOR
Troubleshooting, page 11-101

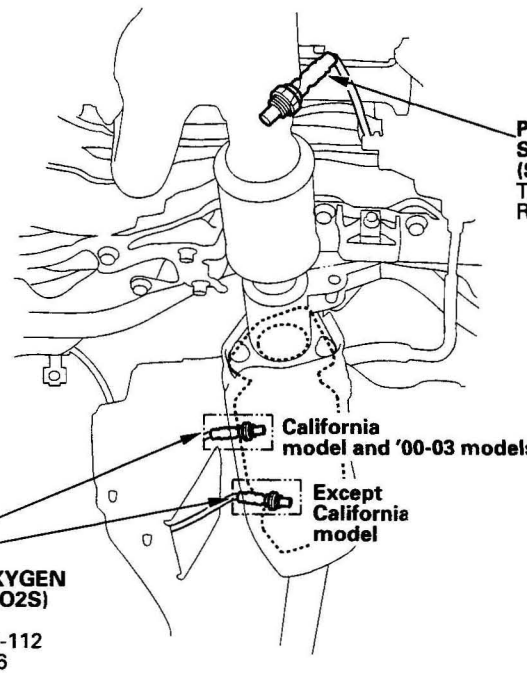
(cont'd)

BACK

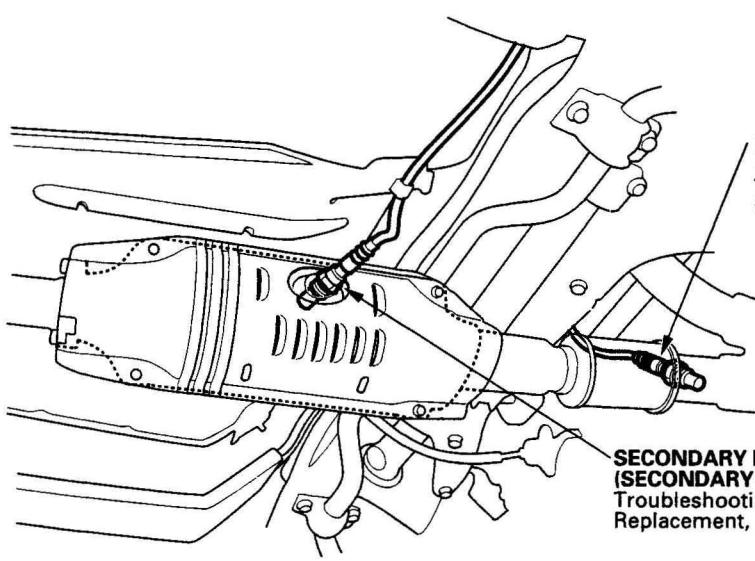
Protected by AR

Component Location Index (cont'd)

J32A1 engine:



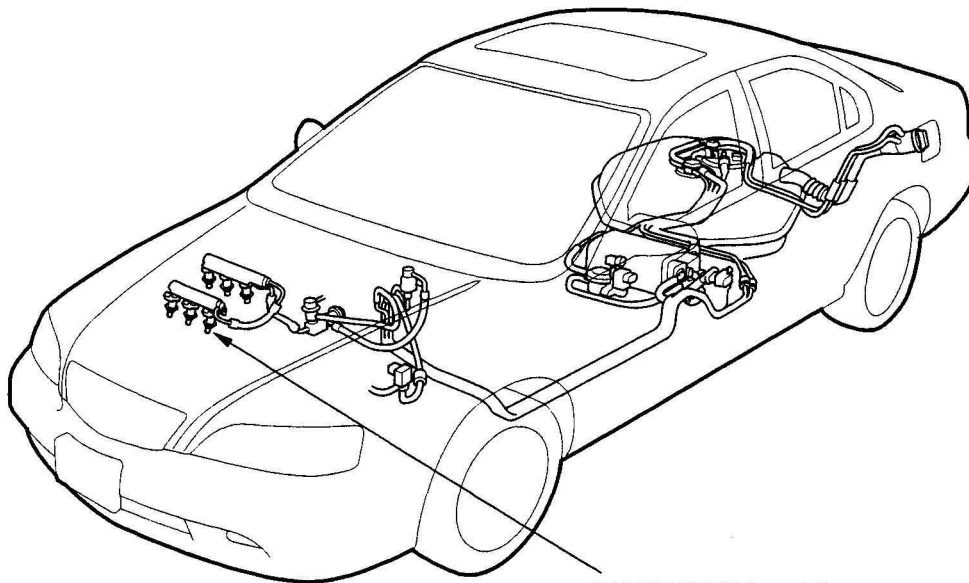
J32A2 engine:



BACK

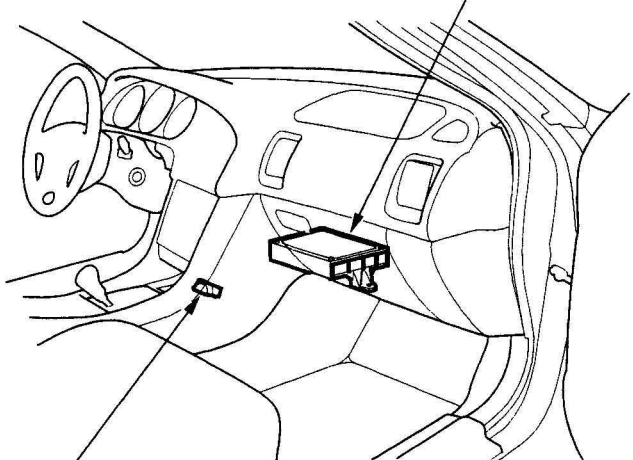
Protected by AR

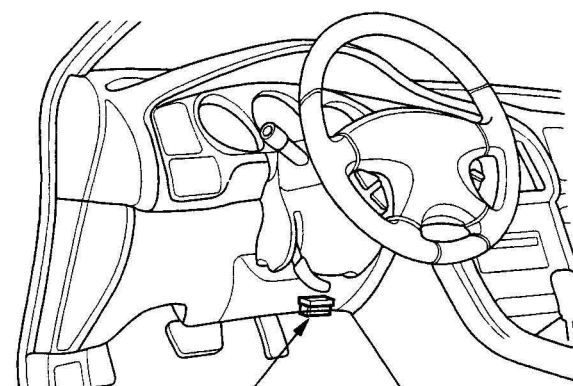
NOTE: The illustlation shows '00-03 models.



INJECTORS ('99 model)
Replacement, page 11-142
INJECTORS ('00-03 models)
Replacement, page 11-144

POWERTRAIN CONTROL MODULE (PCM)
General Troubleshooting Information, page 11-3
Troubleshooting, page 11-135





DATA LINK CONNECTOR (DLC) ('99-02 models)
General Troubleshooting Information, page 11-3

DATA LINK CONNECTOR (DLC) ('03 model)
General Troubleshooting Information, page 11-3

BACK

Protected by AR

DTC Troubleshooting

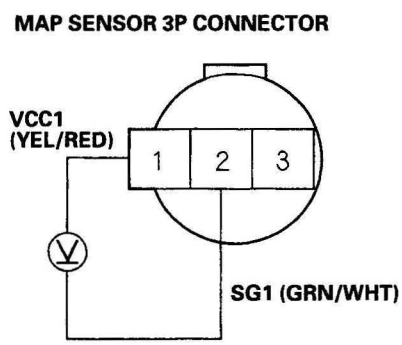
DTC P0107: MAP Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the MAP with the scan tool.

   Is about 101 kPa (760 mmHg, 30 in.Hg) or 2.9 V indicated?

   YES – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the MAP sensor and the PCM. ■

   NO – Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the MAP sensor connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between the MAP sensor connector terminals No. 1 and No. 2.



Wire side of female terminals

Is there about 5 V?

YES – Go to step 7.

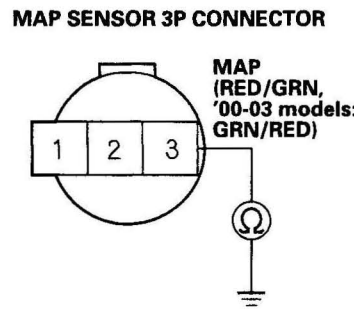
NO – Repair open in the wire between the PCM (C19) and the MAP sensor. ■

7. Check the MAP with the scan tool.

   Is 2 kPa (15 mmHg, 0.6 in.Hg) or less indicated?

   YES – Go to step 8.

   NO – Replace the MAP sensor. ■
8. Turn the ignition switch OFF.
9. Disconnect the PCM connector C (31P).
10. Check for continuity between the MAP sensor connector terminal No. 3 and body ground.



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C17) and the MAP sensor. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

BACK

Protected by AR

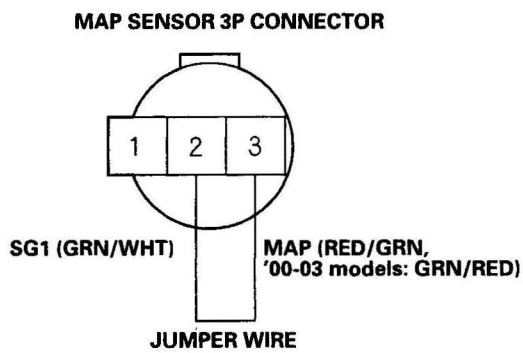
DTC P0108: MAP Sensor Circuit High Voltage

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check the MAP with the scan tool.

   Is about 101 kPa (780 mmHg, 30 in.Hg) or higher or about 2.9 V indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the MAP sensor and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the MAP sensor connector.
5. Connect MAP sensor 3P connector terminals No. 2 and No. 3 with a jumper wire.



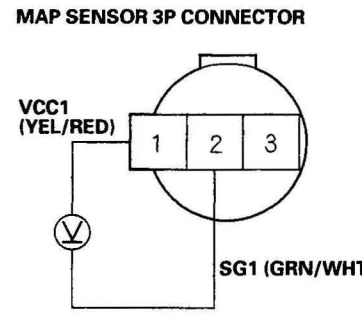
Wire side of female terminals

6. Turn the ignition switch ON (II).
7. Check the MAP with the scan tool.

   Is about 159 kPa (1,190 mmHg, 47 in.Hg) or higher or 4.49 V or higher indicated?

   YES – Go to step 8.

   NO – Replace the MAP sensor. ■
8. Remove the jumper wire.
9. Measure voltage between MAP sensor 3P connector terminals No. 1 and No. 2.

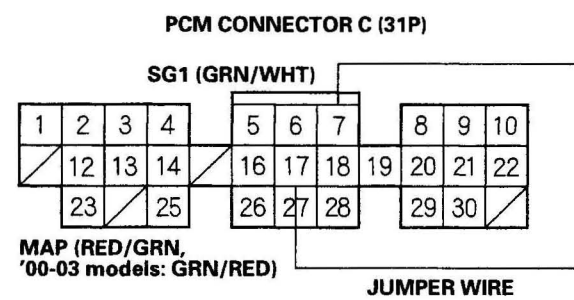


Wire side of female terminals

   Is there about 5 V?

   YES – Go to step 10.

   NO – Repair open in the wire between the PCM (C7) and the MAP sensor. ■
10. Turn the ignition switch OFF.
11. Connect PCM connector terminals between C7 and C17 with a jumper wire.



Wire side of female terminals

12. Turn the ignition switch ON (II).
13. Check the MAP with the scan tool.

    Is about 159 kPa (1,190 mmHg, 47 in.Hg) or higher or about 4.49 V or higher indicated?

    YES – Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

    NO – Repair open in the wire between the PCM (C17) and the MAP sensor. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

DTC P1128: MAP Sensor Signal Lower Than Expected

1. Turn the ignition switch ON (II).
2. Check the MAP with the scan tool.

   Is 54.1 kPa (406 mmHg, 16.0 in.Hg) or higher indicated?

   YES – Intermittent failure, system is OK at this time. ■

   NO – Replace the MAP sensor. ■

DTC P1129: MAP Sensor Signal Higher Than Expected

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check the MAP with the scan tool.

   Is 43.3 kPa (325 mmHg, 12.8 in.Hg) or less indicated?

   YES – Intermittent failure, system is OK at this time. ■

   NO – Replace the MAP sensor. ■

BACK

Protected by AR

DTC P0112: IAT Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

   Is 302°F (150°C) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

   YES – Go to step 3.

   NO – Go to step 8.
3. Disconnect the IAT sensor 2P connector.
4. Check the IAT with the scan tool.

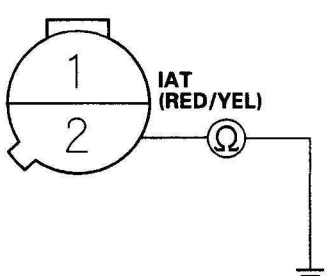
   Is 302°F (150°C) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

   YES – Go to step 5.

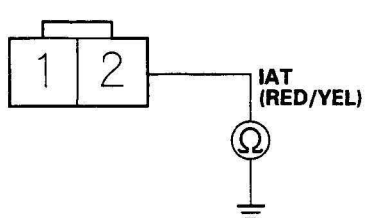
   NO – Replace the IAT sensor. ■
5. Turn the ignition switch OFF.
6. Disconnect the PCM connector C (31P).
7. Check the continuity between IAT sensor 2P connector terminal No. 2 and body ground.

IAT SENSOR 2P CONNECTOR

'99 model:



'00-03 models:



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C25) and the IAT sensor. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

8. Check the temperature reading on the scan tool.

   NOTE: If the engine is warm, the reading will be higher than ambient temperature.

   Is the correct ambient temperature indicated? Be aware that if the engine is warm, the reading will be higher than ambient temperature. If the engine is cold, the IAT and ECT will have the same valve.

   YES – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IAT sensor and the PCM. ■

   NO – Replace the IAT sensor. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0113: IAT Sensor Circuit High Voltage

1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

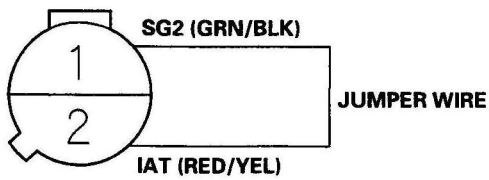
   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   YES—Go to step 3.

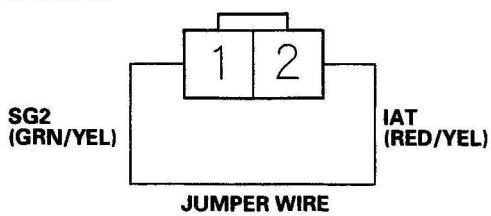
   NO—Intermitent failure, system is OK at this time. Check for poor connections or loose wires at the IAT sensor and the PCM.■
3. Disconnect the IAT sensor 2P connector.
4. Connect IAT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.

IAT SENSOR 2P CONNECTOR

'99 model:



'00-03 models:



Wire side of female terminals

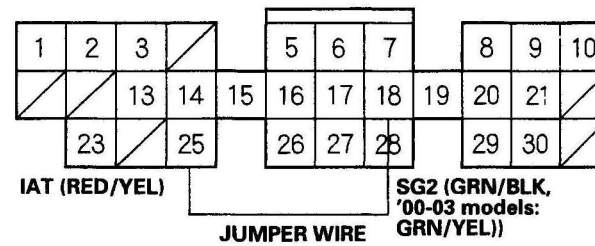
5. Check the IAT with the scan tool.

   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   YES—Go to step 6.

   NO—Replace the IAT sensor.■
6. Turn the ignition switch OFF.
7. Connect PCM connector terminals C18 and C25 with a jumper wire.

PCM CONNECTOR C (31P)



Wire side of female terminals

8. Turn the ignition switch ON (II).
9. Check the IAT with the scan tool.

   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   YES—Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM.■

   NO—Repair open in the wire between the PCM (C18, C25) and the IAT sensor.■

BACK

Protected by AR

DTC P0116: ECT Sensor Range/Performance Problem

NOTE: If DTC P0117 and/or P0118 are stored at the same time as DTC P0116, troubleshoot those DTCs first, then recheck for DTC P0116.

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.

2. Check the ECT with the scan tool.

   Is 176–200°F (80–93°C) or 0.4–0.7 V indicated?

   YES – Intermittent failure, system is OK at this time. Check the thermostat and the cooling system. ■

   NO – Check the thermostat and the cooling system. If they are OK, replace the ECT sensor. ■

DTC P0117: ECT Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).

2. Check the ECT with the scan tool.

   Is 302°F (150°C) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ECT sensor and the PCM. ■

3. Disconnect the ECT sensor 2P connector.

4. Check the ECT with the scan tool.

   Is 302°F (150°C) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

   YES – Go to step 5.

   NO – Replace the ETC sensor. ■

5. Turn the ignition switch OFF.

6. Disconnect the PCM connector C (31P).

(cont'd)

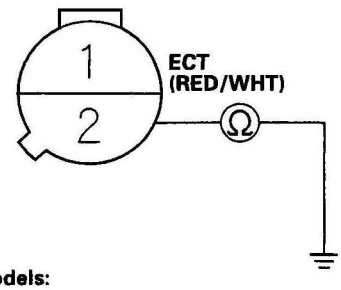
Protected by AR

DTC Troubleshooting (cont'd)

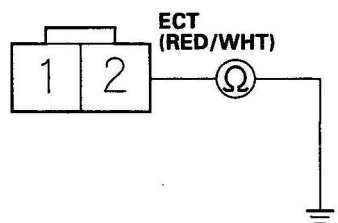
7. Check for continuity between ECT sensor 2P connector terminal No. 2 and body ground.

ECT SENSOR 2P CONNECTOR

'99 model:



'00-03 models:



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (C26) and the ECT sensor.■

NO—Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM.■

BACK

Protected by AR

DTC P0118: ECT Sensor Circuit High Voltage

1. Turn the ignition switch ON (II).
2. Check the ECT with the scan tool.

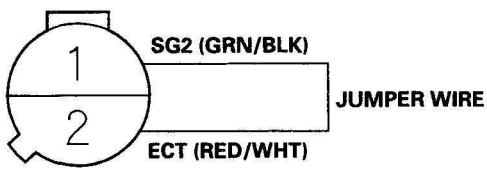
   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   YES − Go to step 3.

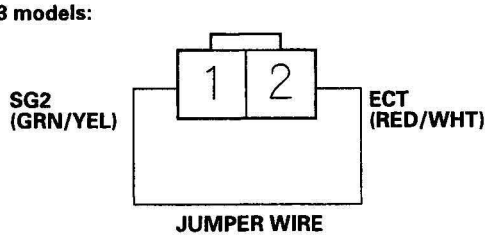
   NO − Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ECT sensor and the PCM. ■
3. Disconnect the ECT sensor 2P connector.
4. Connect ECT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.

ECT SENSOR 2P CONNECTOR

'99 model:



'00-03 models:



Wire side of female terminals

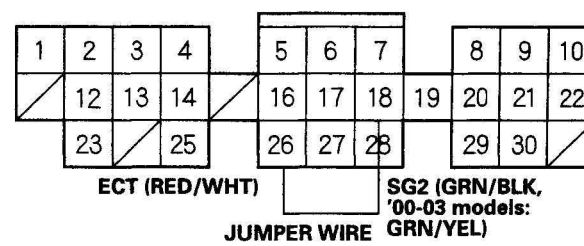
5. Check the ECT with the scan tool.

   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   YES − Go to step 6.

   NO − Replace the ECT sensor. ■
6. Turn the ignition switch OFF.
7. Connect PCM connector terminals C18 and C26 with a jumper wire.

PCM CONNECTOR C (31P)



Wire side of female terminals

8. Turn the ignition switch ON (II).
9. Check the ECT with the scan tool.

   Is −4°F (−20°C) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   YES − Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

   NO − Repair open in the wire between the PCM (C18, C26) and the ECT sensor. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

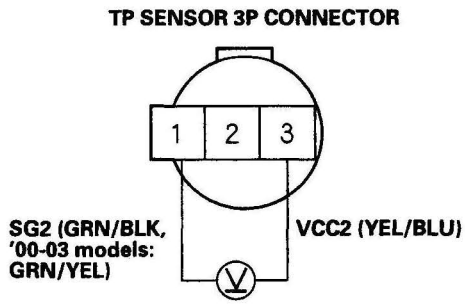
DTC P0122: TP Sensor Circuit Low Voltage

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON (II).
3. Check the throttle position with the scan tool.

   Is there about 10% when the throttle is fully closed and about 90% when the throttle is fully opened?

   YES – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the TP sensor and the PCM. ■

   NO – Go to step 4.
4. Turn the ignition switch OFF.
5. Disconnect the TP sensor 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between TP sensor 3P connector terminals No. 1 and No. 3.



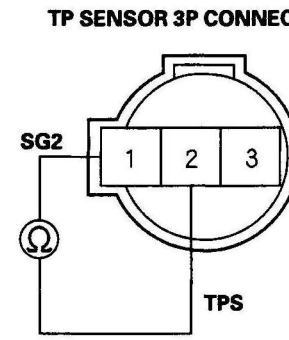
Wire side of female terminals

Is there about 5 V?

YES – Go to step 8.

NO – Go to step 14.

8. Turn the ignition switch OFF.
9. At the sensor side, measure resistance between TP sensor 3P connector terminals No. 1 and No. 2 with the throttle fully closed.



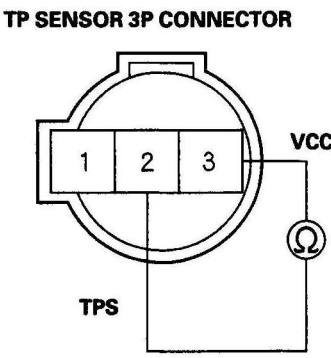
Terminal side of male terminals

Is there about 0.5 – 0.9 kΩ ?

YES – Go to step 10.

NO – Replace the throttle body. ■

10. Measure resistance between TP sensor 3P connector terminals No. 2 and No. 3 with the throttle fully closed.



Terminal side of male terminals

Is there about 4.5kΩ ?

YES – Go to step 11.

NO – Replace the throttle body. ■

11. Reconnect the TP sensor connector.

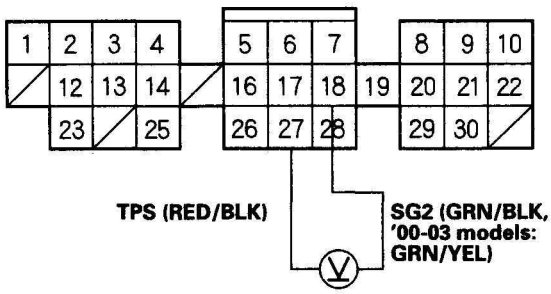
BACK

Protected by AR

12. Turn the ignition switch ON (II).

13. Measure voltage between PCM connector terminals C18 and C27.

PCM CONNECTOR C (31P)



Wire side of female terminals

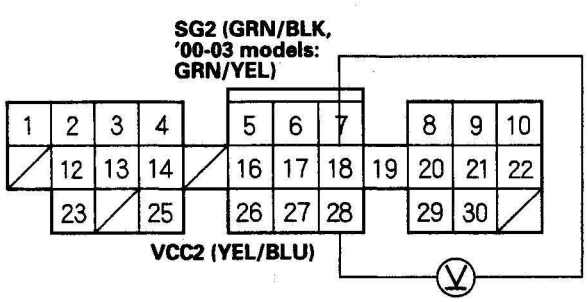
Is there about 0.5 V when the throttle is fully closed and about 4.5 V when the throttle is fully opened?

YES—Substitute a known-good PCM and recheck (see page 11-5). If voltage is normal, replace the original PCM.■

NO—Repair short or open in the wire between the PCM (C27) and the TP sensor.■

14. Measure voltage between PCM connector terminals C18 and C28.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about 5V?

YES—Repair open in the wire between the PCM (C28) and the TP sensor.■

NO—Substitute a known-good PCM and recheck (see page 11-5). If voltage is normal, replace the original PCM.■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

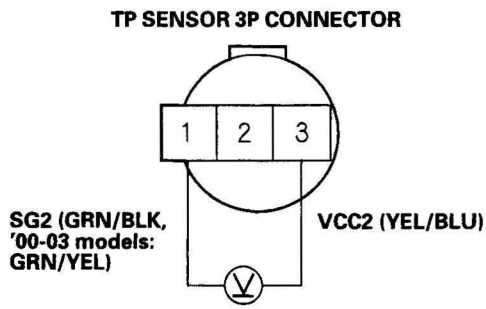
DTC P0123: TP Sensor Circuit High Voltage

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON (II).
3. Check the throttle position with the scan tool.

   Is there about 10% when the throttle is fully closed and about 90% when the throttle is fully opened?

   YES – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the TP sensor and the PCM. ■

   NO – Go to step 4.
4. Turn the ignition switch OFF.
5. Disconnect the TP sensor 3P connector.
6. Turn the ignition switch ON (II).
7. At the wire harness side, measure voltage between TP sensor 3P connector terminals No. 1 and No. 3.



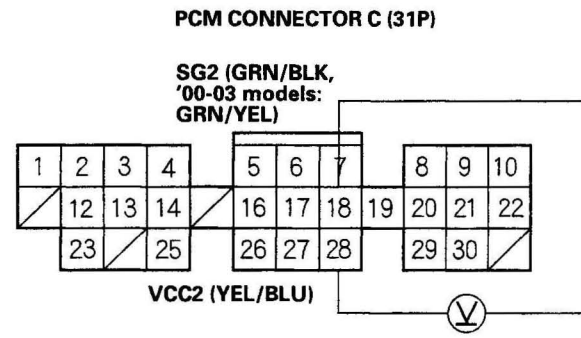
Wire side of female terminals

Is there about 5 V?

YES – Replace the throttle body. ■

NO – Go to step 8.

8. Measure voltage between PCM connector terminals C18 and C28.



Wire side of female terminals

Is there about 5 V?

YES – Repair open in the wire between the PCM (C18) and the TP sensor. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If voltage is normal, replace the original PCM. ■

BACK

Protected by AR

DTC P1121: TP Sensor Signal Lower Than Expected

1. Turn the ignition switch ON (II).
2. Check the throttle position with the scan tool.

   Is 13.7 % or higher indicated when the throttle is fully opened?

   YES – Intermittent failure, system is OK at this time. ■

   NO – Replace the throttle body. ■

DTC P1122: TP Sensor Signal Higher Than Expected

1. Turn the ignition switch ON (II).
2. Check the throttle position with the scan tool.

   Is 16.9 % or less indicated when the throttle is fully closed?

   YES – Intermittent failure, system is OK at this time. ■

   NO – Replace the throttle body. ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0128 ('02-03 Models): Range/ Performance Problem in Thermostat

NOTE: If the DTCs listed below are stored the same time as DTC P0128, troubleshoot those DTCs first, then recheck for P0128.

P0107, P0108, P1129: MAP Sensor
P1106, P1107, P1108: Barometric Pressure Circuit
P1259: VTEC system
P0401: EGR Flow Insufficient
P1491: EGR Valve Position Insufficient
P1498: EGR Valve Position Sensor High Voltage
P0116, P0117, P0118: Engine Coolant Temperature Circuit
P0112, P0113: Intake Air Tenperature Circuit
P0335, P0336, P1359: Crankshaft Position Sensor
P0300: Random Misfire
P0301, P0302, P0303, P0304, P0305, P0306: Cylinder 1, 2, 3, 4, 5, or 6 Misfire Detected
P0505: Idle Control System Malfuction
P1519: Idle Air Control Valve

DTC P0128 can occasionally set when the hood is opened.

1. Check the engine coolant level.

   Is the engine coolant level low?

   YES—Refill the engine coolant. If necessary, check the cooling system.■

   NO—Go to step 2.

2. Turn the ignition switch ON (II).

3. Check the radiator fan.

   Dose the radiator fan keep running?

   YES—J32A1 engine: Check the radiator fan circuit (see page 10-22), radiator fan switch circuit (see page 10-24), and the radiator fan switch (see page 10-33).
   J32A2 engine: Check the radiator fan circuit (see page 10-21), radiator fan switch circuit (see page 10-21), and the radiator fan switch (see page 10-21).

   - If they are OK, substitute the PCM and recheck (see page 11-5).
   - If the symptom/indicator goes away, replace the original PCM.■

   NO—Test the thermostat (see page 10-11).■

BACK

Protected by AR

DTC P0131: Primary HO2S (Sensor 1) Circuit Low Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the primary HO2S (Sensor 1) output voltage with the scan tool during acceleration using wide open throttle.

   Does the voltage stay at 0.5 V or less?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and the PCM. ■
4. Check the fuel pressure (see page 11-164).

   Is it normal?

   YES – Go to step 5.

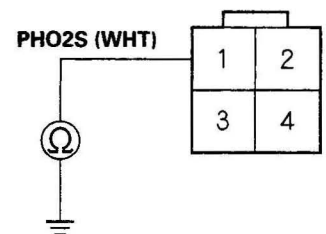
   NO – Repair the fuel supply system. ■
5. Turn the ignition switch OFF.
6. Disconnect the primary HO2S (Sensor 1) 4P connector.
7. Start the engine and let it idle.
8. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

   Does it stay at 0.5 V or less?

   YES – Go to step 9.

   NO – Replace the primary HO2S (Sensor 1). ■
9. Turn the ignition switch OFF.
10. Disconnect the PCM connector C (31P).
11. Check for continuity between primary HO2S (Sensor 1) 4P connector terminal No. 1 and body ground.

PRIMARY HO2S (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C16) and the primary HO2S (Sensor 1). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

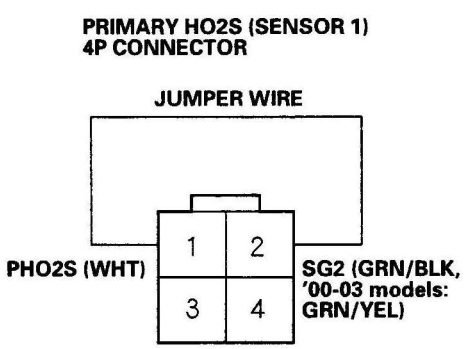
DTC P0132: Primary HO2S (Sensor 1) Circuit High Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

   Does the voltage stay at 1.5 V or more?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and the PCM. ■
4. Turn the ignition switch OFF.
5. Disconnect the primary HO2S (Sensor 1) 4P connector.
6. Connect primary HO2S (Sensor 1) 4P connector terminals No. 1 and No. 2 with a jumper wire.



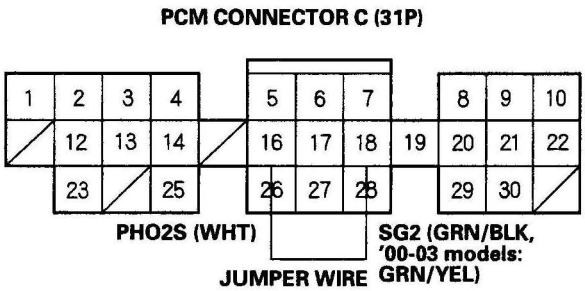
Wire side of female terminals

7. Turn the ignition switch ON (II).
8. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

   Is there 1.5 V or more?

   YES – Go to step 9.

   NO – Replace the primary HO2S (Sensor 1). ■
9. Turn the ignition switch OFF.
10. Connect PCM connector terminals C16 and C18 with a jumper wire.



Wire side of female terminals

11. Turn the ignition switch ON (II).
12. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

    Is there 1.5 V or more?

    YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

    NO – Repair open in the wire between the PCM (C16, C18) and the primary HO2S (Sensor 1). ■

BACK

Protected by AR

DTC P0133: Primary HO2S (Sensor 1) Slow Response

NOTE: If DTC P0131, P0132 and/or P0135 are stored at the same time as DTC P0133, troubleshoot those DTCs first, then recheck for DTC P0133.

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Test-drive under following conditions.
   - 55 mph (89 km/h) steady speed
   - Transmission in D4 position
   - Until readiness code or Temporary DTC P0133 comes on
4. Check for a Temporary DTC with the scan tool.

   Is Temporary DTC P0133 indicated?

   YES—*Replace the primary HO2S (Sensor 1).*■

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1), and the PCM.■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0137: Secondary HO2S (Sensor 2) Circuit Low Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the secondary HO2S (Sensor 2) output voltage at 3,000 rpm with the scan tool.

   Does the voltage stay at 0.3 V or less?

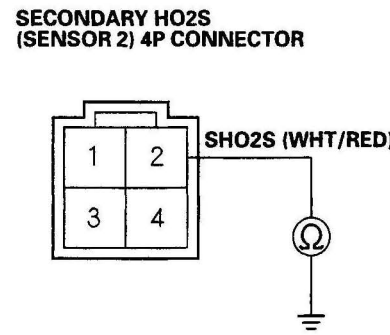
   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2), and the PCM. ■
4. Turn the ignition switch OFF.
5. Disconnect the secondary HO2S (Sensor 2) 4P connector.
6. Start the engine.
7. Check the secondary HO2S (Sensor 2) output voltage with the scan tool.

   Does the voltage stay at 0.3 V or less?

   YES – Go to step 8.

   NO – Replace the secondary HO2S (Sensor 2). ■
8. Turn the ignition switch OFF.
9. Disconnect the PCM connector A (32P).
10. Check for continuity between secondary HO2S (Sensor 2) 4P connector terminal No. 2 and body ground.



Terminal side of male terminals

Is there continuity?

YES – Repair short in the wire between the PCM (A23, '00-03 models: A1) and the secondary HO2S (Sensor 2). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.

BACK

Protected by AR

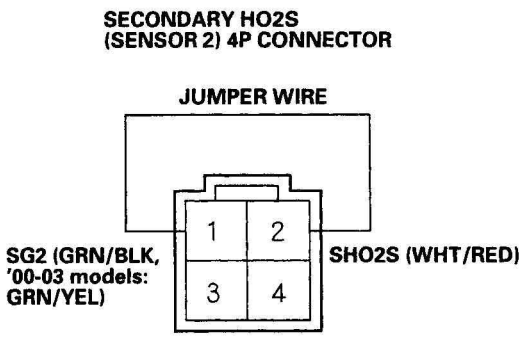
DTC P0138: Secondary HO2S (Sensor 2) Circuit High Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the secondary HO2S (Sensor 2) output voltage at 3,000 rpm with the scan tool.

   Does the voltage stay at 0.8 V or more?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2), and the PCM. ■
4. Turn the ignition switch OFF.
5. Disconnect the secondary HO2S (Sensor 2) 4P connector.
6. Connect secondary HO2S (Sensor 2) 4P connector terminals No. 1 and No. 2 with a jumper wire.



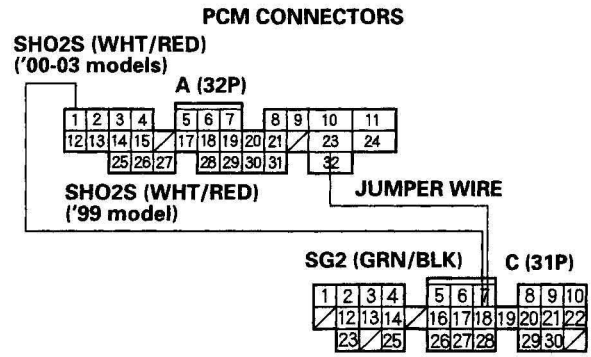
Terminal side of male terminals

7. Turn the ignition switch ON (II).
8. Check the secondary HO2S (Sensor 2) output voltage with the scan tool.

   Is there 0.8 V or more?

   YES – Go to step 9.

   NO – Replace the secondary HO2S (Sensor 2). ■
9. Turn the ignition switch OFF.
10. Connect PCM connector terminals A23 ('00-03 models: A1) and C18 with a jumper wire.



Wire side of female terminals

11. Turn the ignition switch ON (II).
12. Check the secondary HO2S (Sensor 2) output voltage with the scan tool.

    Is there 0.8 V or more?

    YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

    NO – Repair open in the wire between the PCM (A23, '00-03 models: A1, C18) and the secondary HO2S (Sensor 2). ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0139: Secondary HO2S (Sensor 2) Slow Response

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Check the secondary HO2S (Sensor 2) output voltage at 3,000 rpm with the scan tool.

   Does the voltage stay within 0.3– 0.8 V for 2 minutes?

   YES – Replace the secondary HO2S (Sensor 2). ■

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2), and the PCM. ■

BACK

Protected by AR

DTC P0135: Primary HO2S (Sensor 1) Heater Circuit Malfunction

DTC P0141: Secondary HO2S (Sensor 2) Heater Circuit Malfunction

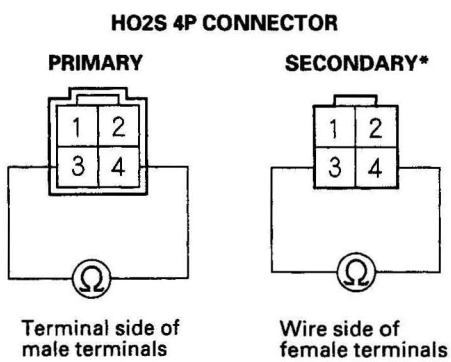
NOTE: Information marked with an asterisk (*) applies to DTC P0141.

1. Reset the PCM (see page 11-4).
2. Start the engine.

   Is DTC P0135 or P0141 indicated?

   YES – Go to step 3.

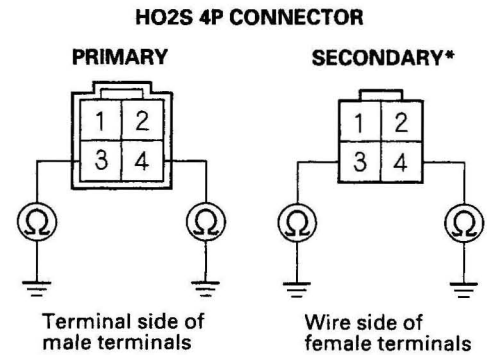
   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1), the secondary HO2S (Sensor 2), and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the HO2S (primary or secondary *) (Sensor 1 or Sensor 2 *) 4P connector.
5. At the HO2S side, measure resistance between HO2S 4P connector terminals No. 3 and No. 4.



   Is there 10 – 40 Ω ?

   YES – Go to step 6.

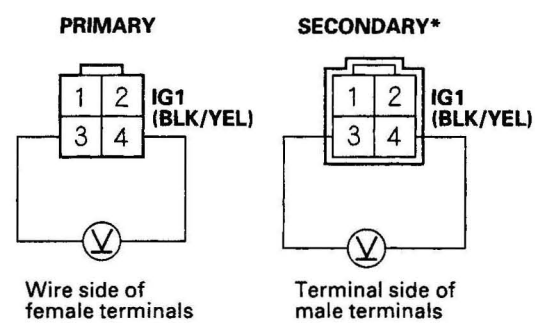
   NO – Replace the primary HO2S (Sensor 1) or secondary HO2S (Sensor 2) * . ■
6. Check continuity between body ground and HO2S 4P connector terminals No. 3 and No. 4 individually.



   Is there continuity?

   YES – Replace the HO2S (primary or secondary *) (Sensor 1 or Sensor 2 *). ■

   NO – Go to step 7.
7. Start the engine.
8. At the wire harness side, measure voltage between HO2S 4P connector terminals No. 3 and No. 4.



   Is there battery voltage?

   YES – Go to step 9.

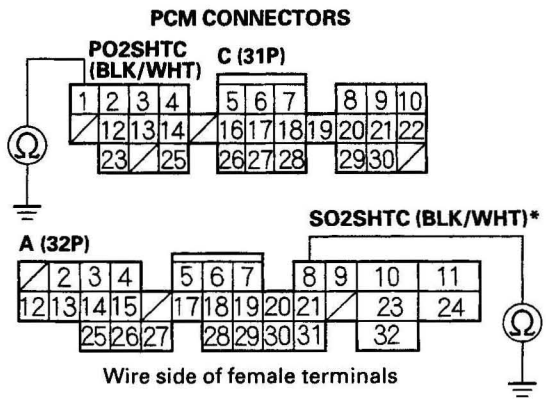
   NO – Go to step 12.
9. Turn the ignition switch OFF.
10. Disconnect the PCM connector C (31P) (PCM connector A, 32P *).

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

11. Check for continuity between PCM connector terminal C1 (A8) * and body ground.

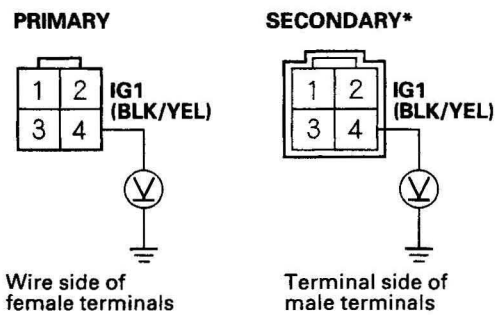


Is there continuity?

YES—Repair short in the wire between the PCM (C1, A8 *) and the HO2S (primary or secondary *) (Sensor 1, Sensor 2 *).■

NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

12. At the wire harness side, measure voltage between HO2S 4P connector terminal No. 4 and body ground.



Is there battery voltage?

YES—Go to step 13.

NO—Repair open in the wire between the primary HO2S (Sensor 1), secondary HO2S (Sensor 2) * and the No. 6 ECU (PCM) CRUISE CONTROL fuse.■

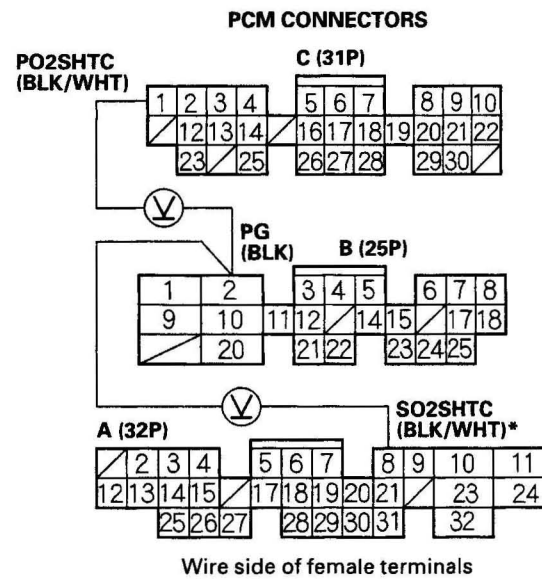
13. Turn the ignition switch OFF.

14. Reconnect the HO2S (primary or secondary *) (Sensor 1, Sensor 2 *) 4P connector.

15. Disconnect PCM connector C (31P) (PCM connector A, 32P) * .

16. Turn the ignition switch ON (II).

17. Measure voltage between PCM connector terminal C1 (A8) * and B2.



Is there 0.1 V or less?

YES—Repair open in the wire between the PCM (C1, A8 *) and HO2S (primary or secondary *) (Sensor 1, Sensor 2 *).■

NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

BACK

Protected by AR

DTC P0171: Fuel System Too Lean

DTC P0172: Fuel System Too Rich

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0171 and/or P0172, troubleshoot those DTCs first, then recheck for P0171 and/or P0172.

P0107, P0108, P1128, P1129: Manifold Absolute Pressure (MAP) sensor
P0135: Primary Heated Oxygen Sensor (primary HO2S) (Sensor 1) heater
P0137, P0138: Secondary HO2S (Sensor 2)
P0141: Secondary HO2S (Sensor 2) heater
P0401, P1491, P1498: Exhaust Gas Recirculation (EGR) system
P1259: VTEC system

1. Check the fuel pressure (see page 11-164).

   Is fuel pressure OK?

   YES—Go to step 2.

   NO—Check these items:

   - If the pressure is too high, check the fuel pressure regulator, and the fuel return pipe. ■
   - If the pressure is too low, check the fuel pump, the fuel feed pipe, the fuel filter, and the fuel pressure regulator. ■

2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.

3. Check the primary HO2S (Sensor 1) output with the scan tool.

   Does it stay at less than 0.3 V or more than 0.6 V?

   YES—Replace the primary HO2S (Sensor 1). ■

   NO—Go to step 4.

4. Turn the ignition switch OFF.

5. With a vacuum pump, apply vacuum to the Evaporative Emission (EVAP) canister purge valve from the intake manifold side.

   Does it hold vacuum?

   YES—Check the valve clearances and adjust if necessary. If the valve clearances are OK, replace the injectors. ■

   NO—Replace the EVAP canister purge valve. ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0300: Random Misfire and Any Combination of the Following:

DTC P0301: No. 1 Cylinder Misfire

DTC P0302: No. 2 Cylinder Misfire

DTC P0303: No. 3 Cylinder Misfire

DTC P0304: No. 4 Cylinder Misfire

DTC P0305: No. 5 Cylinder Misfire

DTC P0306: No. 6 Cylinder Misfire

NOTE:
- If the misfiring is frequent enough to trigger detection of increased emissions during two consecutive driving cycles, the MIL will come on, and DTC P0300 (and some combination of P0301 through P0306) will be stored.
- If the misfiring is frequent enough to damage the catalyst, the MIL will blink whenever the misfiring occurs, and DTC P0300 (and some combination of P0301 through P0306) will be stored. When the misfiring stops, the MIL will remain on.

1. Troubleshoot the following DTCs first if any of them were stored along with the random misfire DTC(s):
   P0107, P0108, P1128, P1129: Manifold Absolute Pressure (MAP) Sensor
   P0131, P0132: Primary Heated Oxygen Sensor (primary HO2S)
   P0171, P0172: Fuel system
   P0335, P0336: Crankshaft Position (CKP) Sensor
   P0401, P1491, P1498: Exhaust Gas Recirculation (EGR) system
   P0505: Idle control system
   P1259: VTEC system
   P1361, P1362, P1366, P1367: Camshaft Position (CMP) Sensor (Top Dead Center (TDC) Sensor: '99-01 models) A/B
   P1519: Idle Air Control (IAC) valve

2. Test-drive the vehicle to verify the symptom.

3. Find the symptom in the chart below, and do the related procedures in the order listed until you find the cause.

Symptom	Procedure(s)	Also check for:
Random misfire only at low RPM and under load	Check fuel pressure (see page 11-164).	• Low compression. • Low quality fuel.
Random misfire only during acceleration	Check fuel pressure (see page 11-164).	Malfunction in the VTEC system (see page 6-6).
Random misfire at high RPM, under load, or under random conditions	Check fuel pressure (see page 11-164).	Correct valve clearance (see page 6-13).

BACK

Protected by AR

DTC P0301: No. 1 Cylinder Misfire

DTC P0302: No. 2 Cylinder Misfire

DTC P0303: No. 3 Cylinder Misfire

DTC P0304: No. 4 Cylinder Misfire

DTC P0305: No. 5 Cylinder Misfire

DTC P0306: No. 6 Cylinder Misfire

1. After checking and recording the freeze data, reset the PCM (see page 11-4). If there is no freeze data of misfiring, just clear the DTC.
2. Start the engine and listen for a clicking sound at the injector in the problem cylinder.

   Does it click?

   YES – Go to step 3.

   NO – Go to step 30.
3. Turn the ignition switch OFF, and reset the PCM (see page 11-4).
4. Exchange the ignition coil from the problem cylinder with one from another cylinder.
5. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.
6. Check the DTC and the Temporary DTC with the scan tool.

   Is DTC P0301, P0302, P0303, P0304, P0305, or P0306, or Temporary DTC P1399 indicated?

   YES – Go to step 7.

   NO – Intermittent misfire due to poor contact at the ignition coil connector. (no misfire at this time). ■
7. Determine which cylinder had the misfire.

   Does the misfire occur in the other cylinder whose ignition coil was exchanged?

   YES – Replace the faulty ignition coil. ■

   NO – Go to step 8.
8. Turn the ignition switch OFF, and reset the PCM (see page 11-4).
9. Exchange the spark plug from the problem cylinder with one from another cylinder.
10. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.
11. Check the DTC and the Temporary DTC with the scan tool.

    Is DTC P0301, P0302, P0303, P0304, P0305, or P0306, or Temporary DTC P1399 indicated?

    YES – Go to step 12.

    NO – Intermittent misfire due to spark plug fouling, etc. (no misfire at this time). ■
12. Determine which cylinder had the misfire.

    Does the misfire occur in the other cylinder whose spark plug was exchanged?

    YES – Replace the faulty spark plug. ■

    NO – Go to step 13.
13. Turn the ignition switch OFF, and reset the PCM (see page 11-4).
14. Exchange the injector from the problem cylinder with one from the another cylinder.
15. Let the engine idle for 2 minutes.
16. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

17. Check the DTC and the Temporary DTC with the scan tool.

    Is DTC P0301, P0302, P0303, P0304, P0305, or P0306, or Temporary DTC P1399 indicated?

    YES – Go to step 18.

    NO – Intermittent misfire due to bad contact in the injector connector (no misfire at this time). ■

18. Determine which cylinder had the misfire.

    Does the misfire occur in the other cylinder whose injector was exchanged?

    YES – Replace the faulty injector (see page 11-142). ■

    NO – Go to step 19.

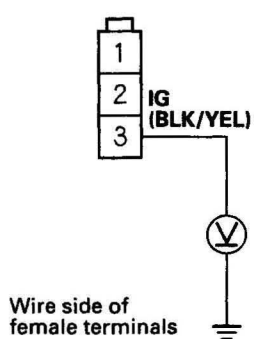
19. Turn the ignition switch OFF.

20. Disconnect the ignition coil 3P connector from the problem cylinder.

21. Turn the ignition switch ON (II).

22. Measure voltage between the ignition coil 3P connector terminal No. 3 and body ground.

IGNITION COIL 3P CONNECTOR



Is there battery voltage?

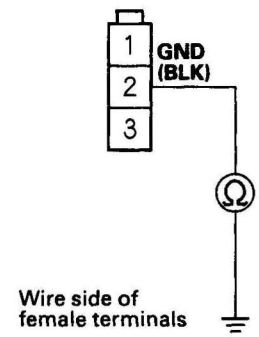
YES – Go to step 23.

NO – Repair open or short in the wire between the No. 11 COIL (15A) fuse and the ignition coil. ■

23. Turn the ignition switch OFF.

24. Check for continuity between ignition coil 3P connector terminal No. 2 and body ground.

IGNITION COIL 3P CONNECTOR



Is there continuity?

YES – Go to step 25.

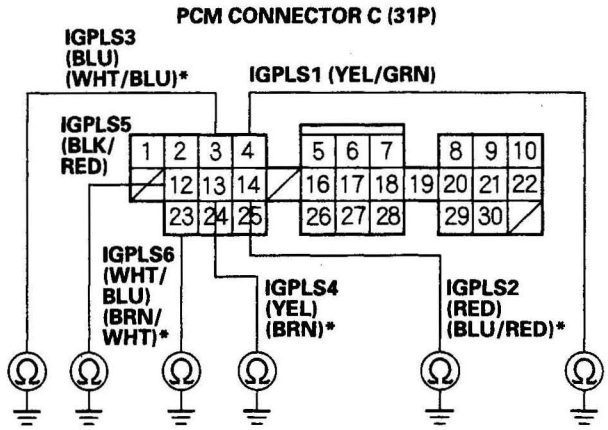
NO – Repair open in the wire between the ignition coil and G101 (or G102). ■

25. Disconnect PCM connector C (31P).

BACK

Protected by AR

26. Check for continuity between body ground and the appropriate PCM connector terminal (see table).



*: '00-01 models

Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR	
No. 1	P0301	C4	YEL/GRN	(YEL/GRN)
No. 2	P0302	C14	RED	(BLU/RED)
No. 3	P0303	C3	BLU	(WHT/BLU)
No. 4	P0304	C13	YEL	(BRN)
No. 5	P0305	C12	BLK/RED	(BLK/RED)
No. 6	P0306	C23	WHT/BLU	(BRN/WHT)

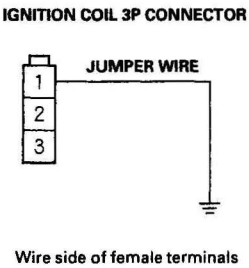
( ): '00-01 models

Is there continuity?

YES – Repair short in the wire between the PCM and the ignition coil.■

NO – Go to step 27.

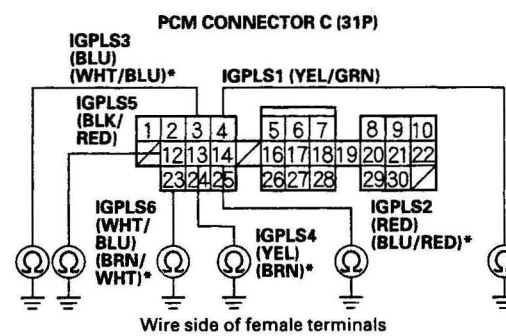
27. Connect the appropriate ignition coil 3P connector terminal No. 1 and body ground with a jumper wire (see table).



Wire side of female terminals

PROBLEM CYLINDER	DTC	WIRE COLOR	
No. 1	P0301	YEL/GRN	(YEL/GRN)
No. 2	P0302	RED	(BLU/RED)
No. 3	P0303	BLU	(WHT/BLU)
No. 4	P0304	YEL	(BRN)
No. 5	P0305	BLK/RED	(BLK/RED)
No. 6	P0306	WHT/BLU	(BRN/WHT)

28. Check for continuity between body ground and the appropriate PCM connector terminal (see table).



Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR	
No. 1	P0301	C4	YEL/GRN	(YEL/GRN)
No. 2	P0302	C14	RED	(BLU/RED)
No. 3	P0303	C3	BLU	(WHT/BLU)
No. 4	P0304	C13	YEL	(BRN)
No. 5	P0305	C12	BLK/RED	(BLK/RED)
No. 6	P0306	C23	WHT/BLU	(BRN/WHT)

( ): '00-03 models

Is there continuity?

YES – Go to step 29.

NO – Repair open in the wire between the PCM and the ignition coil.■

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

29. Check the engine compression (see page 6-6).

    Is the engine compression OK?

    YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

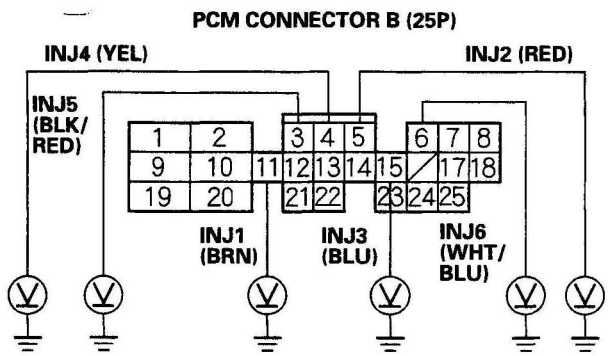
    NO—Repair the engine.■

30. Turn the ignition switch OFF.

31. Disconnect PCM connector B (25P).

32. Turn the ignition switch ON (II).

33. Measure voltage between body ground and the appropriate PCM connector terminal (see table).



Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	B11	BRN
No. 2	P0302	B5	RED
No. 3	P0303	B15	BLU
No. 4	P0304	B4	YEL
No. 5	P0305	B3	BLK/RED
No. 6	P0306	B6	WHT/BLU

Is there battery voltage?

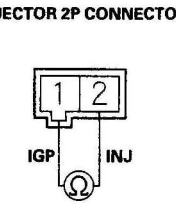
YES—Go to step 34.

NO—Go to step 42.

34. Turn the ignition switch OFF.

35. Disconnect the injector 2P connector on the problem cylinder.

36. Measure resistance between injector 2P connector terminals No. 1 and No. 2.



Terminal side of male terminals

Is there 10 Ω – 13 Ω ?

YES—Go to step 37.
NO—Replace the injector (see page 11-142).■

37. Exchange the injector from the problem cylinder with one from another cylinder, and reset the PCM (see page 11-4).

38. Let the engine idle for 2 minutes.

39. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.

40. Check the DTC and the Temporary DTC with the scan tool.

    Is DTC P0301, P0302, P0303, P0304, P0305, or P0306, or Temporary DTC P1399 indicated?

    YES—Go to step 41.
    NO—Intermittent misfire due to injector fouling, etc.■

41. Determine which cylinder had the misfire.

    Does the misfire occur in the other cylinder whose injector was exchanged?

    YES—Replace the faulty injector.■
    NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

42. Turn the ignition switch OFF.

43. Disconnect the injector 2P connector on the problem cylinder.

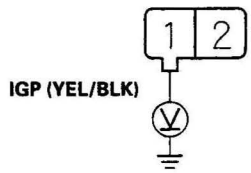
44. Turn the ignition switch ON (II).

BACK

Protected by AR

45. Measure voltage between injector 2P connector terminal No. 1 and body ground.

INJECTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

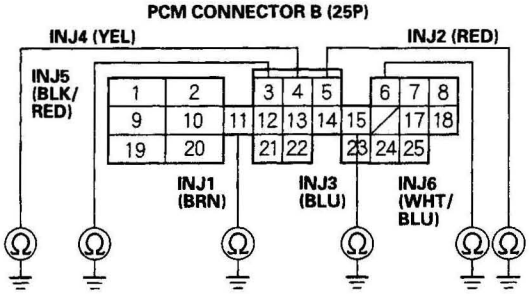
YES – Go to step 46.

NO – Repair open in the wire between the injector and the PGM-FI main relay. ■

46. Turn the ignition switch OFF.

47. Check for continuity between body ground and the appropriate PCM connector terminal (see table).

PCM CONNECTOR B (25P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	B11	BRN
No. 2	P0302	B5	RED
No. 3	P0303	B15	BLU
No. 4	P0304	B4	YEL
No. 5	P0305	B3	BLK/RED
No. 6	P0306	B6	WHT/BLU

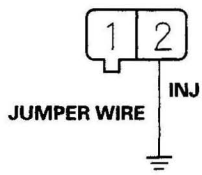
Is there continuity?

YES – Repair short in the wire between the PCM and the injector. ■

NO – Go to step 48.

48. Connect the appropriate injector 2P connector terminal No. 2 to body ground with a jumper wire (see table).

INJECTOR 2P CONNECTOR

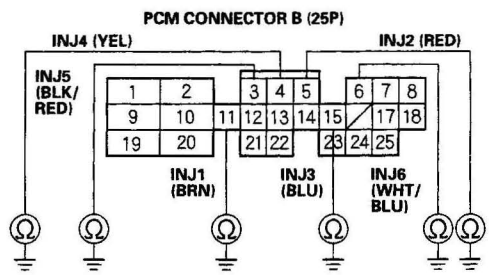


Wire side of female terminals

PROBLEM CYLINDER	DTC	WIRE COLOR
No. 1	P0301	BRN
No. 2	P0302	RED
No. 3	P0303	BLU
No. 4	P0304	YEL
No. 5	P0305	BLK/RED
No. 6	P0306	WHT/BLU

49. Check for continuity between body ground and the appropriate PCM connector terminals (see table).

PCM CONNECTOR B (25P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	PCM TERMINAL	WIRE COLOR
No. 1	P0301	B11	BRN
No. 2	P0302	B5	RED
No. 3	P0303	B15	BLU
No. 4	P0304	B4	YEL
No. 5	P0305	B3	BLK/RED
No. 6	P0306	B6	WHT/BLU

Is there continuity?

YES – Replace the injector, then recheck. ■

NO – Repair open in the wire between the PCM and the injector. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

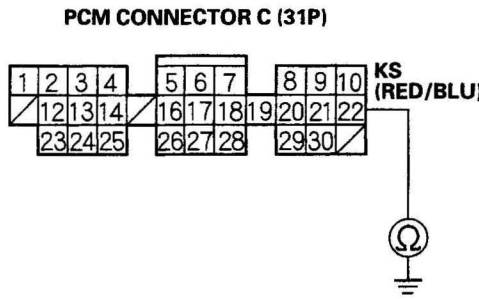
DTC P0325: Knock Sensor Circuit Malfunction

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Hold the engine at 3,000 – 4,000 rpm for at least 60 seconds.

   Is DTC P0325 indicated?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the knock sensor and the PCM.
4. Turn the ignition switch OFF.
5. Disconnect the C103 knock sensor connector.
6. Disconnect PCM connector C.
7. Check for continuity between PCM connector terminal C22 and body ground.



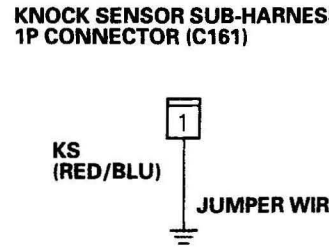
Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C22) and the C103 knock sensor connector. ■

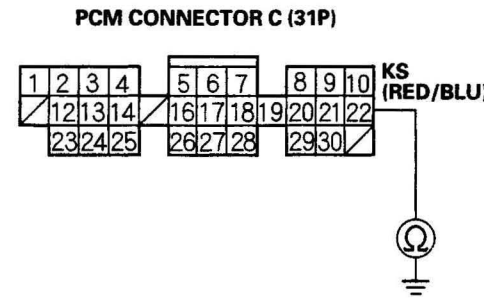
NO – Go to step 8.

8. Connect the C103 knock sensor connector terminal No. 1 to body ground with a jumper wire.



Wire side of female terminals

9. Check for continuity between PCM connector terminal C22 and body ground.



Wire side of female terminals

Is there continuity?

YES – Go to step 10.

NO – Repair open in the wire between the PCM (C22) and the C103 knock sensor connector. ■

10. Check the knock sensor sub-harness between C103 and the knock sensor for an open or short. If it's OK, substitute a known-good knock sensor and recheck.

    Is DTC P0325 indicated?

    YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

    NO – Replace the original the knock sensor and/or the knock sensor sub-harness. ■

BACK

Protected by AR

DTC P0335: CKP Sensor Circuit No Signal

DTC P0336: CKP Sensor Intermittent Interruption

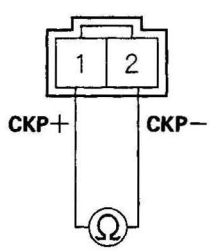
1. Reset the PCM (see page 11-4).
2. Start the engine.

   Is DTC P0335 and/or P0336 indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the CKP sensor and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the CKP sensor 2P connector.
5. Measure resistance between CKP sensor 2P connector terminals No. 1 and No. 2.

CKP SENSOR 2P CONNECTOR



Terminal side of male terminals

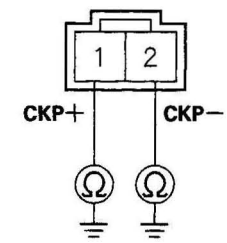
Is there 1,850–2,450 Ω ?

YES – Go to step 6.

NO – Replace the CKP sensor (see page 6-60). ■

6. Check for continuity between body ground and CKP sensor 2P connector terminals No. 1 and No. 2 individually.

CKP SENSOR 2P CONNECTOR



Terminal side of male terminals

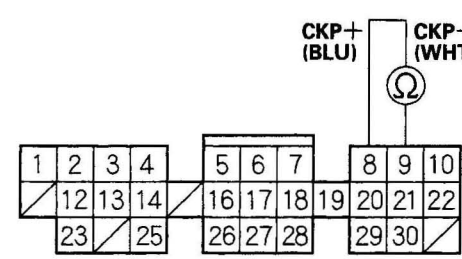
Is there continuity?

YES – Replace the CKP sensor (see page 6-60). ■

NO – Go to step 7.

7. Reconnect the CKP sensor 2P connector.
8. Disconnect the PCM connector C (31P).
9. Measure resistance between PCM connector terminals C8 and C9.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there 1,850–2,450 Ω ?

YES – Go to step 10.

NO – Repair open in the wire between the PCM (C8, C9) and CKP sensor. ■

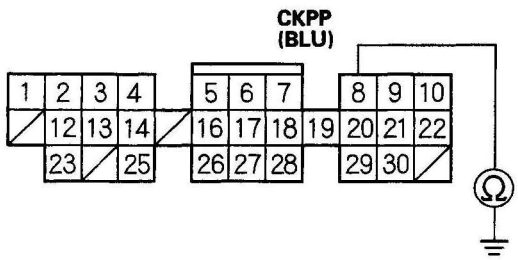
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

10. Check for continuity between body ground and PCM connector terminal C8.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (C8) and the CKP sensor. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

BACK

Protected by AR

DTC P1106: BARO Sensor Range/Perfomance Problem

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Test-drive when the transmission in 2nd (2) position gear.
4. Accelerate for 5 seconds using wide open throttle.
5. Check for a Temporary DTC with the scan tool.

   Is Temporary DTC P1106 indicated?

   YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

   NO—Intermittent failure, system is OK at this time. ■

DTC P1107: BARO Sensor Circuit Low Voltage

DTC P1108: BARO Sensor Circuit High Voltage

1. Reset the PCM (see page 11-4).
2. Turn the ignition switch ON (II).

   Is DTC P1107 or P1108 indicated?

   YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

   NO—Intermittent failure, system is OK at this time. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

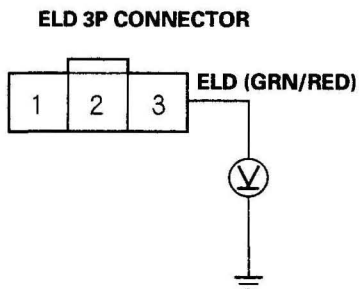
DTC P1297: ELD Circuit Low Voltage

1. Reset the PCM (see page 11-4).
2. Start the engine.
3. Turn on the headlights.

   Is DTC P1297 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ELD and the PCM. ■
4. Turn the ignition switch and the headlights OFF.
5. Disconnect the ELD 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between body ground and ELD 3P connector terminal No. 3.



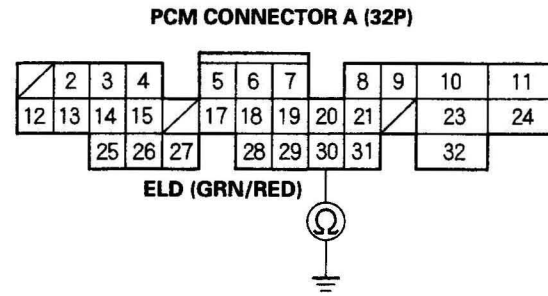
Wire side of female terminals

Is there about 5 V?

YES—Replace the ELD. ■

NO—Go to step 8.

8. Turn the ignition switch OFF.
9. Disconnect the PCM connector A (32P).
10. Check for continuity between body ground and PCM connector terminal A30.



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the PCM (A 30) and the ELD. ■

NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

BACK

Protected by AR

DTC P1298: ELD Circuit High Voltage

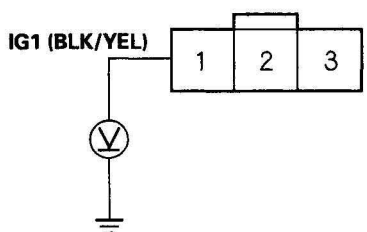
1. Reset the PCM (see page 11-4).
2. Start the engine.
3. Turn on the headlights.

   Is DTC P1298 indicated?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ELD, and the PCM.■
4. Turn the ignition switch and headlights OFF.
5. Disconnect the ELD 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between body ground and ELD 3P connector terminal No. 1.

ELD 3P CONNECTOR



Wire side of female terminals

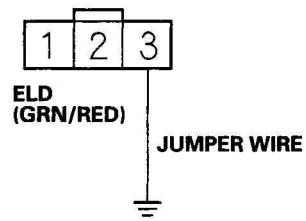
Is there battery voltage?

YES – Go to step 8.

NO – Repair open in the wire between the No. 6 ECU (PCM) CRUISE CONTROL (15 A) fuse and the ELD.■

8. Turn the ignition switch OFF.
9. Connect ELD 3P connector terminal No. 3 to body ground with a jumper wire.

ELD 3P CONNECTOR



Wire side of female terminals

10. Disconnect PCM connector A (32P).

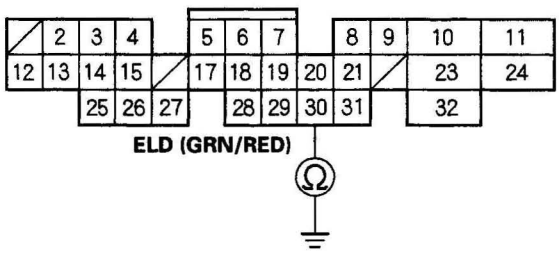
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

11. Check for continuity between body ground and PCM connector terminal A30.

PCM CONNECTOR A (32P)



Wire side of female terminals

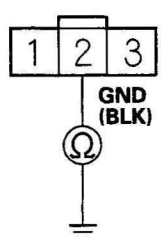
Is there continuity?

YES – Go to step 12.

NO – Repair open in the wire between the PCM (A30) and the ELD.

12. Check for continuity between ELD 3P connector terminal No. 2 and body ground.

ELD 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Go to step 10.

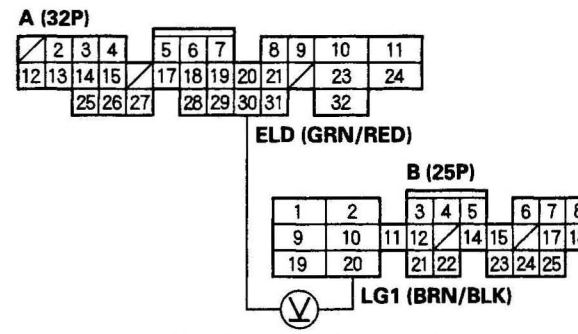
NO – Repair open in the wire between the ELD and G201.■

13. Reconnect the ELD 3P connector and PCM connector A (32P).

14. Start the engine and let it idle.

15. While measuring voltage between PCM connector terminals A30 and B20, turn the headlights on (high).

PCM CONNECTORS



Wire side of female terminals

Does the voltage drop?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

NO – Replace the ELD.■

BACK

Protected by AR

DTC P1361: CMP (TDC: '99-01 models) Sensor A Intermittent Interruption

DTC P1362: CMP (TDC: '99-01 models) Sensor A No Signal

DTC P1366: CMP (TDC: '99-01 models) Sensor B Intermittent Interruption

DTC P1367: CMP (TDC: '99-01 models) Sensor B No Signal

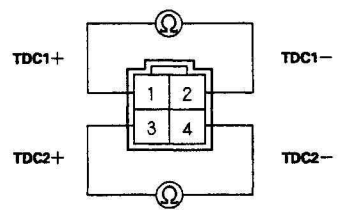
1. Reset the PCM (see page 11-4).
2. Start the engine.

   Is DTC P1361, P1362, P1366, or P1367 indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the CMP (TDC) sensor A/B and at the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the CMP (TDC) sensor A/B 4P connector.
5. Measure resistance between the terminals of the indicated sensor (see table).

CMP (TDC) SENSOR A/B 4P CONNECTOR



Terminal side of male terminals

SENSOR	DTC	SENSOR TERMINAL	PCM TERMINAL	WIRE COLOR
CMP (TDC) A	P1361	1	C20	GRN
	P1362	2	C21	RED
CMP (TDC) B	P1366	3	C29	YEL
	P1367	4	C30	BLK

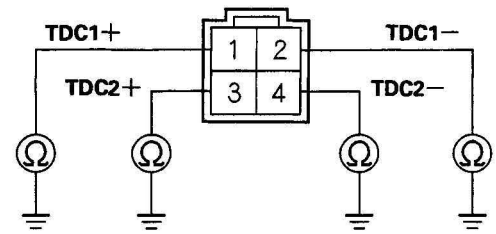
Is there 1,850–2,450 Ω ?

YES – Go to step 6.

NO – Replace CMP (TDC) sensor A/B (see page 6-59). ■

6. Check for continuity to body ground on both terminals of the indicated sensor individually.

CMP (TDC) SENSOR A/B 4P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES – Replace CMP (TDC) sensor A/B (see page 6-59). ■

NO – Go to step 7.

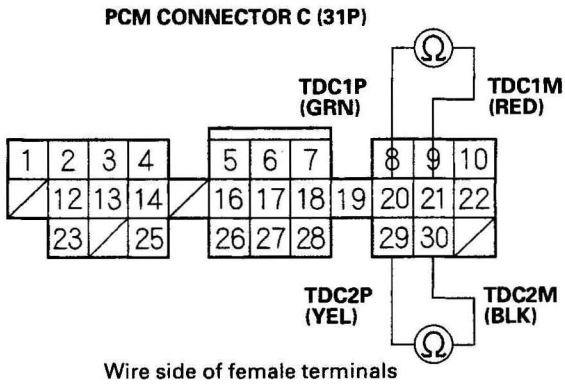
7. Reconnect the CMP (TDC) sensor A/B 4P connector.
8. Disconnect PCM connector C (31P).

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

9. Measure resistance between terminals of the indicated sensor on the PCM connector (see table).



Wire side of female terminals

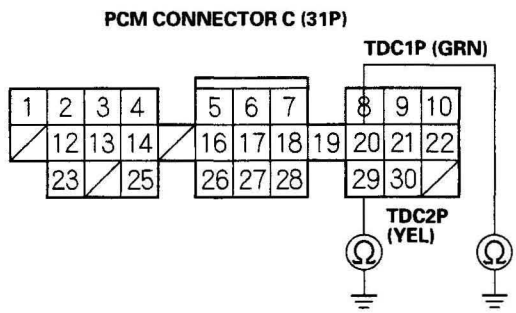
SENSOR	DTC	PCM TERMINAL	WIRE COLOR
CMP (TDC) A	P1361	C20	GRN
	P1362	C21	RED
CMP (TDC) B	P1366	C29	YEL
	P1367	C30	BLK

Is there 1,850–2,450 Ω ?

YES—Go to step 10.

NO—Repair open in the indicated sensor wires (see table).■

10. Check for continuity between body ground and PCM connector terminals C20 and/or C29 individually.



Wire side of female terminals

Is there continuity?

YES—Repair short in the indicated sensor wires.■

NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

DTC P1486: Thermostat Range/Performance Problem

NOTE: If the DTCs listed below are stored the same time as DTC P1486, troubleshoot those DTCs first, then recheck for P1486.

P0107, P0108, P1129: MAP Sensor
P1106, P1107, P1108: BARO Sensor
P1259: VTEC system
P0401: EGR Insufficient Flow
P1491: EGR Valve Insufficient Lift
P1498: EGR Valve Position Sensor High Voltage
P0116, P0117, P0118: Engine Coolant Temperature (ECT) Sensor
P0112, P0113: Intake Air Temperature (IAT) Circuit
P0335, P0336, P1359: Crankshaft Piston (CKP) Sensor
P0300: Random Misfire
P0301, P0302, P0303, P0304, P0305, P0306: Cylinder 1, 2, 3, 4, 5, or 6 Misfire Detected
P0505: Idle Control System Malfunction
P1519: Idle Air Control (IAC) Valve

DTC P1486 can set occasionally when the hood is opened.

1. Check the engine coolant level.

   Is the engine coolant level low?

   YES—Refill the engine coolant. If necessary, check the cooling system.■

   NO—Go to step 2.

2. Turn the ignition switch ON (II).

3. Check the radiator fan.

   Does the radiator fan keep running?

   YES—Check the radiator fan circuit (see page 10-22), radiator fan switch circuit (see page 10-24), and the radiator fan switch (see page 10-33).

   - If they are OK, substitute the PCM and recheck (see page 11-5).
   - If the symptom/indicator goes away, replace the original PCM.■

   NO—Test the thermostat (see page 10-11).■

BACK

Protected by AR

DTC P1676: FPTDR Signal Line Malfunction

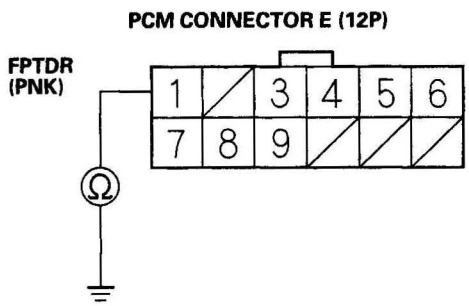
'99 model

1. Reset the PCM (see page 11-4).
2. Start the engine and wait 10 seconds.

   Is DTC P1676 indicated?

   YES – Go to step 3.

   NO – Intermittent failure system is OK at this time. Check for poor connections or loose wires at the ABS/TCS control unit and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the PCM connector E (12P) and the ABS/TCS control unit 16P connector.
5. Check for continuity between body gound and PCM connector terminal E1.



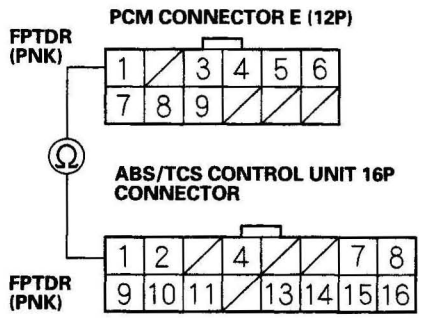
Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the ABS/TCS control unit and the PCM (E1). ■

NO – Go to step 6.

6. Check for continuity between ABS/TCS control unit 16P connector terminal No. 1 and PCM connector terminal E1.



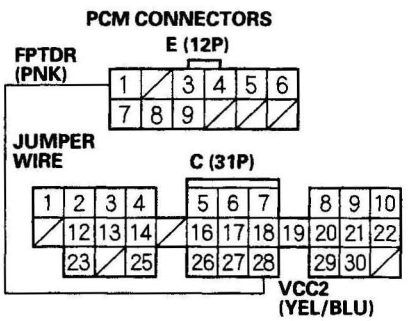
Wire side of female terminals

Is there continuity?

YES – Go to step 7.

NO – Repair open in the wire between the ABS/TCS control unit and the PCM (E1). ■

7. Reconnect the PCM connector E (12P).
8. Connect PCM connector terminals E1 and C28 with a jumper wire.



Wire side of female terminals

9. Reset the PCM (see page 11-4).
10. Start the engine and wait 60 seconds.

    Is DTC P1678 indicated?

    YES – Substitute a known-good ABS/TCS control unit and recheck. If the symptom/indication goes away, replace the original ABS/TCS control unit. ■

    NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

DTC P1676: FPTDR Signal Line Malfunction

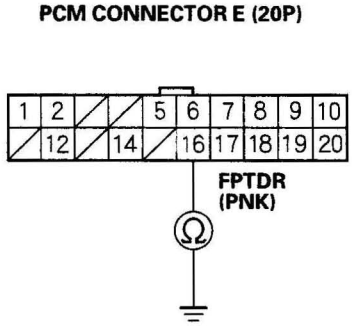
'00-03 models:

1. Reset the PCM (see page 11-4).
2. Start the engine and wait 10 seconds.

   Is DTC P1676 indicated?

   YES – Go to step 3.

   NO – Intermittent failure system is OK at this time. Check for poor connections or loose wires at the ABS/TCS control unit and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the PCM connector E (20P) and the ABS/TCS control unit 16P connector.
5. Check for continuity between body gound and PCM connector terminal E16.



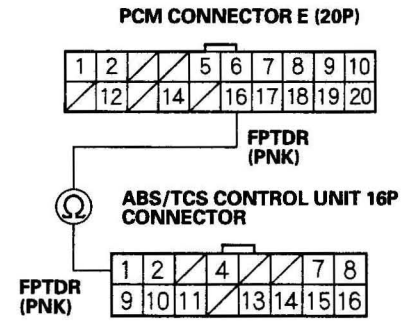
Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the ABS/TCS control unit and the PCM (E16). ■

NO – Go to step 6.

6. Check for continuity between ABS/TCS control unit 16P connector terminal No. 1 and PCM connector terminal E16.



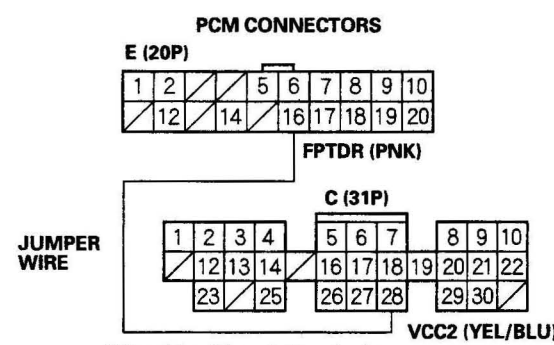
Wire side of female terminals

Is there continuity?

YES – Go to step 7.

NO – Repair open in the wire between the ABS/TCS control unit and the PCM (E16). ■

7. Reconnect the PCM connector E (20P).
8. Connect PCM connector terminals E16 and C28 with a jumper wire.



Wire side of female terminals

9. Reset the PCM (see page 11-4).
10. Start the engine and wait 60 seconds.

    Is DTC P1678 indicated?

    YES – Substitute a known-good ABS/TCS control unit and recheck. If the symptom/indication goes away, replace the original ABS/TCS control unit. ■

    NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

BACK

Protected by AR

DTC P1678: FPTDR Signal Line Malfunction

1. Reset the PCM (see page 11-4).
2. Start the engine and wait 60 seconds.

   Is DTC P1678 indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ABS/TCS control unit and the PCM.
3. Turn the ignition switch OFF.
4. Disconnect the ABS/TCS control unit 16P connector.
5. Start the engine and wait 10 seconds.

   Is DTC P1678 indicated?

   YES – Substitute a known-good ABS/TCS control unit and recheck. If the symptom/indication goes away, replace the original ABS/TCS control unit. ■

   NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

DTC P1607: PCM Internal Circuit Malfunction

1. Reset the PCM (see page 11-4).
2. Turn the ignition switch ON (II).
3. Wait 30 seconds.

   Is DTC P1607 indicated?

   YES – Substitute a known-good PCM and recheck (see page 11-3). If the symptom/indication goes away, replace the original PCM. ■

   NO – Go to step 4.
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON (II).
6. Wait 10 seconds.

   Is DTC P1607 indicated?

   YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

   NO – Intermittent failure, system is OK at this time. ■

Protected by AR

MIL Circuit Troubleshooting

1. Turn the ignition switch ON (II) and watch the Malfunction Indicator Lamp (MIL).

   Does the MIL come on and stay on for more than 20 seconds after turning the ignition switch ON (II)?

   YES – If the MIL always come on and stays on, go to step 20. But if the MIL sometimes works normally, first check for these problems. ■

   - An intermittent short in the wire between the PCM (A10) and the Data Link Connector (DLC).
   - An intermittent open in the wire between the PCM (A21) and the DLC.
   - An intermittent short in the wire between the PCM (A18) and the gauge assembly.

   NO – If the MIL is always off, go to step 2. But if the MIL sometimes works normally, first check for these problems. ■

   - A loose No. 9 BACK UP LIGHT, INSTRUMENT LIGHT (7.5A) fuse in the driver's under-dash fuse/relay box.
   - A loose ACG S (15A) fuse in the under-hood fuse/relay box.
   - A loose No. 1 FUEL PUMP (15A) fuse in the driver's under-dash fuse/relay box.
   - A poor connection at PCM terminal A18.
   - An intermittent open in the GRN/ORN wire between the PCM (A18) and the gauge assembly.
   - An intermittent short in the wire between the PCM (C19), the manifold absolute pressure (MAP) sensor, and the countershaft speed sensor.
   - An intermittent short in the wire between the PCM (C28), the throttle position (TP) sensor, exhaust gas recirculation (EGR) valve position sensor, fuel tank pressure (FTP) sensor, and the mainshaft speed sensor.

2. Turn the ignition switch OFF and then ON (II) again.

   Is the low oil pressure indicator light on?

   YES – Go to step 3.

   NO – Check for these problems. ■

   - A blown No. 9 BACK UP LIGHT, INSTRUMENT LIGHT (7.5A) fuse in the driver's under-dash fuse/relay box.
   - A short or open in the wire between No. 9 BACK UP LIGHT, INSTRUMENT LIGHT (7.5A) fuse and the gauge assembly.

3. Try to start the engine.

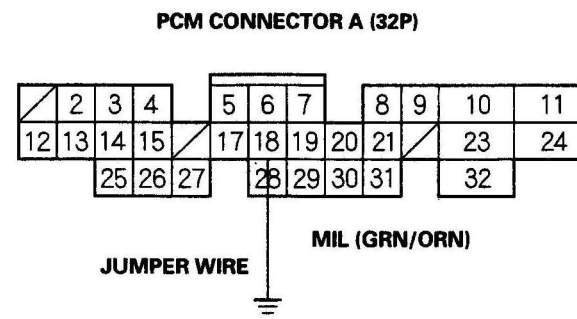
   Does the engine start?

   YES – Go to step 4.

   NO – Go to step 7.

4. Turn the ignition switch OFF.

5. Connect PCM connector terminal A18 and body ground with a jumper wire.



6. Turn the ignition switch ON (II).

   Is the MIL on?

   YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

   NO – Check for an open in the wires between the PCM (A18) and the gauge assembly. Also check for a blown MIL bulb. ■

BACK

Protected by AR

7. Turn the ignition switch OFF.

8. Inspect the ACG S (15A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES – Go to step 9.

   NO – Check for these problems. ■

   - A short in the wire between the ACG S (15A) fuse and the PGM-FI main relay.
   - A short in the wire between the PGM-FI main relay and the PCM, injectors, or IAC valve.
   - A blown ACG S (15A) fuse in the driver's under-dash fuse/relay box.

9. Inspect the No. 1 FUEL PUMP (15A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

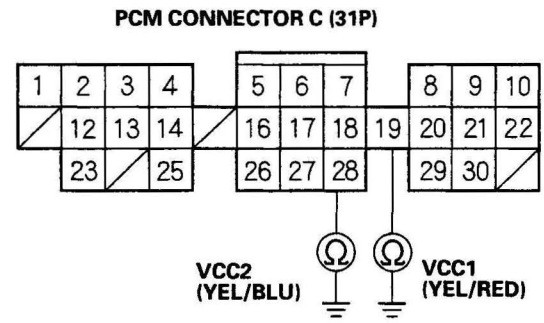
   YES – Go to step 10.

   NO – Check for these problems. ■

   - A blown the No. 1 FUEL PUMP (15A) fuse in the driver's under-dash fuse/relay box.
   - A short in the wire between the No. 1 FUEL PUMP (15A) fuse and the PGM-FI main relay.
   - A short in the wire between the PGM-FI main relay and the fuel pump.
   - A faulty PGM-FI main relay or faulty pump.

10. Disconnect PCM connector C (31P).

11. Check for continuity between body ground and PCM connector terminals C19 and C28 individually.



Wire side of female terminals

   Is there continuity?

   YES – Go to step 12.

   NO – Go to step 13.

12. Disconnect the 3P connector from each of these sensors, one at a time, and check for continuity between body ground and PCM connector terminal C19 and C28 individually.

    - Manifold Absolute Pressure (MAP) sensor
    - Exhaust Gas Recirculation (EGR) valve position sensor
    - Fuel Tank Pressure (FTP) sensor
    - Throttle Position (TP) sensor
    - Mainshaft speed sensor
    - Countershaft speed sensor

    Is there continuity?

    YES – Repair short to body ground in the wire between the PCM (C19) and the MAP sensor or countershaft speed sensor, or the PCM (C28) and the TP sensor, EGR valve position sensor, FTP sensor, or mainshaft speed sensor. ■

    NO – Replace the sensor that made continuity to body ground go away when disconnected. ■

13. Disconnect the injectors and idle air control (IAC) valve connectors.

(cont'd)

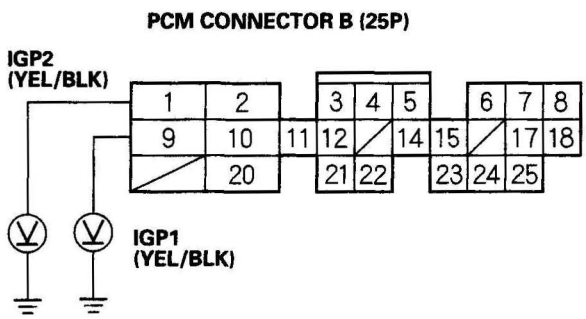
BACK

Protected by AR

MIL Circuit Troubleshooting (cont'd)

14. Turn the ignition switch ON (II).

15. Measure voltage between body ground and PCM connector terminals B1 and B9 individually.



Wire side of female terminals

Is there battery voltage?

YES – Go to step 16.

NO – Check for these problems:

- An open in the wire(s) between the PGM-FI main relay and PCM connector terminals B1 and B9.
- Poor connections at the PGM-FI main relay.
- A faulty PGM-FI main relay (see page 11-160).

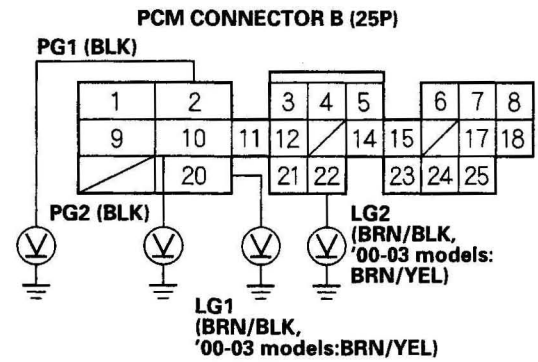
If necessary, repair or replace the faulty part.■

16. Turn the ignition switch OFF.

17. Reconnect the connectors to the sensors, then reconnect PCM connector C (31P).

18. Turn the ignition switch ON (II).

19. Measure voltage between body ground and PCM connector terminals B2, B10, B20, and B22 individually.



Wire side of female terminals

Is there less than 1.0 V?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

NO – Repair open in the wire(s) that had more than 1.0 V between G101 and the PCM (B2, B10, B20, B22).■

20. Turn the ignition switch OFF.

21. Connect an OBD II scan tool/Honda PGM Tester (see page 11-3).

22. Turn the ignition switch ON (II).

23. Read the OBD II scan tool/Honda PGM Tester.

Does the OBD II scan tool/Honda PGM Tester communicate with the PCM?

YES – Go to step 24.

NO – Go to DLC Circuit Troubleshooting (see page 11-140).

BACK

Protected by AR

24. Check the OBD scan tool/Honda PGM Tester for DTCs.

    Are any DTCs indicated?

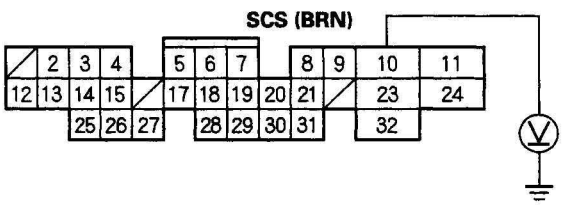
    YES—Go to the DTC Troubleshooting Index.

    NO—Go to step 26.

25. Turn the ignition switch OFF, then turn it back ON (II).

26. Measure voltage between PCM connector terminal A10 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there about 5 V (or battery voltage)?

YES—Go to step 27.

NO—Repair short in the wire between the DLC and the PCM (A10).■

27. Turn the ignition switch OFF.

28. Disconnect PCM connector A (32P).

29. Turn the ignition switch ON (II).

    Is the MIL on?

    YES—Repair short in the wire between the gauge assembly and the PCM (A18).■

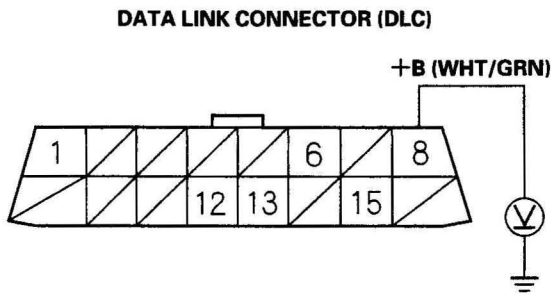
    NO—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

Protected by AR

DLC Circuit Troubleshooting

If the ECM/PCM does not communicate with the OBD II scan tool or Honda PGM Tester, do this troubleshooting procedure.

1. Measure voltage between DLC terminal No. 8 and body ground.



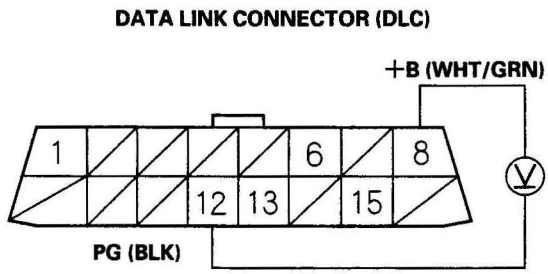
Wire side of female terminals

Is there battery voltage?

YES – Go to step 2.

NO – Repair open in the wire between DLC terminal No. 8 and the No. 13 BACK UP (7.5A) fuse in the passenger's under-dash fuse/relay box. ■

2. Measure voltage between DLC terminals No. 8 and No. 12.



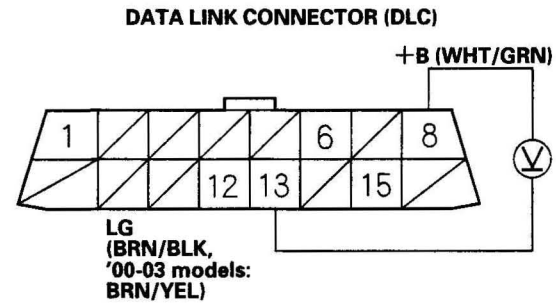
Wire side of female terminals

Is there battery voltage?

YES – Go to step 3.

NO – Repair open in the wire between DLC terminal No. 12 and body ground. ■

3. Measure voltage between DLC terminals No. 8 and No. 13.



Wire side of female terminals

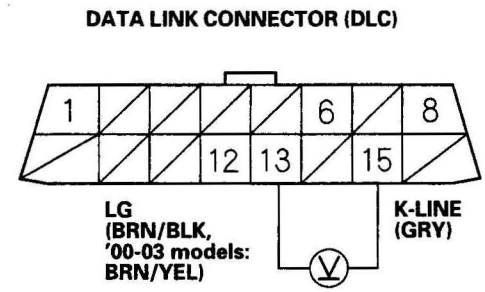
Is there battery voltage?

YES – Go to step 4.

NO – Repair open in the wire between DLC terminal No. 13 and the PCM (A23, A24). ■

4. Turn the ignition switch ON (II).

5. Measure voltage between DLC terminals No. 13 and No. 15.



Wire side of female terminals

Is there 8.5 V or more?

YES – Go to step 11.

NO – Go to step 6.

6. Turn the ignition switch OFF.

7. Disconnect the negative cable from the battery.

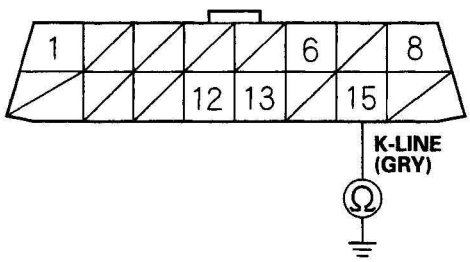
BACK

Protected by AR

8. Disconnect PCM connector A (32P). Make sure the OBD II scan tool or Honda PGM Tester is disconnected from the DLC.

9. Check for continuity between DLC terminal No. 15 and body ground.

DATA LINK CONNECTOR (DLC)



Wire side of female terminals

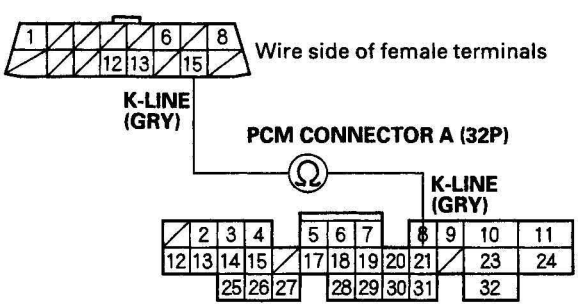
Is there continuity?

YES – Repair short to ground in the wire between DLC terminal No. 15 and the PCM (A21). After repairing the wire, check the DTC with the OBD II scan tool/Honda PGM Tester, and go to the DTC Troubleshooting Index.■

NO – Go to step 10.

10. Check for continuity between DLC terminal No. 15 and PCM terminal A21.

DATA LINK CONNECTOR (DLC)



Wire side of female terminals

Is there continuity?

YES – Update the PCM if it does not have the latest software, or substitute a known-good PCM, then recheck (see page 11-5). If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

NO – Repair open in the wire between DLC terminal No. 15 and the PCM (A21). After repairing the wire, check the DTC with the OBD II scan tool/Honda PGM Tester, and go to the DTC Troubleshooting Index.■

11. Turn the ignition switch OFF.

12. Disconnect the negative cable from the battery.

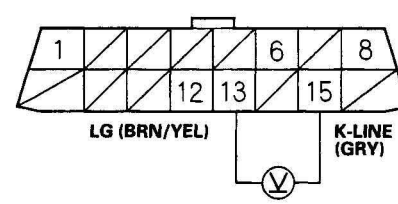
13. Disconnect PCM connector A (32P). Make sure the OBD II scan tool or Honda PGM Tester is disconnected from the DLC.

14. Reconnect the negative cable to the battery.

15. Turn the ignition switch ON (II).

16. Measure voltage between DLC terminals No. 13 and No. 15.

DATA LINK CONNECTOR (DLC)



Wire side of female terminals

Is there 0 V?

YES – Update the PCM if it does not have the latest software, or substitute a known-good PCM, then recheck (see page 11-5). If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

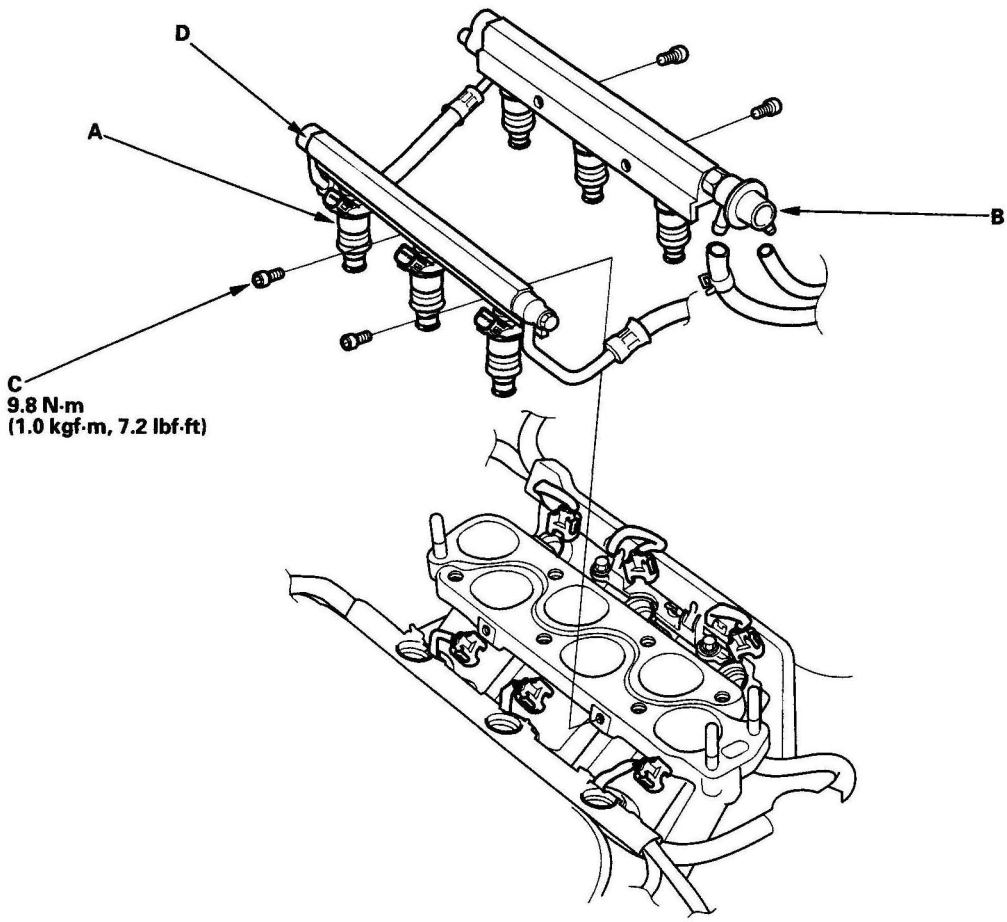
NO – Repair short to power in the wire between the DLC terminal No. 15 and the PCM (A21). After repairing the wire, check the DTC with the OBD II scan tool/Honda PGM Tester, and go to the DTC Troubleshooting Index.■

Protected by AR

Injector Replacement

'99 model:

1. Relieve fuel pressure (see page 11-163).
2. Remove the intake manifold covers (see page 5-2) and the intake manifold (see page 9-2).
3. Disconnect the connectors from the injectors (A).

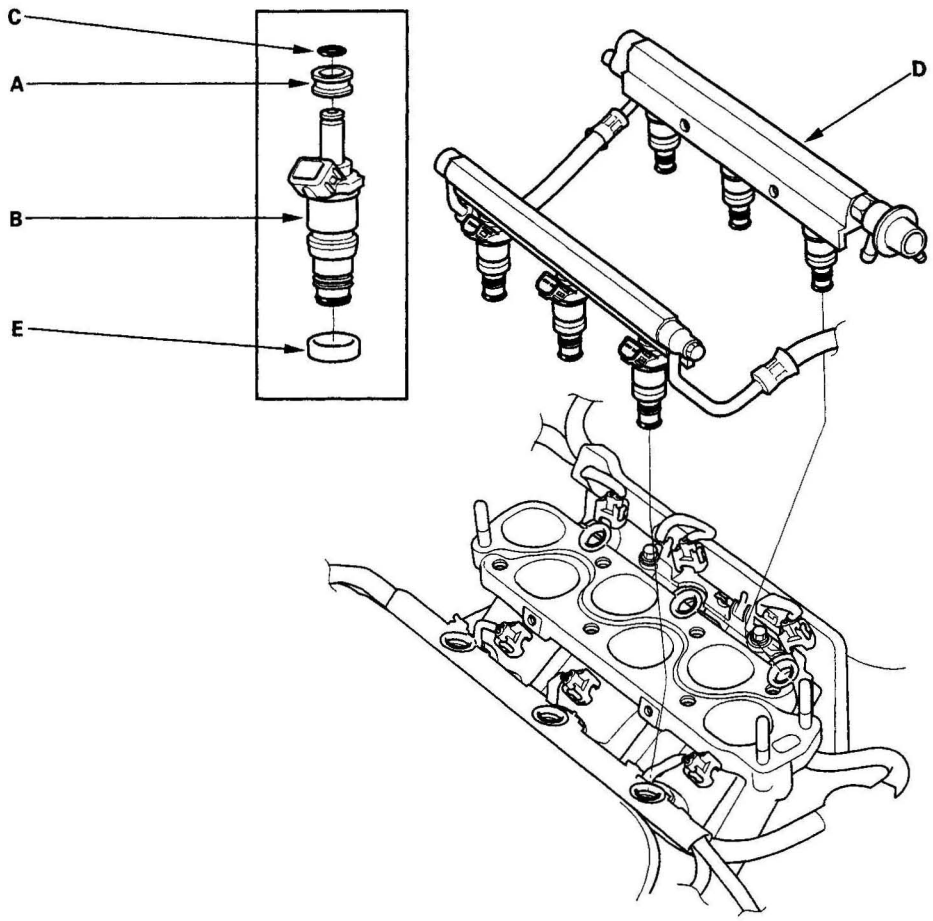


4. Disconnect the vacuum hose and fuel return hose from the fuel pressure regulator (B). Place a rag or a shop towel over the hoses before disconnecting them.
5. Remove the fuel rail bolts (C) from the fuel rail (D).
6. Remove the fuel rail.
7. Remove the injectors from the fuel rails.

BACK

Protected by AR

8. Slide new cushion rings (A) onto the injectors (B).



9. Coat the new O-rings (C) with clean engine oil, and put them on the injectors.
10. Insert the injectors into the fuel rail (D) first.
11. Coat new seal rings (E) with clean engine oil, and press them into the intake manifold.
12. Install the fuel rail in the intake manifold.
13. Install and tighten the bolts.
14. Connect the vacuum hose and fuel return hose to the fuel pressure regulator.
15. Install the connectors on the injectors.
16. Install the intake manifold and the intake manifold cover.
17. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for about 2 seconds, the fuel pressure in the fuel line rises. Repeat this 2 or 3 times, then check for fuel leakage.

BACK

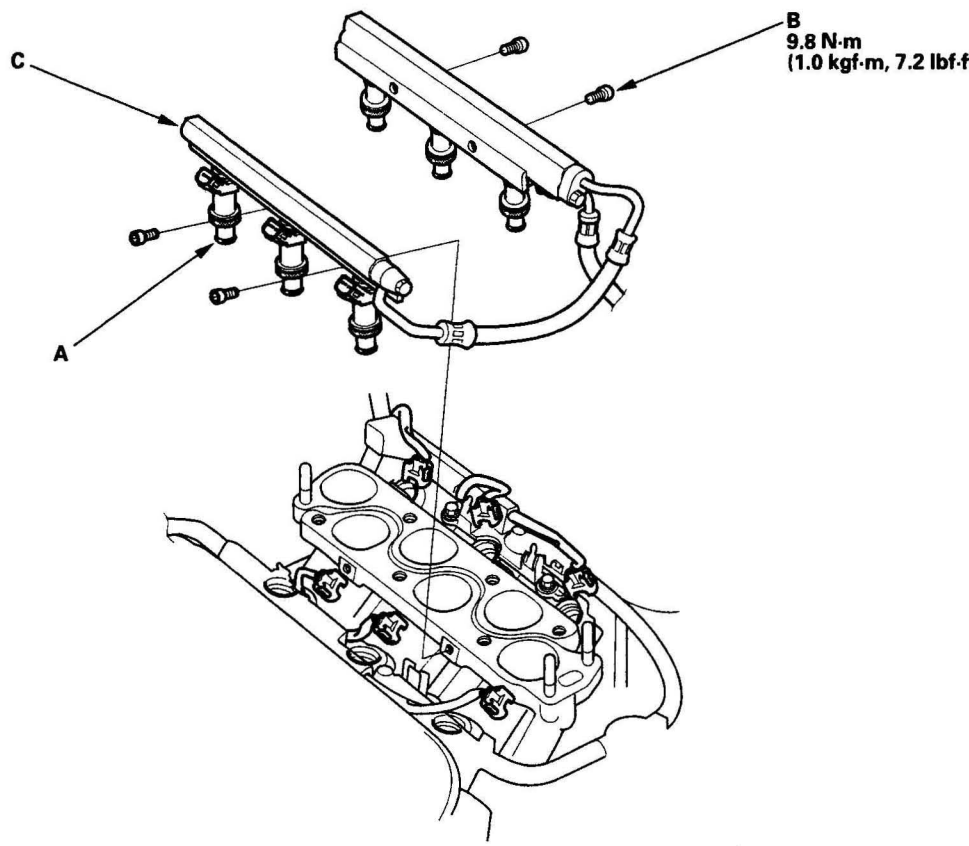
Protected by AR

Injector Replacement (cont'd)

'00-03 models:

1. Relieve fuel pressure (see page 11-163).
2. J32A2 engine: Remove the VSA-TCS control valve assembly (see page 19-190).
3. Remove the intake manifold covers (see page 5-2) and the intake manifold (see page 9-2).
4. Disconnect the connectors from the injectors (A).

   NOTE: The illustration shows the J32A2 engine.

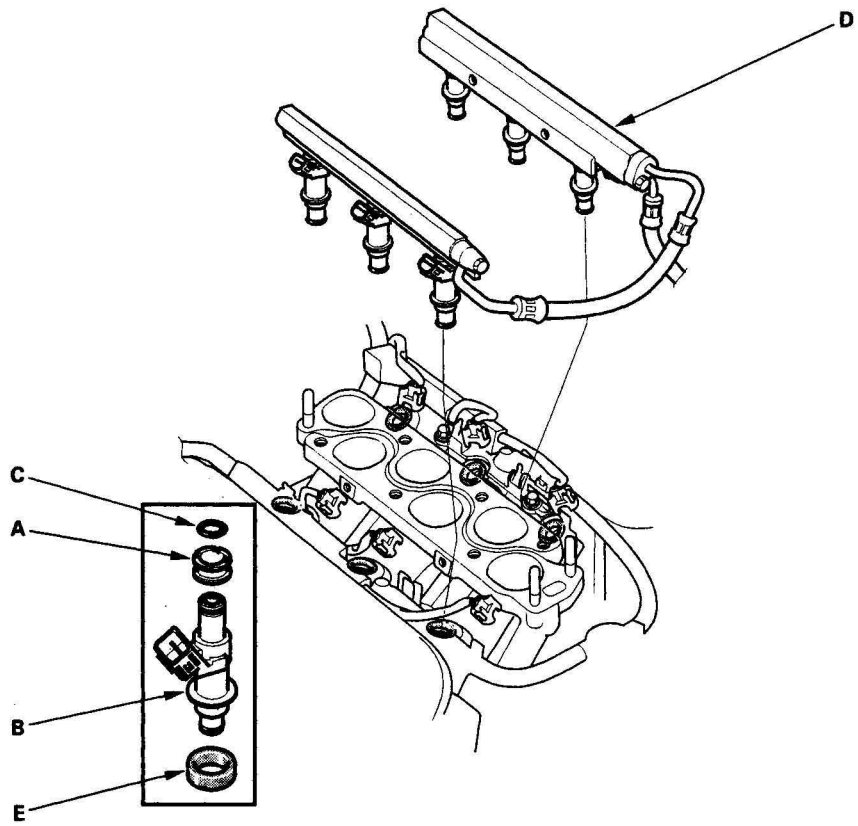


5. Remove the fuel rail mounting bolts (B) from the fuel rail (C).
6. Remove the fuel rails.
7. Remove the injectors from the fuel rails.

BACK

Protected by AR

8. Slide new cushion rings (A) onto the injectors (B).



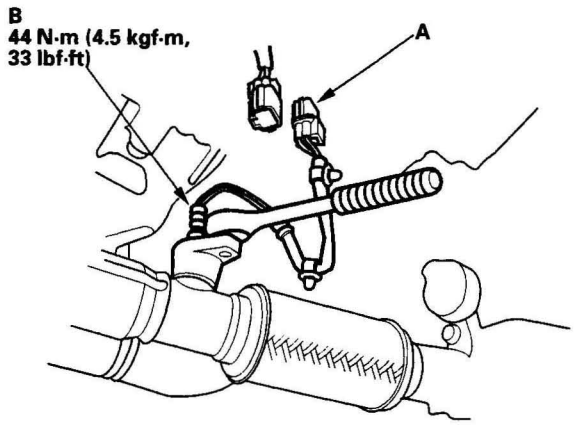
9. Coat the new O-rings (C) with clean engine oil, and put them on the injectors.
10. Insert the injectors into the fuel rails (D).
11. Coat new seal rings (E) with clean engine oil, and press them into the intake manifold.
12. Install the fuel rails.
13. Install the fuel rail mounting bolts.
14. Install the connectors on the injectors.
15. Install the intake manifold and the intake manifold cover.
16. J32A2 engine: Install the VSA-TCS control valve assembly.
17. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for approximately 2 seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check for fuel leakage.

Protected by AR

Primary HO2S Replacement

Special Tools Required
O2 sensor wrench, Snap-on YA8875, SP Tools 93750, or equivalent, commercially available

1. Disconnect the primary HO2S 4P connector (A), then remove the primary HO2S (B).



2. Install the primary HO2S in the reverse order of removal.

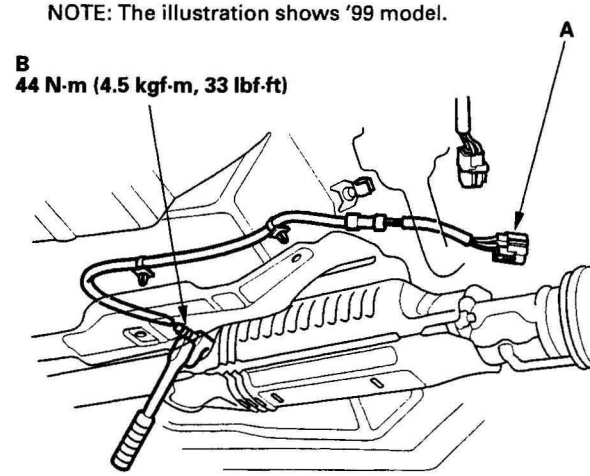
Secondary HO2S Replacement

Special Tools Required
O2 sensor wrench, Snap-on YA8875, SP Tools 93750, or equivalent, commercially available

1. Disconnect the secondary HO2S 4P connector (A), then remove the secondary HO2S (B).

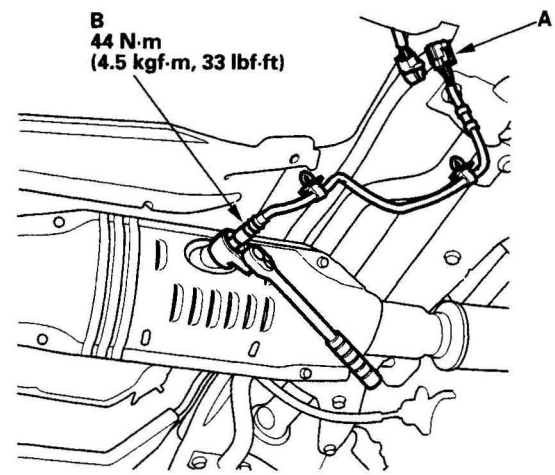
'99-01 models:

NOTE: The illustration shows '99 model.



'02-03 models:

NOTE: The illustration shows the J32A2 engine.



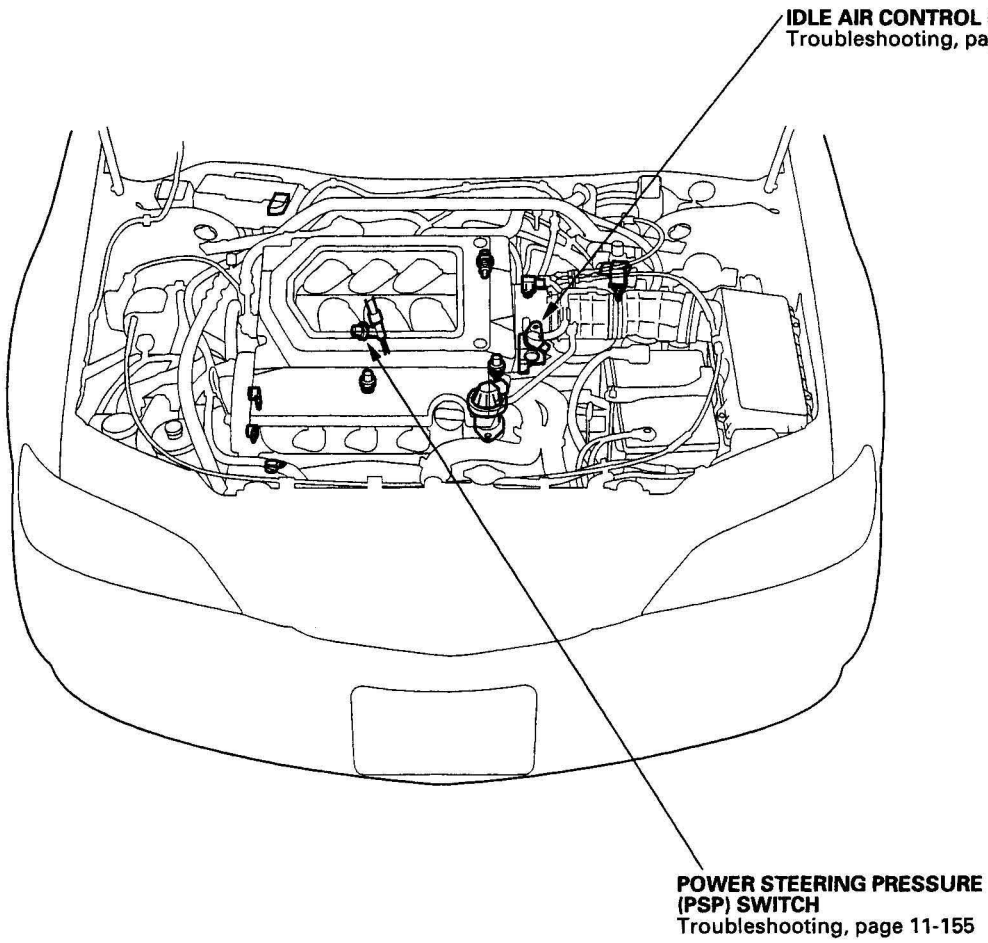
2. Install the secondary HO2S in the reverse order of removal.

BACK

Protected by AR

Component Location Index

NOTE: The illustration shows the J32A1 engine ('00-03 models) .



Protected by AR

DTC Troubleshooting

DTC P0505: Idle Control System Malfunction

NOTE: If DTC P1519 is stored at same time as DTC P0505, troubleshoot DTC P1519 first, then recheck for DTC P0505.

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check the engine speed at idle with no-load conditions: headlights, blower fan, rear window defogger, radiator fan, and air conditioner off.

   Is the engine running at 680± 50 rpm ('99-01 models) or 750± 50 rpm ('02-03 models)?

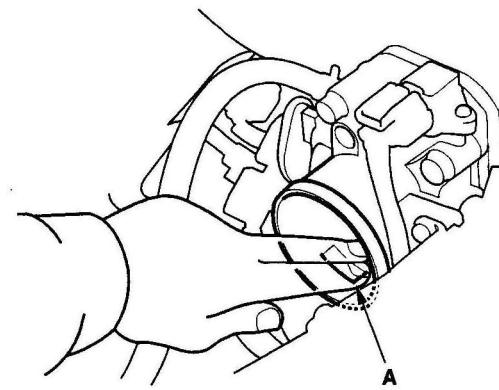
   YES—Intermittent failure, system is OK at this time.■

   NO—If the idle speed is less than 630 rpm ('99-01 models) or 700 rpm ('02-03 models), go to step 3; if it's 730 rpm or higher ('99-01 models), or 800 rpm or higher ('02-03 models), go to step 4.
3. Disconnect the Idle Air Control (IAC) valve 3P connector.

   Dose the engine speed increase or fluctuate?

   YES—Adjust the (base) idle speed (see page 11-157). If you cannot adjust the base idle, clean the ports in the throttle body ports.■

   NO—Replace the IAC valve.■
4. Turn the ignition switch OFF.
5. J32A2 engine: Remove the VSA-TCS control valve assembly (see page 19-190).
6. Remove the intake air duct from the throttle body.
7. Start the engine and let it idle.
8. Put your finger on the lower port (A) in the throttle body.



Does the engine speed drop?

YES—Adjust the idle speed (see page 11-157). If you cannot adjust the idle, replace the IAC valve.■

NO—Make sure the throttle valve is completely closed, and check for vacuum leaks. Repair as necessary.■

BACK

Protected by AR

DTC P1519: IAC Valve Circuit Malfunction

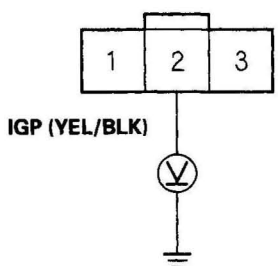
1. Reset the PCM (see page 11-4).
2. Turn the ignition switch ON (II).

   Is DTC P1519 indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IAC valve and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the IAC valve 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between IAC valve 3P connector terminal No. 2 and body ground.

IAC VALVE 3P CONNECTOR



Wire side of female terminals

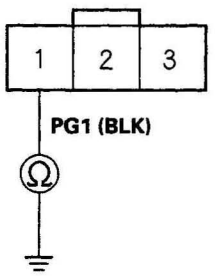
Is there battery voltage?

YES – Go to step 7.

NO – Repair open in the wire between the IAC valve and the PGM-FI main relay. ■

7. Turn the ignition switch OFF.
8. Check for continuity between body ground and IAC valve 3P connector terminal No. 1.

IAC VALVE 3P CONNECTOR



Wire side of female terminals

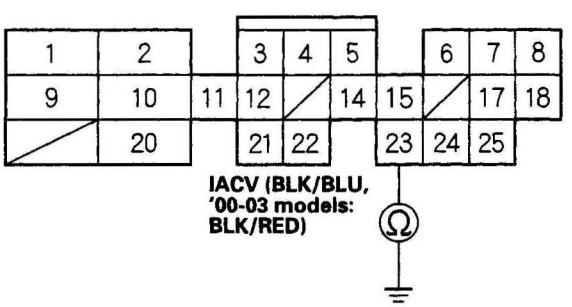
Is there continuity?

YES – Go to step 9.

NO – Repair open in the wire between the IAC valve and G101. ■

9. Disconnect PCM connector B (25P).
10. Check for continuity between body ground and PCM connector terminal B23.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the IAC valve and the PCM (B23). ■

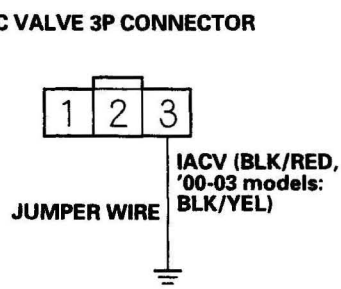
NO – Go to step 11.

(cont'd)

Protected by AR

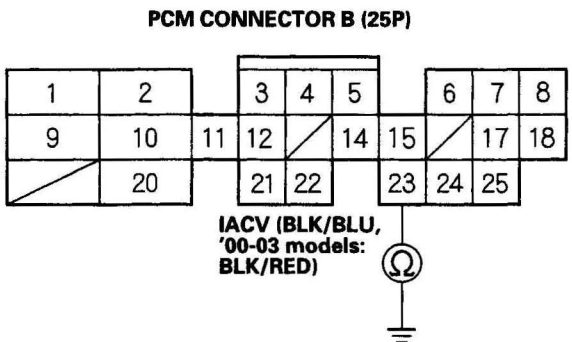
DTC Troubleshooting (cont'd)

11. Connect IAC valve 3P connector terminal No. 3 to body ground with a jumper wire.



Wire side of female terminals

12. Check for continuity between PCM connector terminal B23 and body ground.



Wire side of female terminals

Is there continuity?

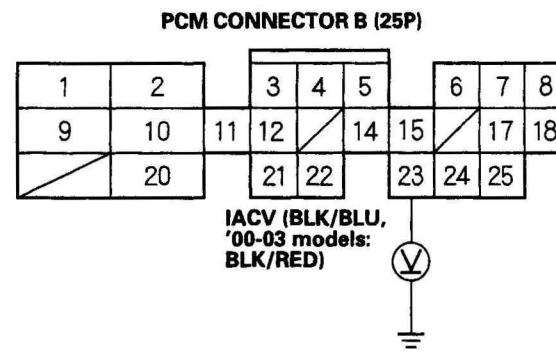
YES—Go to step 13.

NO—Repair open in the wire between the IAC valve and the PCM (B23).■

13. Remove the jumper wire from the IAC valve 3P connector, then reconnect the IAC valve 3P connector.

14. Turn the ignition switch ON (II).

15. Measure voltage between body ground and PCM connector terminal B23.



Wire side of female terminals

Is there battery voltage?

YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

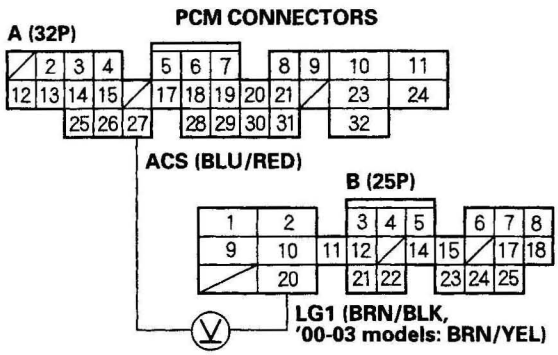
NO—Replace the IAC valve.■

BACK

Protected by AR

A/C Signal Circuit Troubleshooting

1. Turn the ignition switch OFF.
2. Disconnect the A/C pressure switch 2P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between PCM connector terminals A27 and B20.



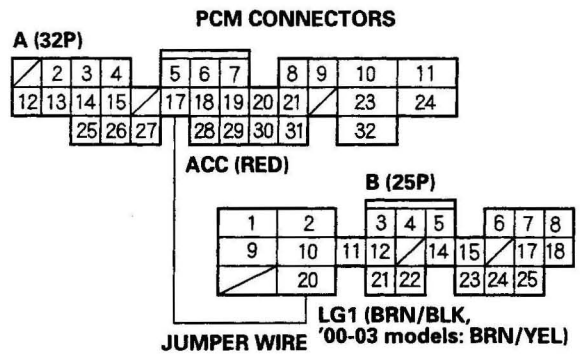
Wire side of female terminals

Is there approx. 5 V?

YES – Go to step 5.

NO – Go to step 12.

5. Turn the ignition switch OFF.
6. Reconnect the A/C pressure switch 2P connector.
7. Turn the ignition switch ON (II).
8. Momentarily connect PCM connector terminals A17 and B20 with a jumper wire several times.



Wire side of female terminals

Is there a clicking noise from the A/C compressor clutch?

YES – Go to step 9.

NO – Go to step 15.

9. Start the engine.
10. Turn the blower switch ON.
11. Turn the A/C switch ON.

Does the A/C operate?

YES – The air conditioning signal is OK. ■

NO – Go to step 16.

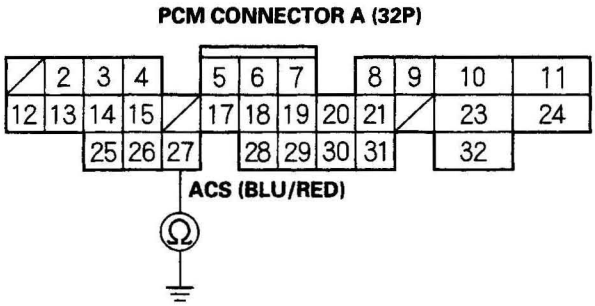
12. Turn the ignition switch OFF.
13. Disconnect the PCM connector A (32P)

(cont'd)

Protected by AR

A/C Signal Circuit Troubleshooting (cont'd)

14. Check for continuity between body ground and PCM connector terminal A27.



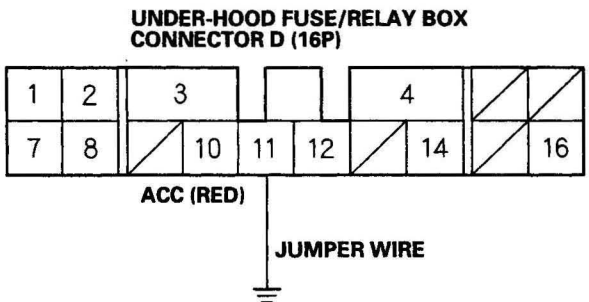
Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between PCM (A27) and the A/C pressure switch. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If prescribed voltage is now available, replace the original PCM. If not, check the A/C system for other symptoms. ■

15. Momentarily connect under-hood fuse/relay box 16P connector terminal No. 11 to body ground with a jumper wire several times.



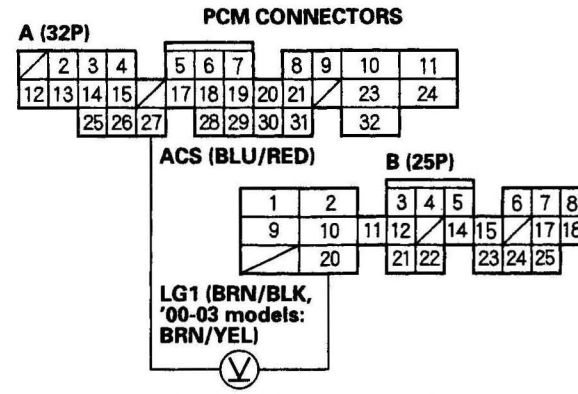
Wire side of female terminals

Is there a clicking noise from the A/C compressor clutch?

YES – Repair open in the wire between the PCM (A17) and the A/C clutch relay. ■

NO – Check the A/C system for other symptoms. ■

16. Measure voltage between PCM connector terminal A27 and B20.



Wire side of female terminals

Is there less than 1.0 V?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. If not, inspect the air conditioning system. ■

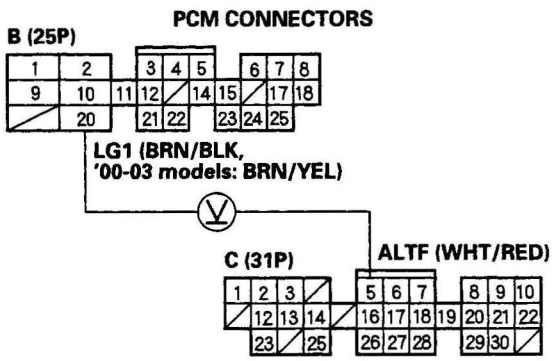
NO – Repair open in the wire between the PCM (A27) and the A/C pressure switch. ■

BACK

Protected by AR

Alternator FR Signal Circuit Troubleshooting

1. Disconnect the ALT 4P connector.
2. Turn the ignition switch ON (II).
3. Measure voltage between PCM connector terminals B20 and C5.



Wire side of female terminals

Is there approx. 5 V?

YES – Go to step 4.

NO – Go to step 14.

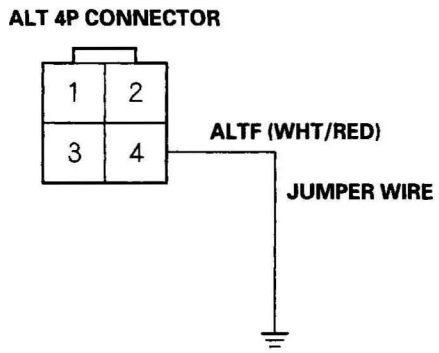
4. Turn the ignition switch OFF.
5. Reconnect the ALT 4P connector.
6. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
7. Measure voltage between PCM connector terminals B20 and C5.

Does the voltage decrease when the headlights and rear window defogger are turned on?

YES – The ALT FR signal is OK. ■

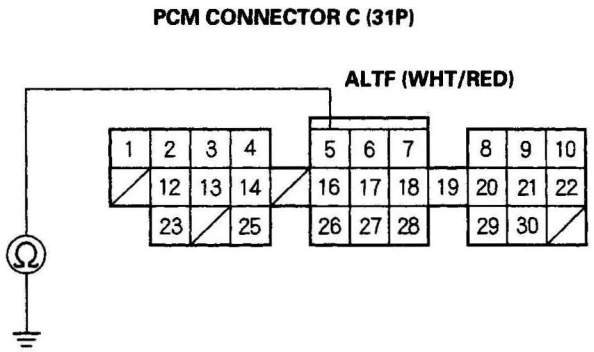
NO – Go to step 8.

8. Turn the ignition switch OFF.
9. Disconnect the negative cable from the battery.
10. Disconnect the PCM connector C (31P).
11. Disconnect the ALT 4P connector.
12. Connect ALT 4P connector terminal No. 4 to body ground with a jumper wire.



Wire side of female terminals

13. Check for continuity between body ground and PCM connector terminal C5.



Wire side of female terminals

Is there continuity?

YES – Test the ALT (see step 1 on page 4-21). ■

NO – Repair open in the wire between the PCM (C5) and the ALT. ■

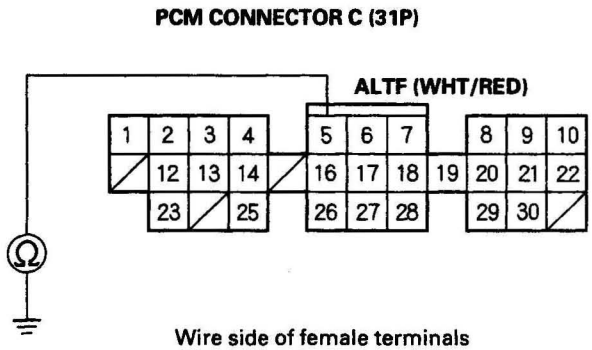
14. Turn the ignition switch OFF.
15. Disconnect the negative cable from the battery.
16. Disconnect the PCM connector C (31P).

(cont'd)

Protected by AR

Alternator FR Signal Circuit Troubleshooting (cont'd)

17. Check for continuity between body ground and PCM connector terminal C5.



Is there continuity?

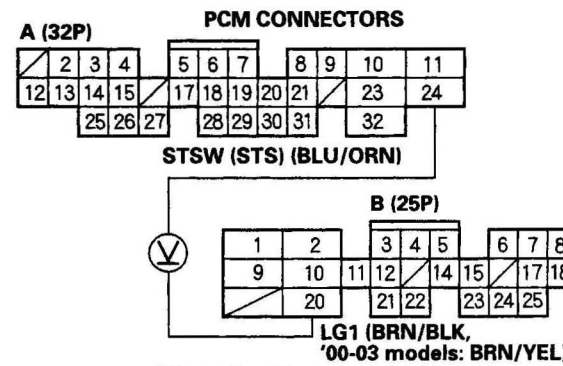
YES—Repair short in the wire between the PCM (C5) and the ALT. ■

NO—Substitute a known-good PCM and recheck (see page 11-5). If voltage is normal, replace the original PCM. ■

Starter Switch Signal Circuit Troubleshooting

NOTE: Transmission in Park or neutral

1. Measure voltage between PCM connector terminals A24 and B20 with the ignition switch in the START (III) position.



Is there battery voltage?

YES—The starter switch signal is OK. ■

NO—Go to step 2.

2. Inspect the No. 13 STARTER SIGNAL (7.5A) fuse in the driver's under-dash fuse/relay box.

Is the fuse OK?

YES—Repair open in the wire between the PCM (A24) and the No. 13 STARTER SIGNAL (7.5A) fuse. ■

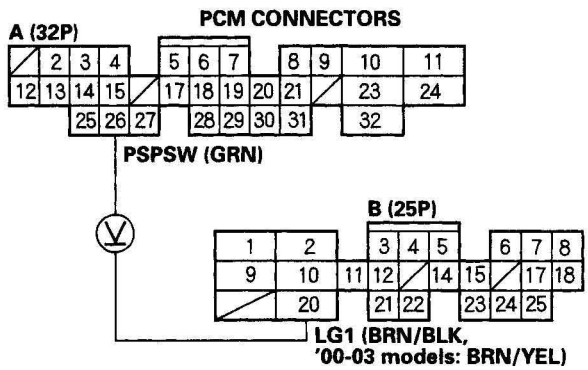
NO—Repair short in the wire between the PCM (A24) and the No. 13 STARTER SIGNAL (7.5A) fuse or the PGM-FI main relay. Replace the No. 13 STARTER SIGNAL (7.5A) fuse. ■

BACK

Protected by AR

PSP Switch Signal Circuit Troubleshooting

1. Turn the ignition switch ON (II).
2. Measure voltage between PCM connector terminals A26 and B20.



Wire side of female terminals

Is there less than 1.0 V?

YES – Go to step 3.

NO – Go to step 6.

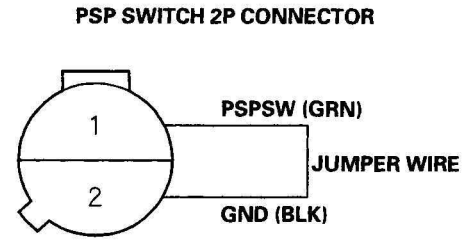
3. Start the engine.
4. Turn the steering wheel to full lock position.
5. Measure voltage between PCM connector terminals A26 and B20.

Is there battery voltage?

YES – The PSP switch signal is OK. ■

NO – Go to step 11.

6. Turn the ignition switch OFF.
7. Disconnect the PSP switch 2P connector.
8. Turn the ignition switch ON (II).
9. At the harness side, connect PSP switch 2P connector terminals No. 1 and No. 2 with a jumper wire.



Wire side of female terminals

10. Measure voltage between PCM connector terminals A26 and B20.

Is there less than 1.0 V?

YES – Replace the PSP switch. ■

NO – Check for these problems:

- An open in the wire between the PCM (A26) and the PSP switch.
- An open in wire between the PSP switch and G201. ■

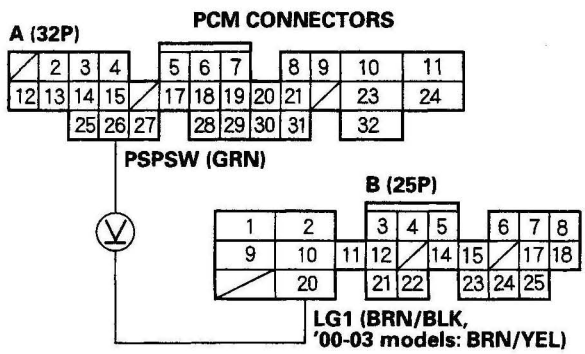
11. Turn the ignition switch OFF.
12. Disconnect the PSP switch 2P connector.
13. Turn the ignition switch ON (II).

(cont'd)

Protected by AR

PSP Switch Signal Circuit Troubleshooting (cont'd)

14. Measure voltage between PCM connector terminals A26 and B20.



Wire side of female terminals

Is there battery voltage?

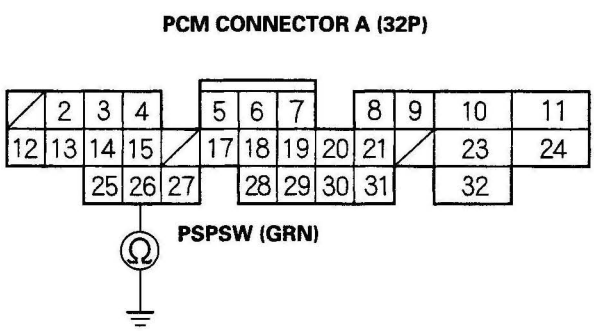
YES – Replace the PSP switch. ■

NO – Go to step 15.

15. Turn the ignition switch OFF.

16. Disconnect PCM connector A (32P).

17. Check for continuity between body ground and PCM connector terminal A26.



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the PCM (A26) and the PSP switch. ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If voltage is normal, replace the original PCM. ■

Brake Pedal Position Switch Signal Circuit Troubleshooting

1. Check the brake lights.

Are the brake lights on without pressing the brake pedal?

YES – Inspect the brake pedal position switch (see page 19-10).

NO – Go to step 2.

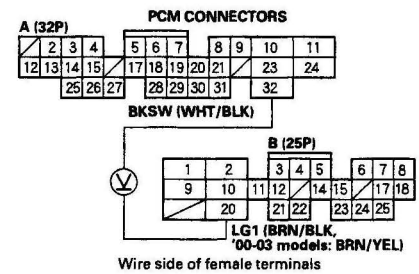
2. Press the brake pedal.

Do the brake lights come on?

YES – Go to step 3.

NO – Go to step 4.

3. Measure voltage between PCM connector terminals A32 and B20 with the brake pedal pressed.



Wire side of female terminals

Is there battery voltage?

YES – The brake pedal position switch signal is OK. ■

NO – Repair open in the wire between the PCM (A32) and the brake pedal position switch. ■

4. Inspect the STOP (20A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

YES – Repair open in the wire between the brake pedal position switch and the STOP (20A) fuse. Inspect the brake pedal position switch (see page 19-10). ■

NO – Repair short in the wire between the PCM (A32) and the STOP (20A) fuse. Replace the STOP (20A) fuse. ■

BACK

Protected by AR

Idle Speed Adjustment

Adjust the idle speed using the Honda PGM Tester procedure if possible. If not, use the following procedure:

NOTE:
- Leave the IAC valve connected.
- Before setting the idle speed, check these items:
  - The MIL has not been reported on.
  - Ignition timing
  - Spark plugs
  - Air cleaner
  - PCV system
- On Canadian models, press the parking brake pedal. Start the engine, then check that the headlights are off.

1. Disconnect the EVAP canister purge valve 2P connector.

2. Connect a tachometer.

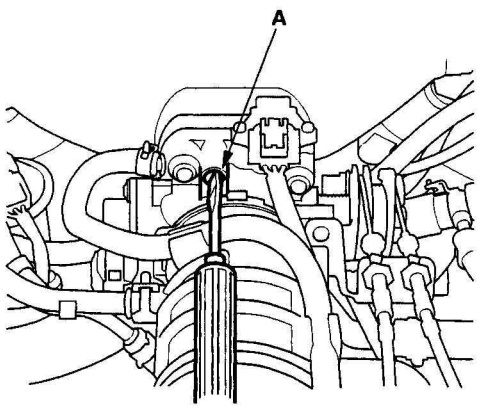
3. Start the engine. Hold the engine at 3,000 rpm with no load (transmission in Park or neutral position) until the radiator fan comes on, then let it idle.

4. Check the idle speed with no-load conditions: headlights, blower fan, rear defogger, radiator fan, and air conditioner off.

   Idle speed should be:
   '99-01 models: 680±50 rpm (in Park or neutral)
   '02-03 models: 750±50 rpm (in Park or neutral)

5. Adjust the idle speed, if necessary, by turning the idle adjusting screw (A) 1/4-turn clockwise or counterclockwise.

   NOTE: Do not turn the idle adjusting screw more than 1/4-turn without checking the idle speed.



6. After turning the idle adjusting screw 1/4-turn, check the idle speed again. If it is out of spec, turn the idle adjusting screw 1/4-turn again.

7. Allow the engine to idle for 1 minute with the heater fan switch at HI and air conditioner on, then check the idle speed.

   Idle speed should be:
   '99-01 models: 680±50 rpm (in Park or neutral)
   '02-03 models: 750±50 rpm (in Park or neutral)

   NOTE:
   - Do not turn the idle adjusting screw when the air conditioner is on.
   - If the idle speed is not within specification, see the Symptom Troubleshooting Index.

8. Reconnect the EVAP canister purge valve 2P connector.

BACK

Protected by AR

PCM Idle Learn Procedure

The idle learn procedure must be done so the PCM can learn the engine idle characteristics. Do the idle learn procedure whenever you do any of these actions:

- Reset the PCM.
- NOTE: Erasing DTCs with the Honda PGM Tester does not require you to do the idle learn procedure.
- Remove the battery or disconnect its terminals.
- Remove the PCM or disconnect its connectors.
- Remove the driver's or passenger's under-dash fuse/relay box.
- Remove the BATTERY (120A) fuse from the under-hood fuse/relay box.
- Remove the BACK-UP, ACC (40A) fuse from the under-hood fuse/relay box.
- Remove the No. 13 CLOCK, BACK-UP (7.5A) fuse from the passenger's under-dash fuse/relay box.
- Remove the PGM-FI main relay.
- Disconnect the starter cable terminal from the under-hood fuse/relay box.
- Disconnect the connectors between engine wire harness and left engine compartment wire harness.
- Disconnect the connectors between the dashboard wire harness A and the dashboard wire harness B.
- Disconnect the ground terminals, G1, G2, G101, and G102.

To complete the idle learn procedure, do this:

1. Make sure all electrical items (A/C, audio, rear window defogger, lights, etc.,) are off.

2. Start the engine, and hold it at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, or until the engine coolant temperature reaches 194°F (90°C).

3. Let the engine idle for about 5 minutes with the throttle fully closed.

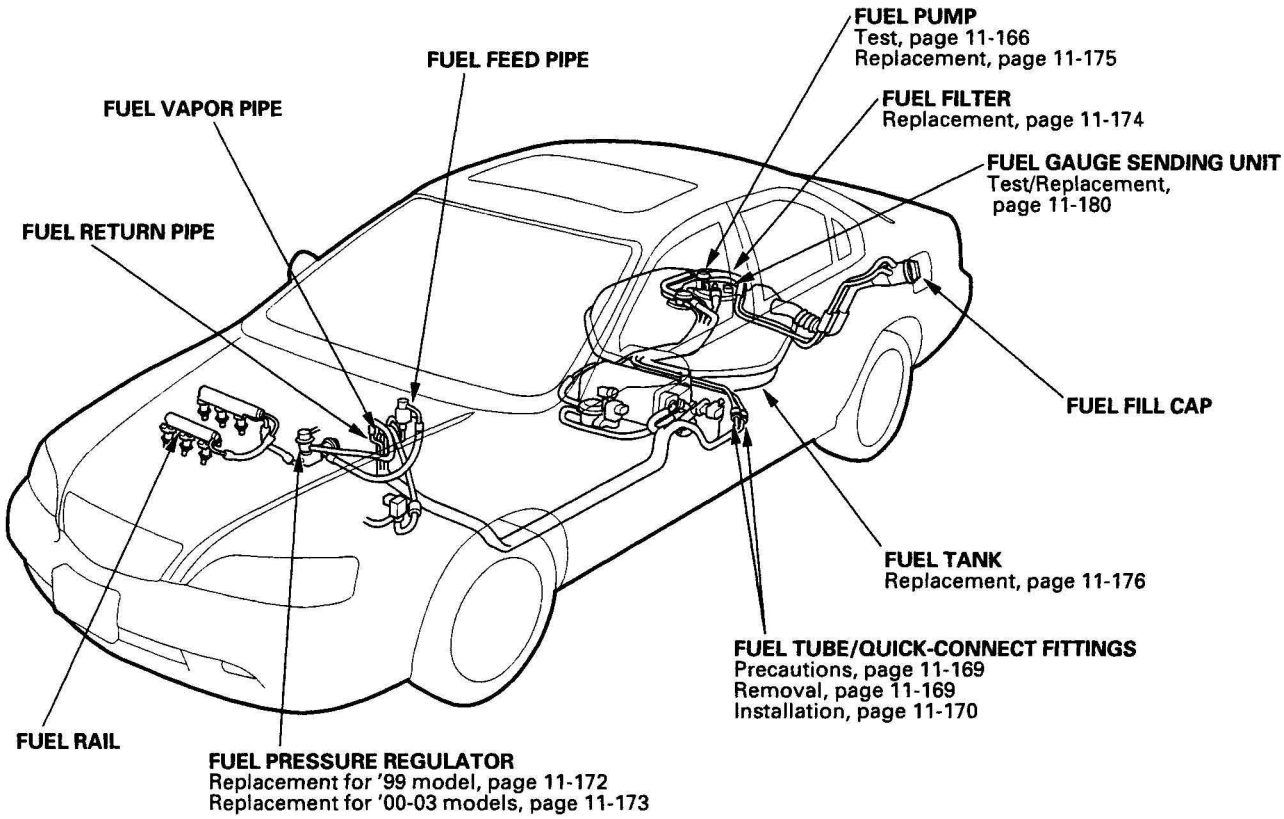
NOTE: If the radiator fan comes on, do not include its running time in the 5 minutes.

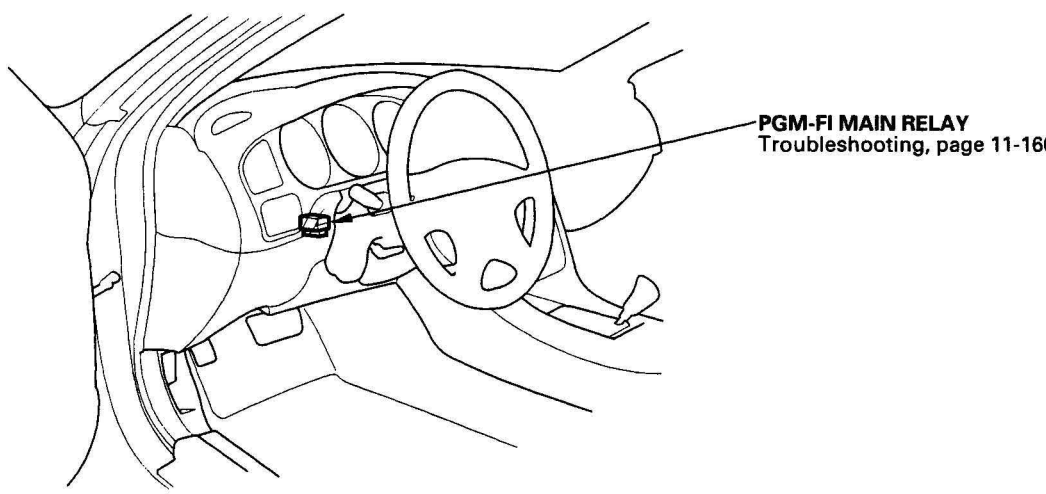
BACK

Protected by AR

Component Location Index

NOTE: The illustlation shows '00-03 models.





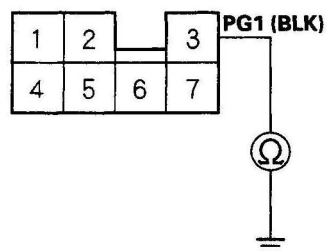
BACK

Protected by AR

PGM-FI Main Relay Circuit Troubleshooting

1. Turn the ignition switch OFF.
2. Disconnect the PGM-FI main relay 7P connector.
3. Check for continuity between body ground and PGM-FI main relay 7P connector terminal No. 3.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

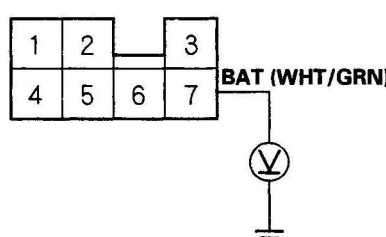
Is there continuity?

YES – Go to step 4.

NO – Repair open in the wire between the PGM-FI main relay and G101. ■

4. Measure voltage between body ground and PGM-FI main relay 7P connector terminal No. 7.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 6.

NO – Go to step 5.

5. Check for a blown ACG S (15 A) fuse in the under-hood fuse/relay box.

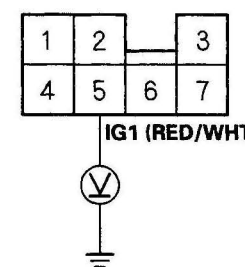
Is the fuse blown?

YES – Repair the short in the wire between the PGM-FI main relay and the ACG S (15 A) fuse. ■

NO – Repair the open in the wire between the PGM-FI main relay and the ACG S (15 A) fuse. ■

6. Turn the ignition switch ON (II).
7. Measure voltage between body ground and PGM-FI main relay 7P connector terminal No. 5.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 9.

NO – Go to step 8.

8. Check for a blown No. 1 FUEL PUMP (15 A) fuse in the driver's under-dash fuse/relay box.

Is the fuse blown?

YES – Repair the short in the wire between the PGM-FI main relay and the No.1 FUEL PUMP (15A) fuse. ■

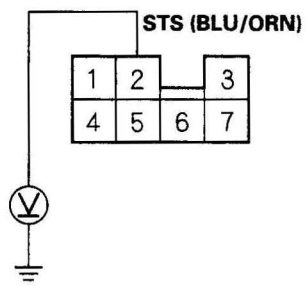
NO – Repair the open in the wire between the PGM-FI main relay and the No.1 FUEL PUMP (15 A) fuse. ■

BACK

Protected by AR

9. Shift to Park, then turn the ignition switch to the START (III) position, and measure voltage between body ground and PGM-FI main relay 7P connector terminal No. 2.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 11.

NO – Go to step 10.

10. Check for a blown No. 13 STARTER SIGNAL (7.5 A) fuse in the driver's under-dash fuse/relay box.

Is the fuse blown?

YES – Repair the short in the wire between the PGM-FI main relay and the No. 13 STARTER SIGNAL (7.5 A) fuse. ■

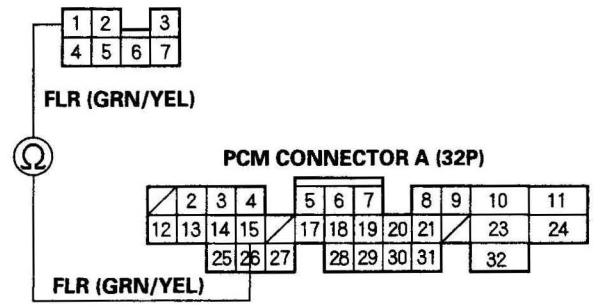
NO – Repair the open in the wire between the PGM-FI main relay and the No. 13 STARTER SIGNAL (7.5 A). ■

11. Turn the ignition switch OFF.

12. Disconnect the PCM connector A (32P).

13. Check for continuity between PGM-FI main relay 7P connector terminal No. 1 and PCM connector terminal A15.

PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Go to step 14.

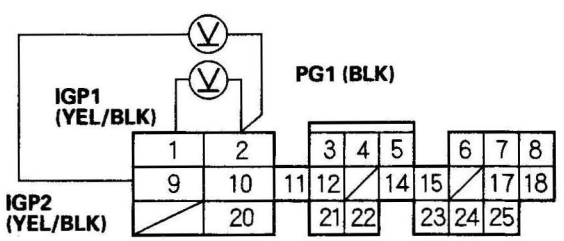
NO – Repair open in the wire between the PGM-FI main relay and the PCM (A15). ■

14. Reconnect the PCM connector A (32P) and the PGM-FI main relay 7P connector.

15. Turn the ignition switch ON (II).

16. Measure voltage between the PCM connector terminals B1 and B2, and between B9 and B2.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 17.

NO – Check for an open in the wires between the PGM-FI main relay and the PCM (B1, B9). If the wires are OK, replace the PGM-FI main relay. ■

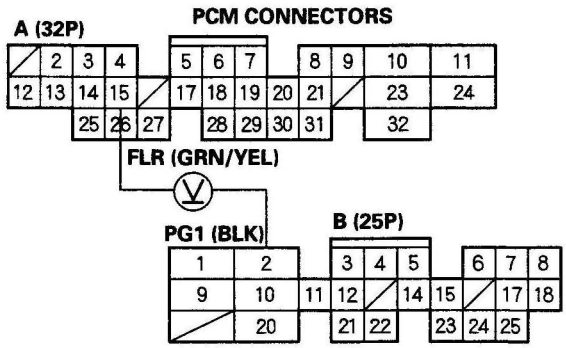
(cont'd)

Protected by AR

PGM-FI Main Relay Circuit Troubleshooting (cont'd)

17. Turn the ignition switch OFF, then ON (II) again.

18. Measure voltage between PCM connector terminals A15 and B2 within the first 2 seconds after the ignition switch is turned ON (II).



Is there 1.0 V or less?

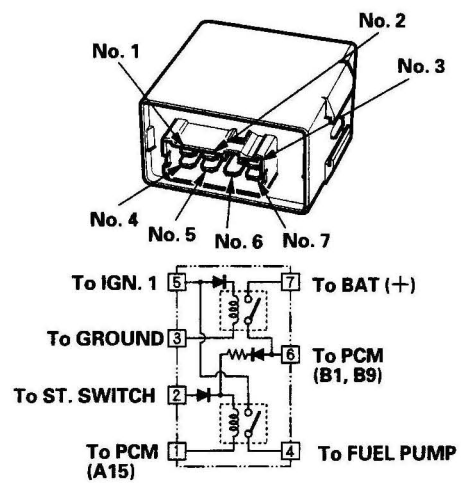
YES – PGM-FI main relay may be faulty; go to step 19.

NO – Substitute a known-good PCM and recheck (see page 11-5). If prescribed voltage is now available, replace the original PCM. ■

19. Remove the PGM-FI main relay.

20. Connect battery power to PGM-FI main relay 7P connector terminal No. 2 and connect ground to PGM-FI main relay 7P connector terminal No. 1. Then check for continuity between PGM-FI main relay 7P connector terminals No. 5 and No. 4.

NOTE: Use the terminal number shown. Ignore the terminal numbers molded into the relay.



Is there continuity?

YES – Go to step 21.

NO – Replace the PGM-FI main relay and reset. ■

21. Connect battery power to PGM-FI main relay 7P connector terminal No. 5, and connect ground to PGM-FI main relay 7P connector terminal No. 3. Then check for continuity between PGM-FI main relay 7P connector terminals No. 7 and No. 6.

Is there continuity?

YES – Go to step 22.

NO – Replace the PGM-FI main relay and reset. ■

22. Connect battery power to PGM-FI main relay 7P connector terminal No. 6, and connect ground to PGM-FI main relay 7P connector terminal No. 1. Then check for continuity between PGM-FI main relay 7P connector terminals No. 5 and No. 4.

Is there continuity?

YES – The PGM-FI main relay is OK. ■

NO – Replace the PGM-FI main relay and retest. ■

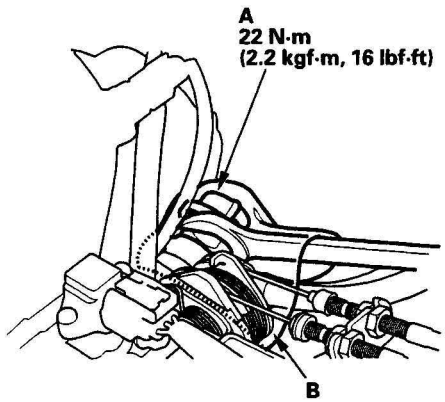
BACK

Protected by AR

Fuel Pressure Relieving

Before disconnecting the fuel pipes or hoses, release pressure from the system by loosening the fuel pulsation damper on top of the fuel rail.

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the fuel fill cap.
4. Use a wrench on the fuel pulsation damper (A).



5. Place a rag or shop towel (B) over the fuel pulsation damper.
6. Slowly loosen the fuel pulsation damper one complete turn.

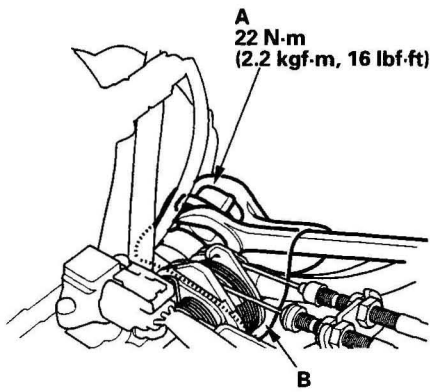
   NOTE: Replace all washers whenever the fuel pulsation damper is loosened or removed.

Protected by AR

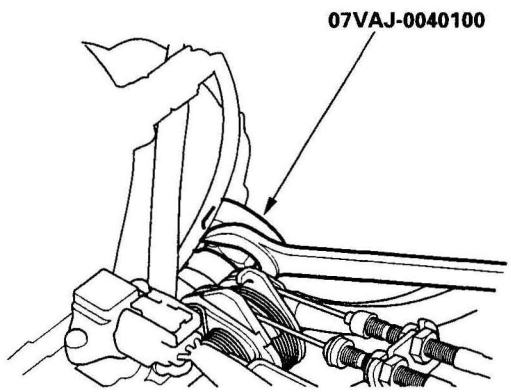
Fuel Pressure Test

Special Tools Required
- Fuel pressure gauge 07406-004000A
- Fuel pressure gauge attachment 07VAJ-0040100

1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the fuel fill cap.
4. Use a wrench on the fuel pulsation damper (A) at the fuel rail.

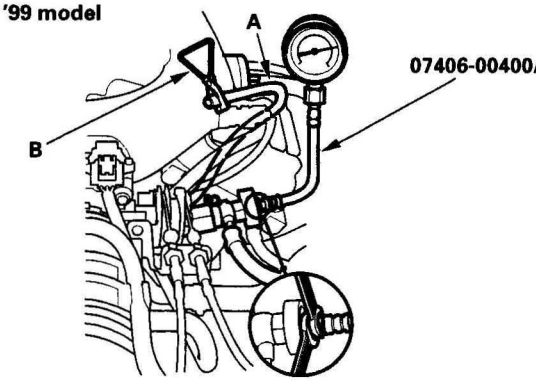


5. Place a rag or shop towel (B) over the fuel pulsation damper.
6. Slowly loosen the fuel pulsation damper one complete turn.
7. Remove the fuel pulsation damper from its fitting, and attach the fuel pressure gauge attachment.

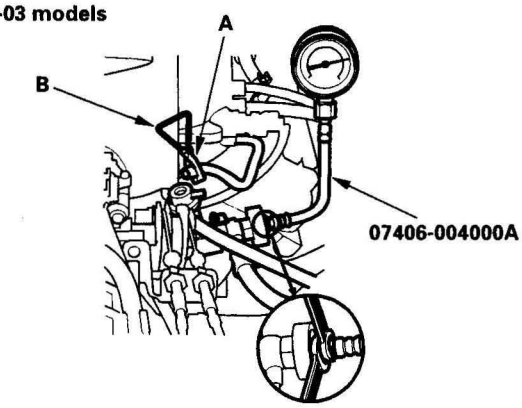


8. Attach the fuel pressure gauge.

'99 model



'00-03 models



9. Disconnect the vacuum hose (A) of the fuel pressure regulator, and pinch it closed with a clamp (B).
10. Reconnect the negative battery cables, and start the engine and let it idle.
    - If the engine starts, go to step 12.
    - If the engine does not start, go to step 11.
11. Check to see if the fuel pump is running: listen to the injector rails underneath the intake manifold cover while an assistant turns the ignition switch ON (II). You should hear the fuel flow through the injector rails for about 2 seconds when the ignition turned ON (II).
    - If the pump runs, go to step 12.
    - If the pump does not run, test the fuel pump (see page 11-166).

BACK

Protected by AR

12. Read the pressure gauge (with the fuel pressure regulator vacuum hose disconnected and clamped). The pressure should be 280 – 330 kPa (2.9 – 3.4 kgf/cm², 41 – 48 psi) for '99-00 models or 330 – 380 kPa (3.4 – 3.9 kgf/cm², 48 – 55 psi) for '01-03 models.

    - If the pressure is OK and engine is running, go to step 13. If not running, repair the cause, then continue this test.
    - If the pressure is out of spec, go to step 14.

13. With the engine running, reconnect the vacuum hose and read the gauge again. The pressure should be 220 – 270 kPa (2.25 – 2.75 kgf/cm², 32 – 40 psi) for '99-00 models or 270 – 320 kPa (2.75 – 3.25 kgf/cm², 40 – 46 psi) for '01-03 models.

    - If the fuel pressure is OK, the test is complete. Go to step 15.
    - If the pressure is out of spec, go to step 14.

14. Disconnect the vacuum hose from the pressure regulator again while you watch the pressure gauge. The pressure should rise when you disconnect the hose.

    - If the pressure did not rise, check the vacuum hose for leakage, clogging or loose connections. If it's OK, then replace the fuel pressure regulator for '99 model (see page 11-172) or for '00-03 models (see page 11-173) and recheck the fuel pressure.
    - If the pressure rose, and all your readings were within spec, go to step 15.
    - If the pressure rose, but your readings were out of spec, check for these problems:

        – If the pressure is too low, check for a clogged fuel filter and for leaks in the fuel lines.
        – If the pressure is too high, check for a pinched or clogged fuel return hose or line.

15. Reconnect the vacuum hose, remove the pressure gauge, and reinstall the fuel pulsation damper and a new washer. Tighten the fuel pulsation damper to 22 N·m (2.2kgf·m, 16 lbf·ft).

    NOTE: Disassemble and clean the fuel pressure gauge attachment thoroughly after use.

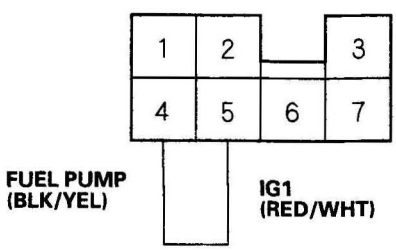
Protected by AR

Fuel Pump Test

If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is ON, you will hear fuel flow if you listen to the injector rails underneath the intake manifold cover. The fuel pump should run for 2 seconds when the ignition switch is first turned ON(II). If the fuel pump does not make noise, check as follows:

1. Remove the spare tire lid.
2. Remove the access panel from the floor.
3. Turn the ignition switch OFF.
4. Disconnect the fuel pump 5P connector.
5. Connect PGM-FI main relay 7P connector terminals No. 4 and No. 5 with a jumper wire.

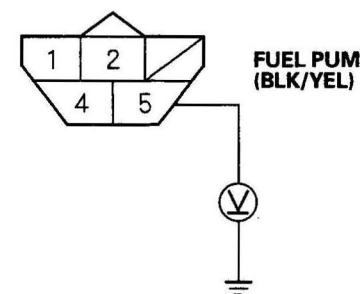
PGM-FI MAIN RELAY 7P CONNECTOR



Wire side of female terminals

6. Turn the ignition switch ON (II).
7. Check that battery voltage is available between fuel pump 5P connector terminal No. 5 and body ground when the ignition switch is turned ON (II).
   - If battery voltage is available, check the fuel pump ground. If the ground is OK, replace the fuel pump (see page 11-175).
   - If there is no voltage, check the wire harness (see page 11-160).

FUEL PUMP 5P CONNECTOR



Wire side of female terminals

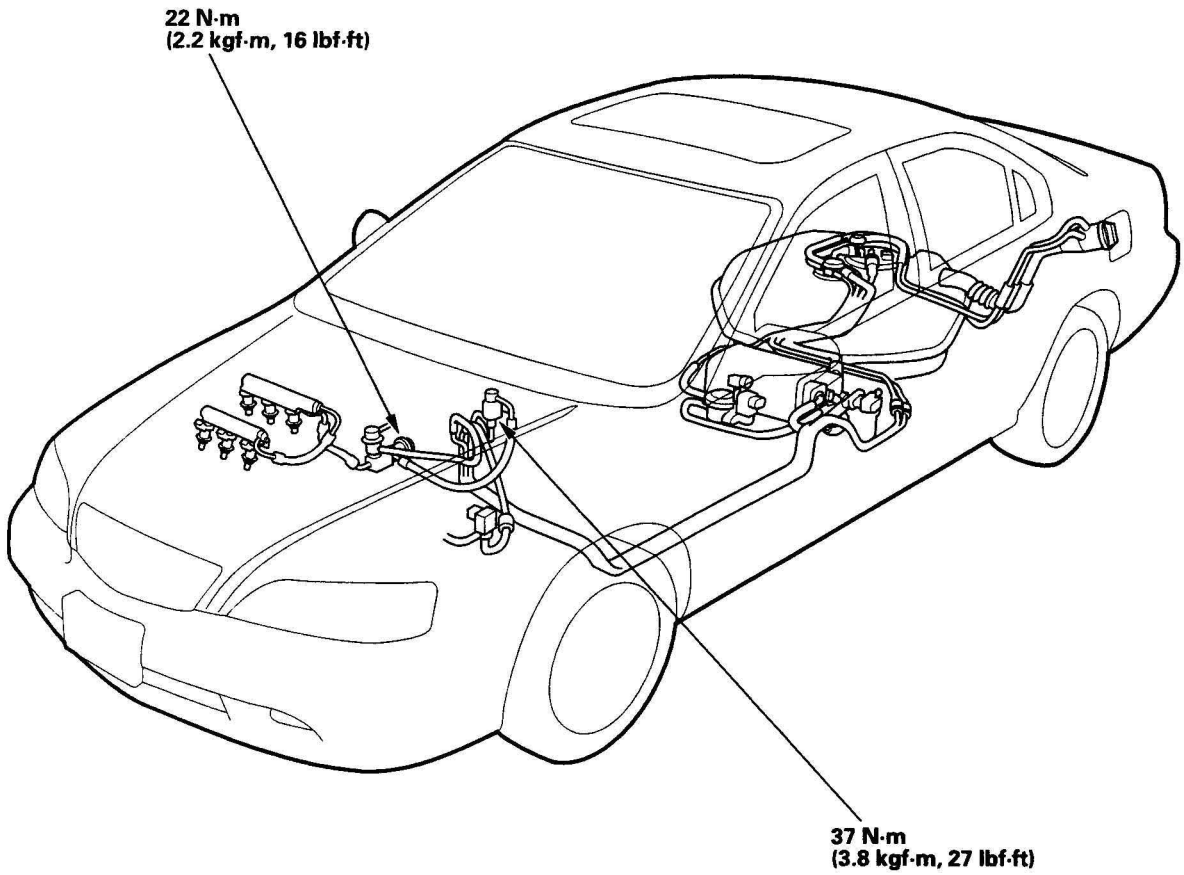
BACK

Protected by AR

Fuel Line Inspection

Check the fuel system lines, hoses, and fuel filter for damage, leaks, and deterioration. Replace any damaged parts.

NOTE: The illustlation shows '00-03 models.



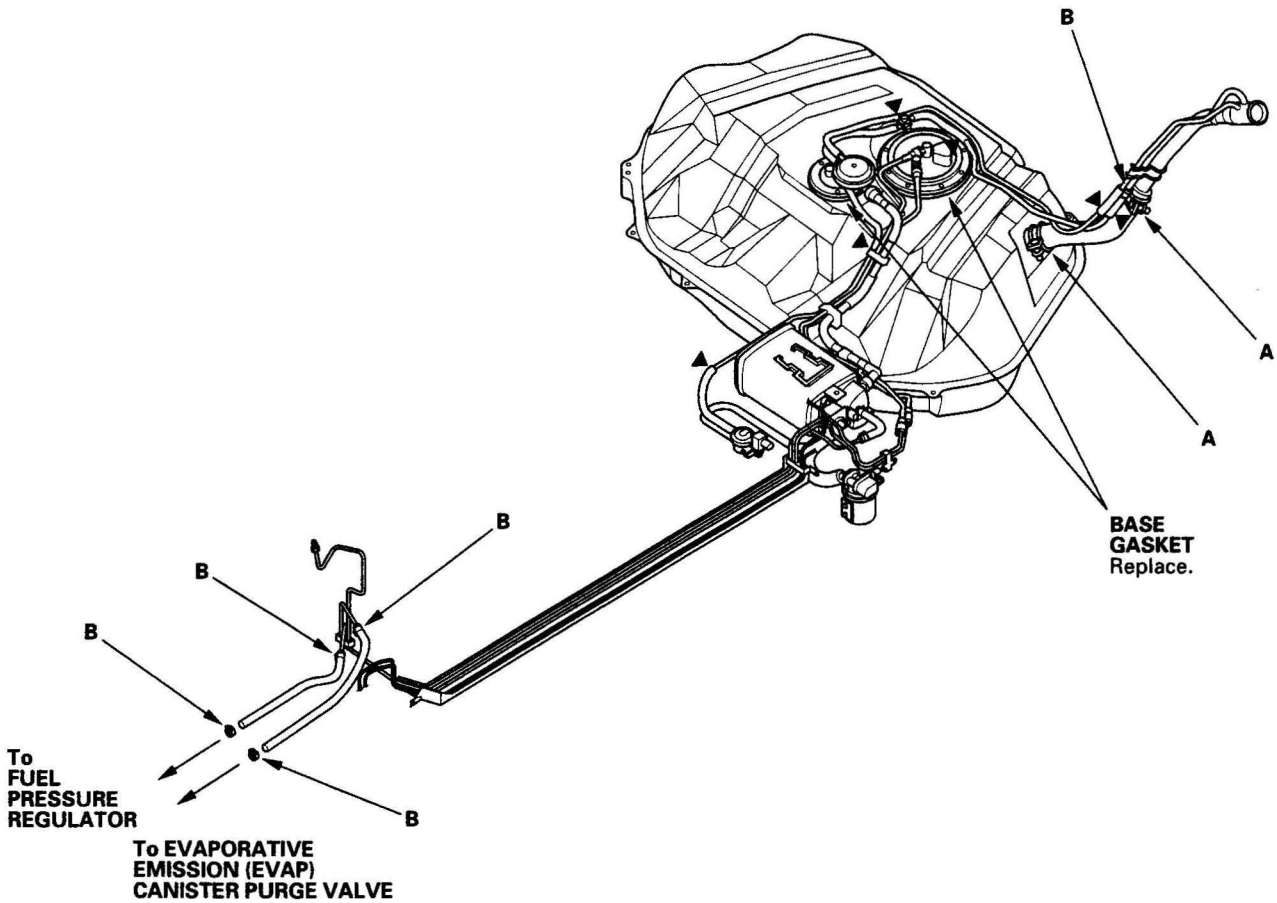
(cont'd)

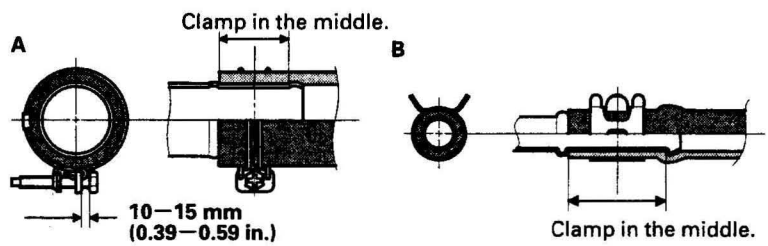
BACK

Protected by AR

Fuel Line Inspection (cont'd)

Check all clamps and retighten if necessary.
▲: Do not disconnect the hose from the pipe at these joints.





BACK

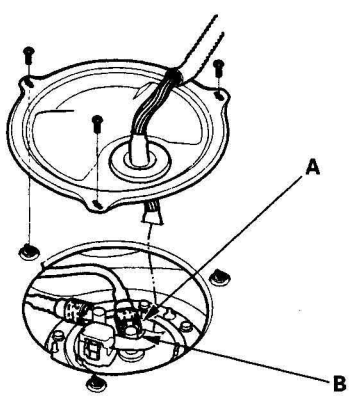
Protected by AR

Fuel Tube/Quick-Connect Fittings Precaution

The fuel tube/quick-connect fittings assembly connects the in-tank fuel pump to the fuel feed pipe and the fuel return pipe. When removing or installing the fuel pump and fuel tank, it is necessary to disconnect or connect the quick-connect fittings.
Pay attention to following:

- The fuel tubes (A) and quick-connect fittings (B) are not heat-resistant; be careful not to damage them during welding or other heat-generating procedures.
- The fuel tubes and quick-connect fittings are not acid-proof; do not touch then with a shop towel which was used for wiping battery electrolyte. Replace them if they came into contact with electrolyte or something similar.
- When connecting or disconnecting the fuel tubes and quick-connect fittings, be careful not to bend or twist it excessively. Replace them if damaged.

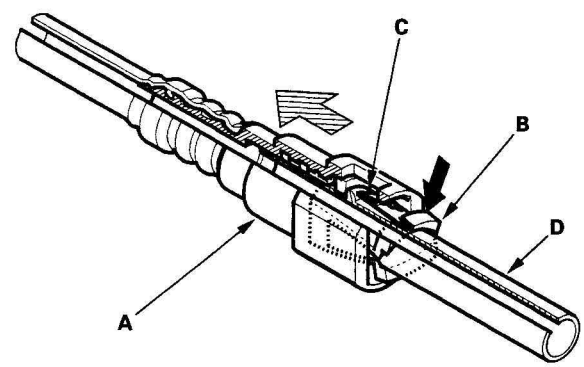
A disconnected quick-connect fittings can be reconnected, but the retainer on the mating pipe cannot be reused once it has been removed from the pipe. Replace the retainer when
- replacing the fuel pump.
- replacing the fuel filter.
- replacing the fuel feed pipe.
- replacing the fuel return pipe.
- it has been removed from the pipe.
- it is damaged.



Fuel Tube/Quick-Connect Fittings Removal

1. Relieve fuel pressure (see page 11-163).
2. Check the fuel quick-connect fittings for dirt, and clean if necessary.
3. Hold the connector (A) with one hand and squeeze the retainer tabs (B) with the other hand to release them from the locking pawls (C). Pull the connector off.

   NOTE:
   - Be careful not to damage the pipe (C) or other parts.
     Do not use tools.
   - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
   - Do not remove the retainer from the pipe; once removed, the retainer must be replaced with a new one.

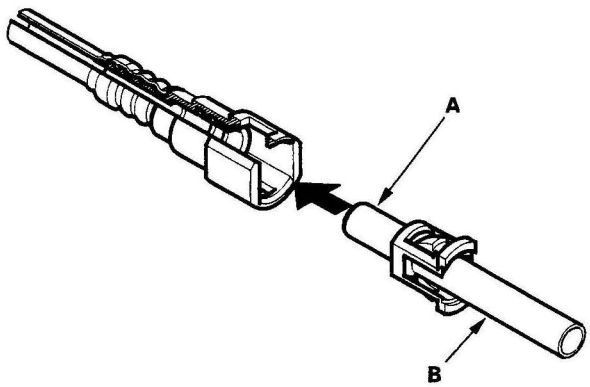


(cont'd)

Protected by AR

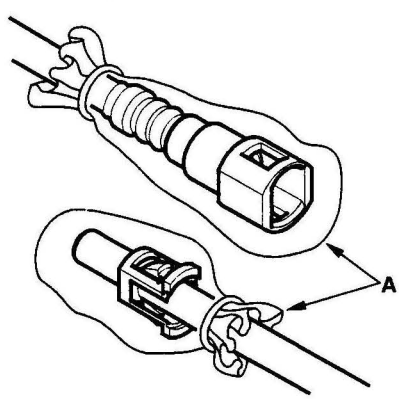
Fuel Tube/Quick-Connect Fittings Removal (cont'd)

4. Check the contact area (A) of the pipe (B) for dirt and damage.
   - If the surface is dirty, clean it.
   - If the surface is rusty or damaged, replace the fuel pump, fuel filter, fuel feed pipe or fuel return pipe.



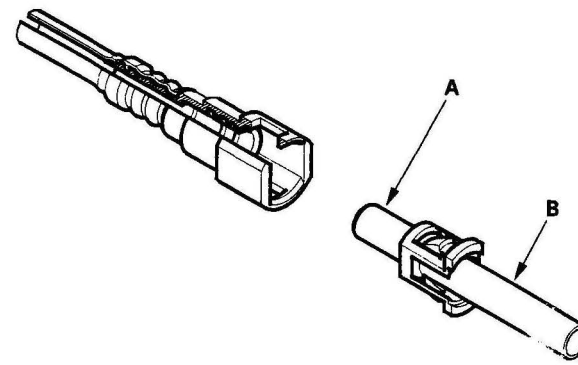
5. To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with plastic bags (A).

NOTE:
- The retainer cannot be reused once it has been removed from the pipe.
  Replace the retainer when
  - replacing the fuel pump.
  - replacing the fuel filter.
  - replacing the fuel feed pipe.
  - replacing the fuel return pipe.
  - it has been removed from the pipe.
  - it is damaged.

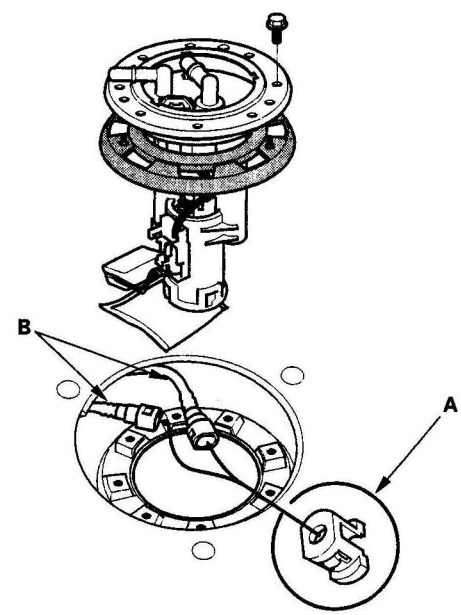


Fuel Tube/Quick-Connect Fittings Installation

1. Check the contact area (A) of the pipe (B) for dirt and damage, and clean if necessary.



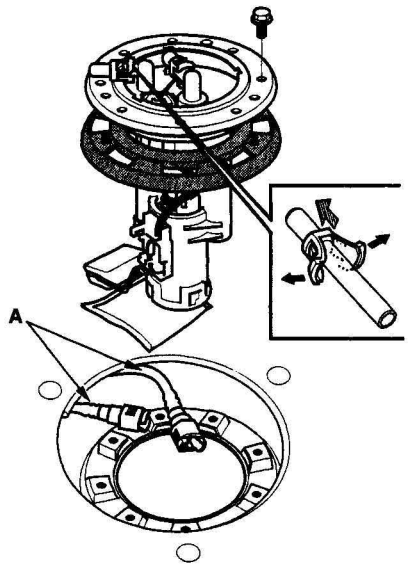
2. Insert a new retainer (A) into the connector (B) if the retainer is damaged, or after
   - replacing the fuel pump.
   - replacing the fuel filter.
   - replacing the fuel feed pipe.
   - replacing the fuel return pipe.
   - removing the retainer from the pipe.



BACK

Protected by AR

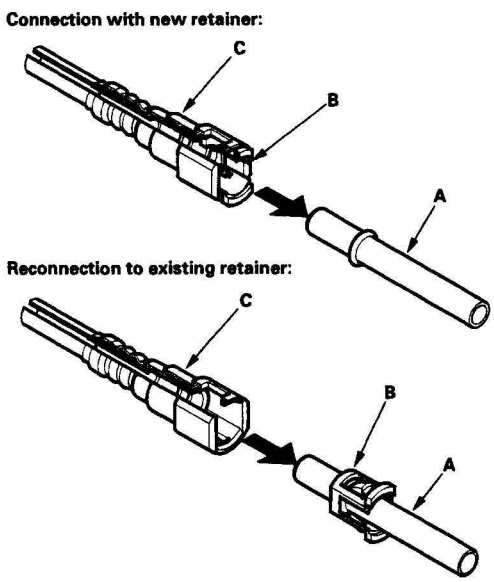
3. Before connecting a new fuel tube/quick-connect fitting assembly (A), remove the old retainer from the mating pipe.



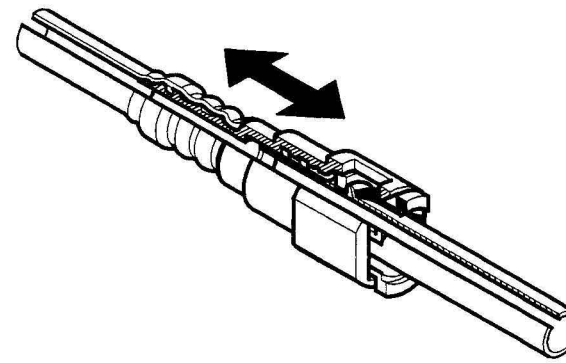
4. Align the quick-connect fittings with the pipe (A), and align the retainer (B) locking pawls with the connector (C) grooves. Then press the quick-connect fittings onto the pipe until both retainer pawls lock with a clicking sound.

   NOTE: If it is hard to connect, put a small amount of new engine oil on the pipe end.

Connection with new retainer:



5. Make sure the connection is secure and that the pawls are firmly locked into place; check visually and by pulling the connector.



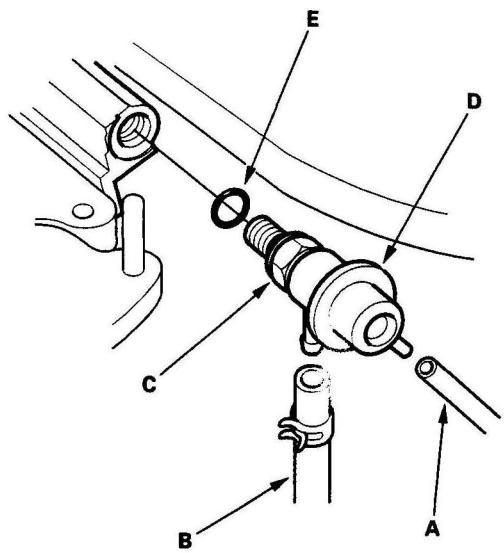
6. Reconnect the battery negative cable, and turn the ignition switch ON (II). The fuel pump will run for about 2 seconds, and fuel pressure will rise. Repeat 2 or 3 times, and check that there is no leakage in the fuel supply system.

Protected by AR

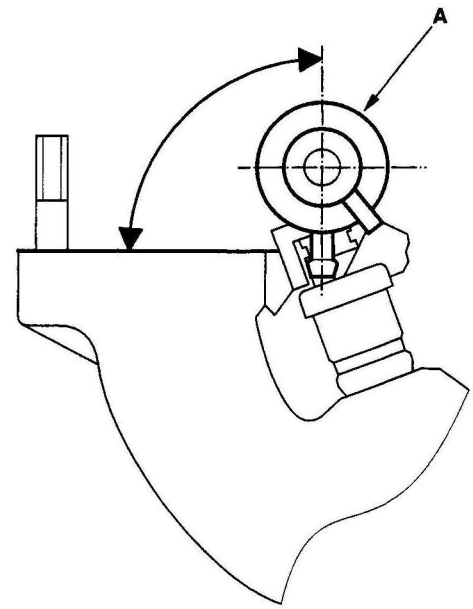
Fuel Pressure Regulator Replacement

'99 Model:

1. Remove the intake manifold cover and intake manifold (see page 9-2).
2. Place a shop towel under the fuel pressure regulator, then relieve fuel pressure (see page 11-163).
3. Disconnect the vacuum hose (A) and fuel return hose (B).



4. Loosen the locking nut (C), and remove the fuel pressure regulator (D).
5. Apply clean engine oil to a new O-ring (E), and carefully install it into its proper position.
6. Install the fuel pressure regulator in the fuel rail. Turn it by hand until stops.
7. Turn the fuel pressure regulator (A) counterclockwise to set the angle as shown.



8. Tighten the locking nut to 29 N·m (3.0 kgf·m, 22 lbf·ft).

   NOTE:
   - Replace the O-ring.
   - When assembling the fuel pressure regulator, apply clean engine oil to the O-ring and assemble it into its proper position, taking care not to damage the O-ring.

9. Install the intake manifold (see page 5-2) and manifold cover (see page 9-2).
10. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for approximately 2 seconds, the fuel pressure in the fuel line rises. Repeat this 2 or 3 times, then check for fuel leakage.

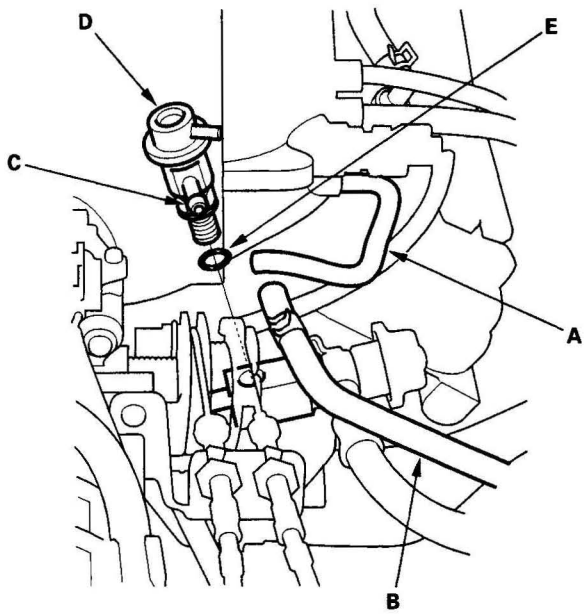
BACK

Protected by AR

'00-03 Models:

1. Place a shop towel under the fuel pressure regulator, then relieve fuel pressure (see page 11-163).

2. Disconnect the vacuum hose (A) and fuel return hose (B).

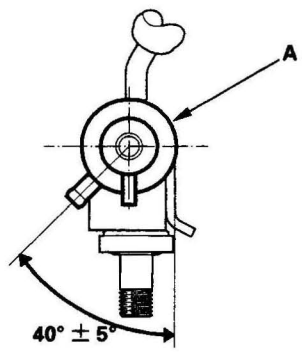


3. Loosen the locking nut (C), and remove the fuel pressure regulator (D).

4. Apply clean engine oil to a new O-ring (E), and carefully install it into its proper position.

5. Install the fuel pressure regulator in the fuel joint. Turn it by hand until stops.

6. Turn the fuel pressure regulator (A) counterclockwise to set the angle as shown.



7. Tighten the locking nut to 29 N·m (3.0 kgf·m, 22 lbf·ft).

   NOTE:
   - Replace the O-ring.
   - When assembling the fuel pressure regulator, apply clean engine oil to the O-ring and assemble it into its proper position, taking care not to damage the O-ring.

8. Reconnect the vacuum hose and fuel return hose.

9. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for about 2 seconds, the fuel pressure in the fuel line rises. Repeat this 2 or 3 times, then check whether there is any fuel leakage.

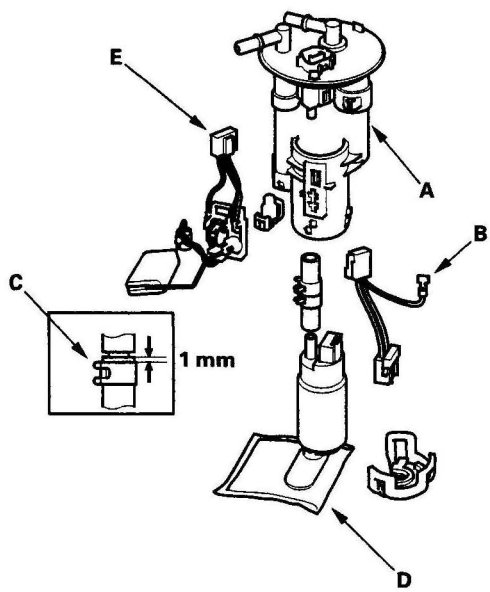
Protected by AR

Fuel Filter Replacement

The fuel filter should be replaced whenever the fuel pressure drops below the specified value (280—330 kPa, 2.9—3.4 kgf/cm², 41—48 psi with the fuel pressure regulator vacuum hose disconnected and pinched) after making sure that the fuel pump and the fuel pressure regulator are OK.

1. Remove the fuel tank unit (see page 11-175).

2. Remove the fuel filter (A).



3. Install the part in the reverse order of removal with a new base gasket, then check these items:

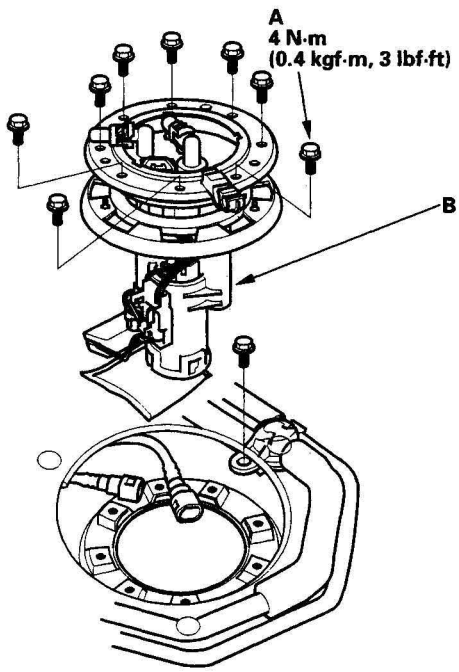
   - When connecting the wire harness, make sure the connection is secure and the terminal (B) is firmly locked into place.
   - Check that the tab of the clamp (C) does not interfere with the wire harness.
   - Do not push the lower part of the suction filter (D).
   - When installing the fuel gauge sending unit (E), make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.

BACK

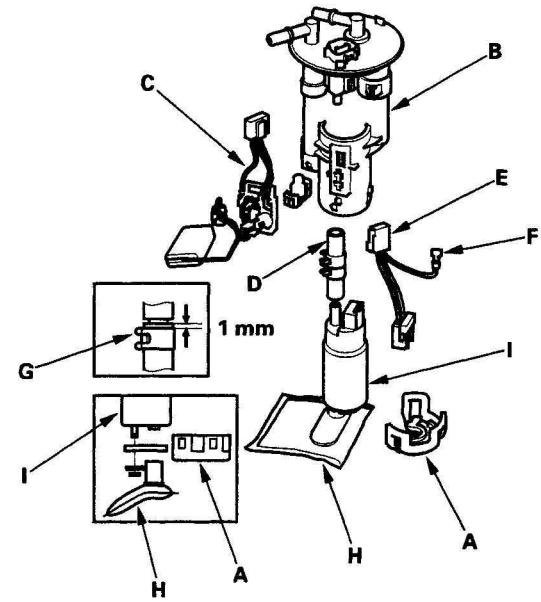
Protected by AR

Fuel Pump Replacement

1. Remove the spare tire lid.
2. Remove the access panel from the floor.
3. Turn the ignition switch OFF, then disconnect the fuel tank unit 5P connector.
4. Remove the fuel fill cap.
5. Relieve fuel pressure (see page 11-163).
6. Disconnect the quick-connect fittings from the fuel tank unit.
7. Remove the bolts (A), and the fuel pump assembly (B).



8. Remove the bracket (A), the fuel filter (B), the fuel gauge sending unit (C), the hose (D), and the wire harness (E).



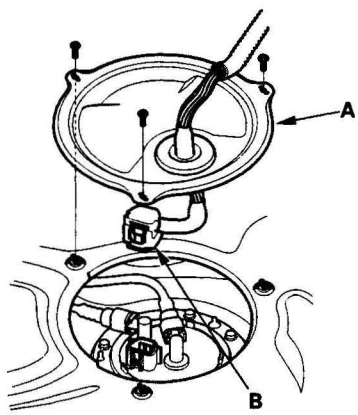
9. When connecting the fuel pump, make sure the connection is secure and the suction filter (H) is firmly connected to the fuel pump (I).
10. Install the tank unit in the reverse order of removal with a new base gasket, then check these items:
    - When connecting the wire harness, make sure the connection is secure and the terminal (F) is firmly locked into the place.
    - Check that the tab of the clamp (G) does not interfere with the wire harness.
    - Do not push the lower part of suction filter.
    - When installing the fuel gauge sending unit, make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.

Protected by AR

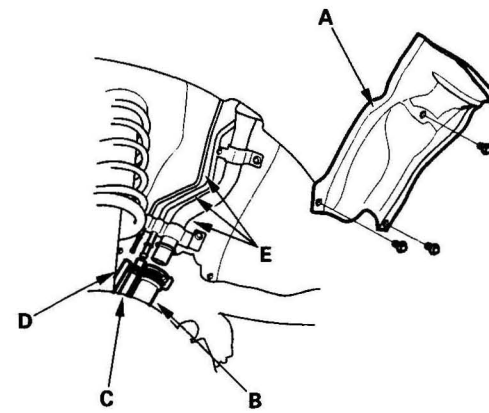
Fuel Tank Replacement

Removal

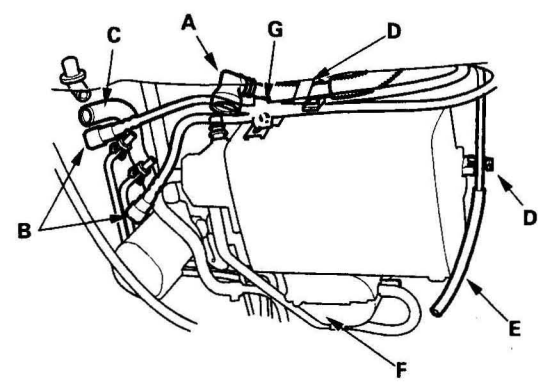
1. Relieve the fuel pressure (see page 11-163).
2. Remove the fuel fill cap.
3. Drain the fuel tank: Remove the fuel tank unit (see page 11-175). Using a hand pump, hose and container suitable for gasoline, draw the fuel from the fuel tank.
4. Remove the spare tire lid, and the access panel (A) from the floor. Disconnect the fuel tank 5P connector (B).



5. Loosen the rear wheel nuts slightly, then raise the vehicle and make sure it is securely supported. Remove the rear wheels.
6. Release the parking lever fully.
7. Remove the catalytic converter (see page 9-13).
8. Remove the fuel pipe cover (A).



9. Disconnect the fuel fill neck tube (B), the fuel tank vapor recirculation tube (C) and the fuel tank vapor signal tube (D) from the fuel fill pipes (E).
10. Disconnect the fuel tank vapor vent tube (A) and the quick-connect fittings (B).

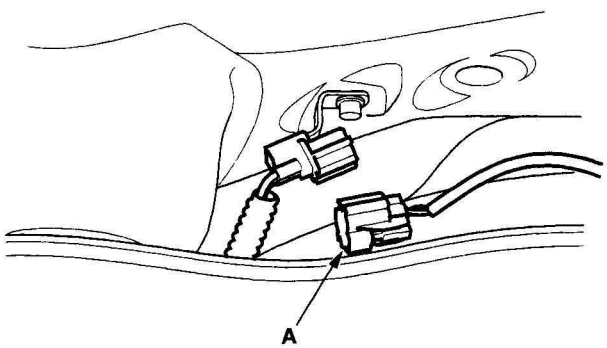


11. Disconnect the hose (C).
12. Remove the hose from the pipe holder (D).
13. Disconnect the hose (E) from the EVAP two way valve (F).
14. Remove the pipe holder (G).

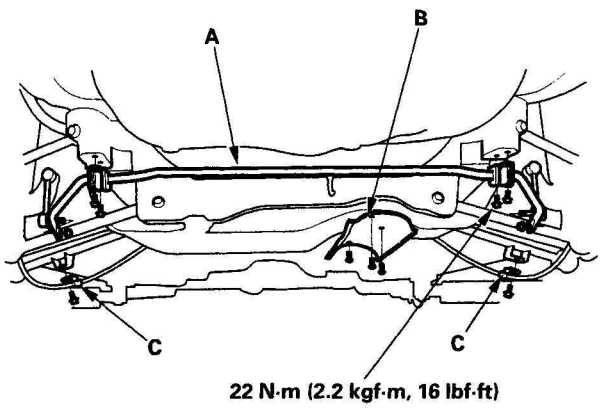
BACK

Protected by AR

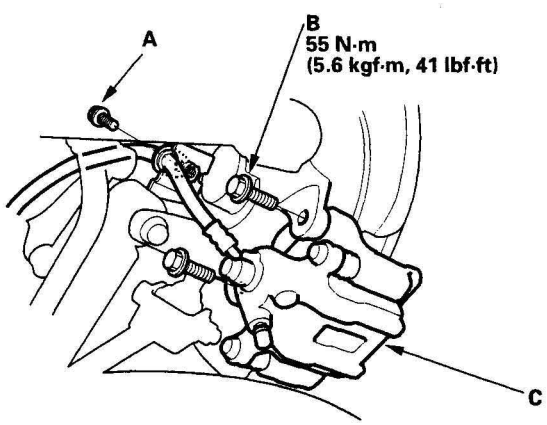
15. If the vehicle has ABS, disconnect the wheel sensor 2P connectors (A) if not, go to step 16.



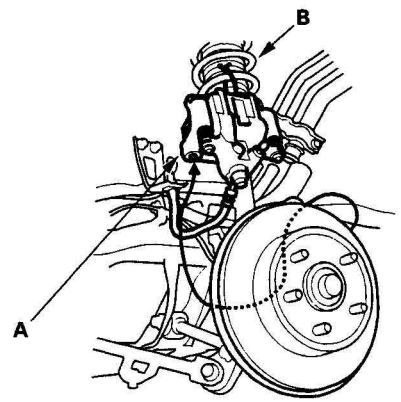
16. Remove the stabilizer bar (A), the heat shield (B) and the parking brake cable bracket (C).



17. Remove the bolt (A), two caliper bolts (B) and caliper body (C).



18. Hook the caliper body (A) to the damper spring (B) with a wire.



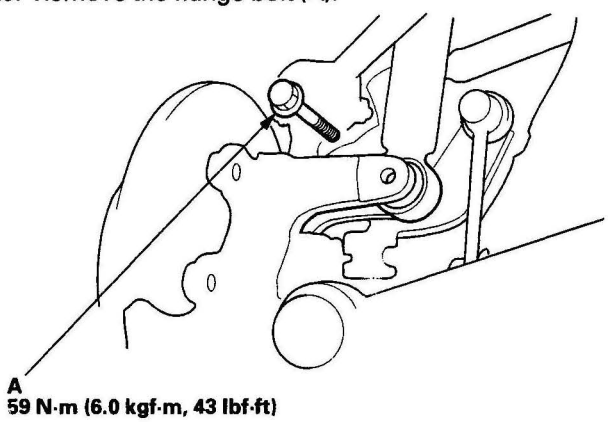
19. Remove the parking brake cable (see page 19-32).

(cont'd)

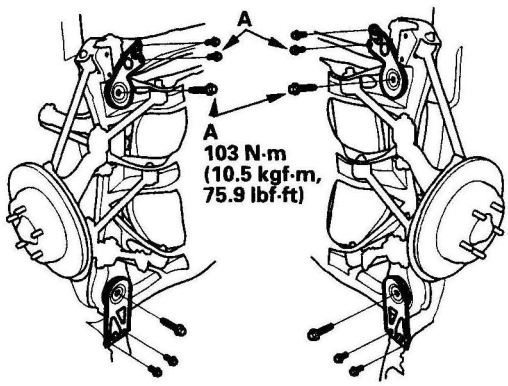
Protected by AR

Fuel Tank Replacement (cont'd)

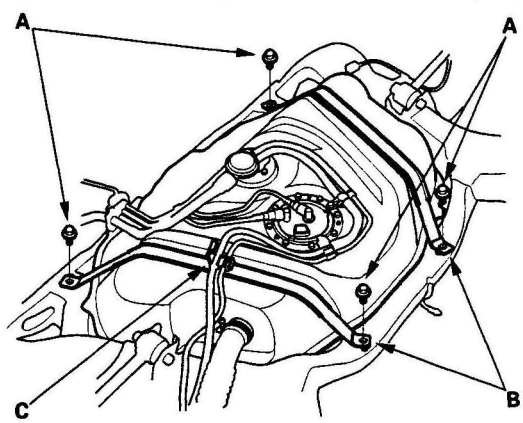
20. Remove the flange bolt (A).



21. Place a jack, or support, under the rear suspension sub frame. Remove the mounting bolts (A). Remove the rear suspension sub frame.



22. Remove the bolts (A), and the fuel tank straps (B).

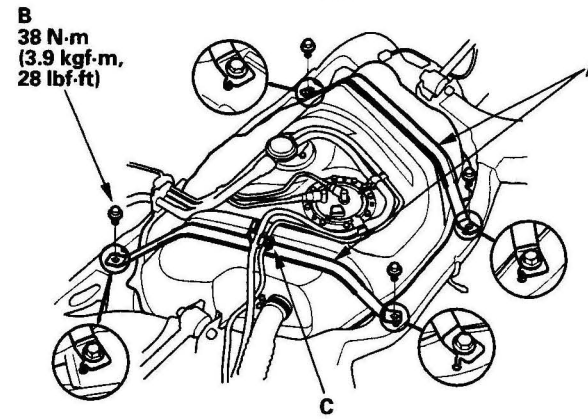


23. Remove the lines from the fuel line clip (C).

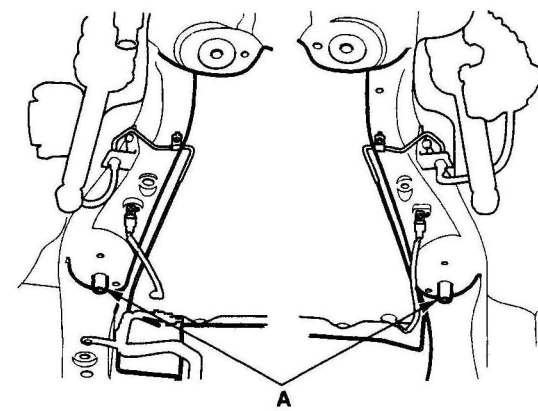
24. Lift the fuel tank out of the sub frame.

Installation

1. Install the fuel tank straps (A), and tighten the bolts (B). Install the hose to the pipe holder (C).



2. Place the jack, or support, under the rear suspension sub frame. Install the rear suspension sub frame, aligning the pins (A) with the holes in the rear suspension sub frame.



3. Install the remaining parts in the reverse order of removal.

4. After installing, adjust the wheel alignment (see page 18-5).

BACK

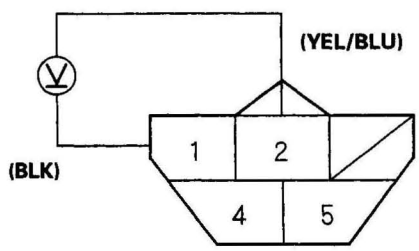
Protected by AR

Fuel Gauge Test

NOTE: For the fuel gauge system circuit diagram, refer to the Gauges Circuit Diagram (see page 22-110).

1. Check the No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A) fuse in the driver's under-dash fuse/relay box before testing.
2. Turn the ignition switch OFF.
3. Remove the spare tire lid.
4. Remove the access panel from the floor.
5. Disconnect the fuel pump 5P connector.
6. Measure voltage between fuel pump 5P connector terminals No. 1 and No. 2 with the ignition switch ON (II). There should be between 10 and 12.5 V.
   - If the voltage is as specified, go to step 7.
   - If the voltage is not as specified, check for:
     - an open in the YEL/BLU or BLK wire.
     - poor ground (G501).

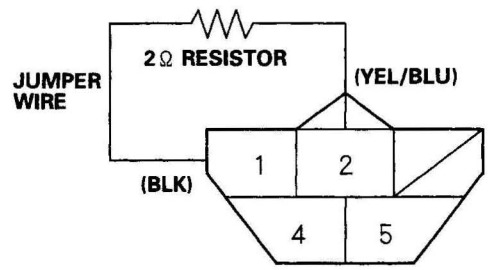
FUEL PUMP 5P CONNECTOR



Wire side of female terminals

7. Turn the ignition switch OFF.
8. Install a 2 Ω resistor between fuel pump 5P connector terminals No. 1 and No. 2.
9. Turn the ignition switch ON (II).

FUEL PUMP 5P CONNECTOR



Wire side of female terminals

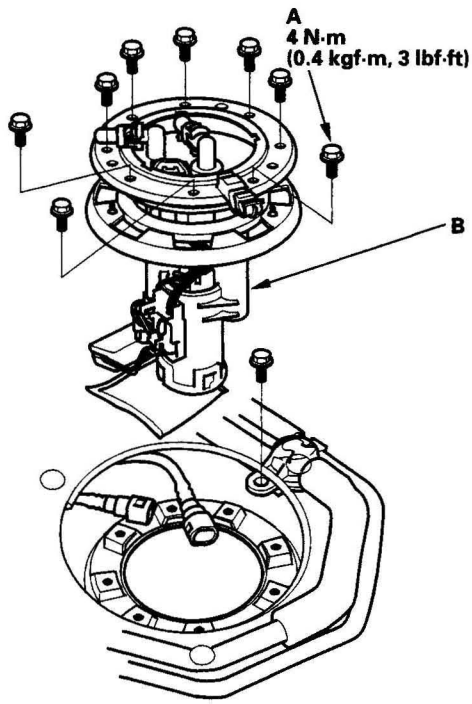
10. Check that the pointer of the fuel gauge indicates "F".
    - If the pointer of the fuel gauge does not indicate, replace the gauge.
    - If the gauge is OK, inspect the fuel gauge sending unit (see page 11-180).

NOTE:
The pointer of the fuel gauge returns to the bottom on the gauge dial when the ignition switch is OFF regardless of the fuel level.

Protected by AR

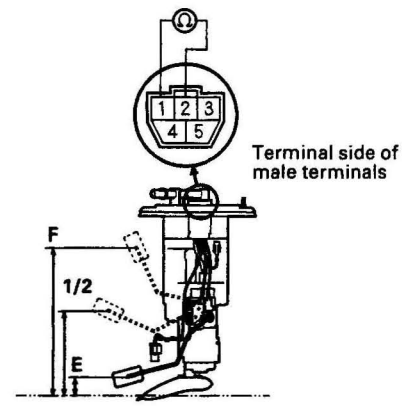
Fuel Gauge Sending Unit Test/Replacement

1. Remove the spare tire lid.
2. Remove the access panel from the floor.
3. Turn the ignition switch OFF, then disconnect the fuel pump 5P connector.
4. Remove the fuel fill cap.
5. Relieve the fuel pressure (see page 11-163).
6. Disconnect the quick-connect fittings from the fuel pump.
7. Remove the bolts (A) and the fuel tank unit (B).

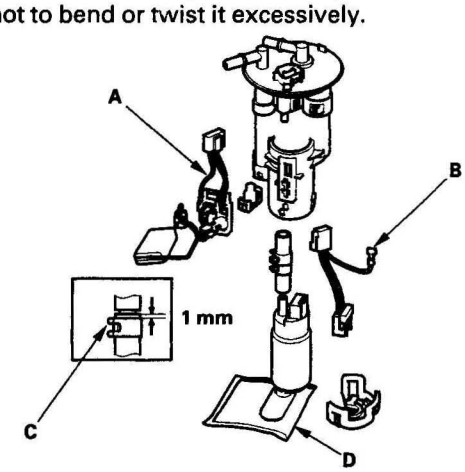


8. Measure resistance between No. 1 and No. 2 terminals with the float at E (EMPTY), 1/2 (HALF FULL), and F (FULL) positions.
If you do not get the following readings, replace the fuel gauge sending unit (A).

Float Position	E	1/2	F
Resistance (Ω)	105–107	29.5–32.5	3–5



9. Install the parts in the reverse order of removal with a new base gasket and new quick connect retainers, then check these items:
   - When connecting the wire harness, make sure the connection is secure and the terminal (B) is firmly locked into place.
   - Check that the tabs of the clamp (C) do not interfere with the wire harness.
   - Do not fold over the lower part of the mesh filter (D).
   - When installing the fuel gauge sending unit (A), make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.



BACK

Protected by AR

Low Fuel Indicator Light Test

1. Do the fuel gauge sending unit test (see page 11-179).

   - If the system is OK, go to step 2.
   - If the system has any malfunction, repair it.

2. Turn the ignition switch ON (II) with the float at the E (EMPTY) position.
   - If the low fuel indicator light is on , go to step 3.
   - If the low fuel indicator light is not on, refer to the low fuel indicator circuit diagram (see page 22-110) and check the circuit.

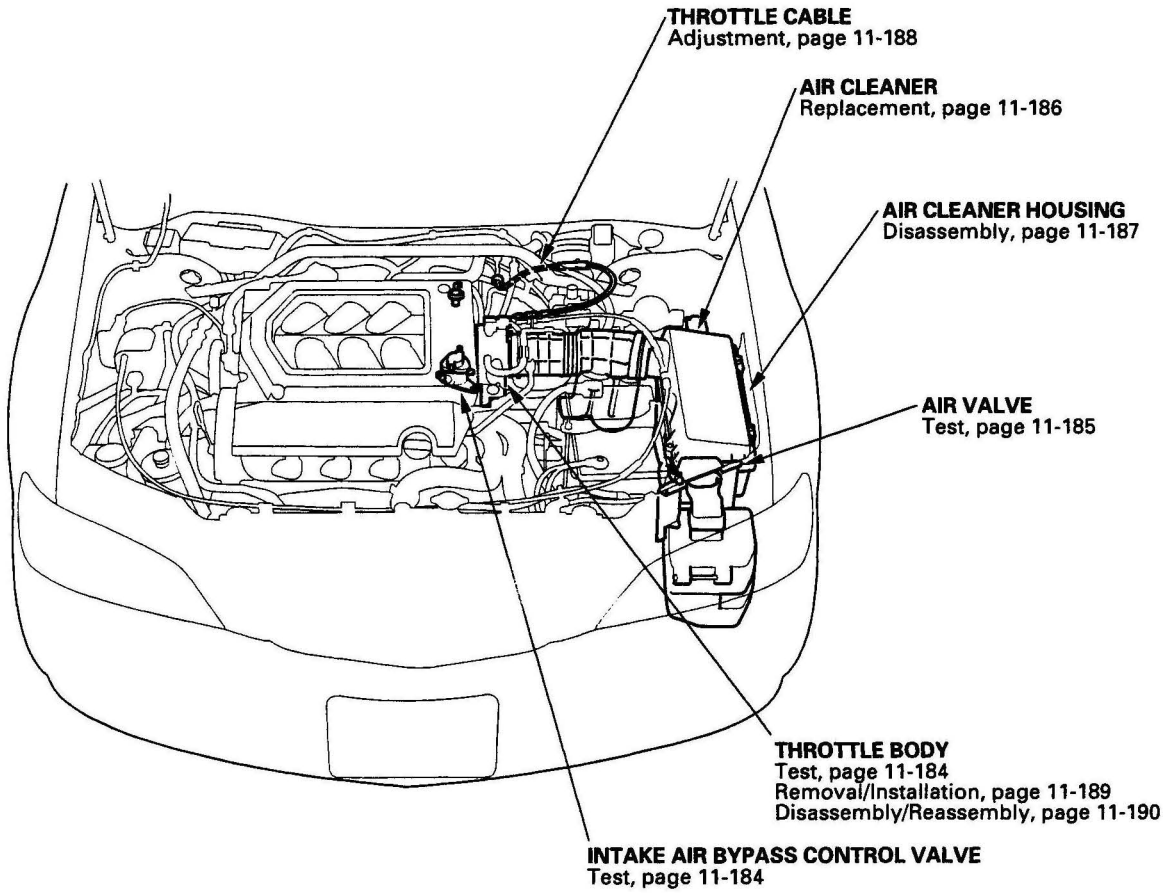
3. Lift the float above the LOW position.
   - If the low fuel indicator light goes off, the system is OK.
   - If the low fuel indicator light is still on, refer to the low fuel indicator circuit diagram (see page 22-110) and check the circuit.

Protected by AR

Component Location Index

J32A1 Engine

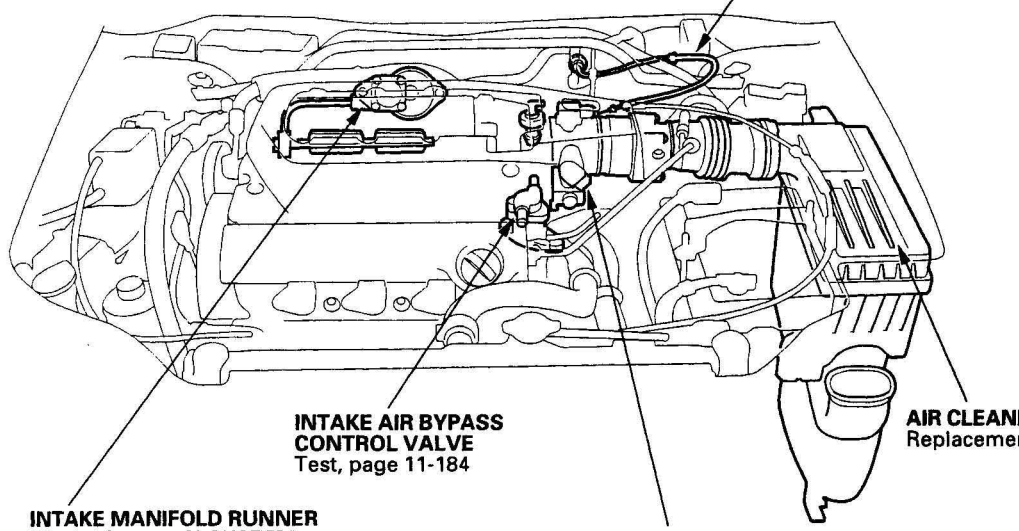
NOTE: The illustlation shows the '99 model.



BACK

Protected by AR

J32A2 Engine



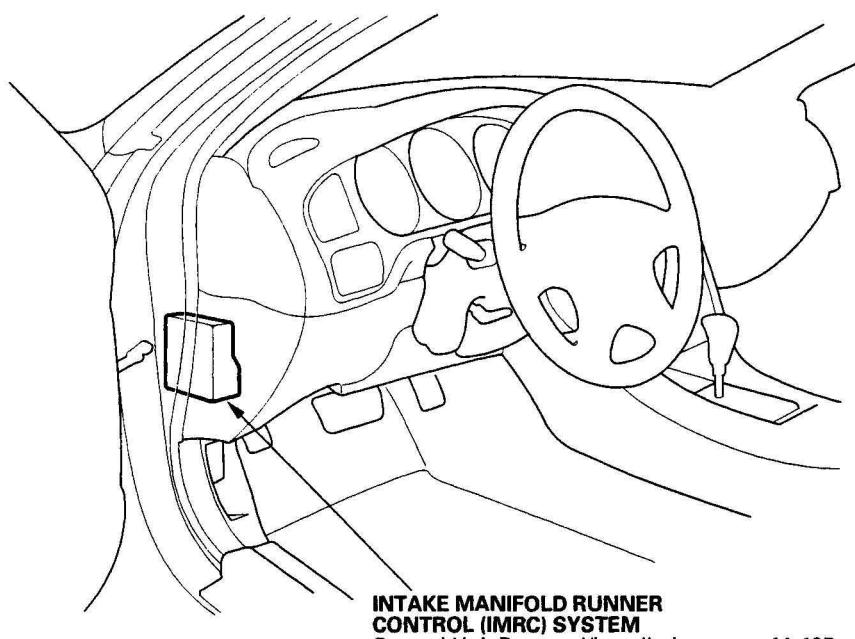
THROTTLE CABLE
Adjustment, page 11-188

INTAKE AIR BYPASS CONTROL VALVE
Test, page 11-184

AIR CLEANER
Replacement, page 11-186

INTAKE MANIFOLD RUNNER CONTROL (IMRC) SYSTEM
Troubleshooting, page 11-191
Valve Inspection, page 11-193
Control Cable Adjustment, page 11-194
Control Actuator Removal/Installation, page 11-194

THROTTLE BODY
Test, page 11-184
Removal/Installation, page 11-189
Disassembly/Reassembly, page 11-190



INTAKE MANIFOLD RUNNER CONTROL (IMRC) SYSTEM
Control Unit Removal/Installation, page 11-195

Protected by AR

Throttle Body Test

NOTE:
- Do not adjust the throttle stop screw. It is preset at the factory.
- If the Malfunction Indicator Lamp (MIL) has been reported on, check for Diagnostic Trouble Codes (DTCs) (see page 11-3).

1. With the engine off, check the throttle cable movement. The cable should move without binding or sticking.

   - If the cable moves OK, go to step 2.
   - If the cable binds or sticks, check it and its routing. If it's faulty, reroute it, or replace it and adjust it (see page 11-188), then go to step 2.

2. Move the throttle lever by hand to see if the throttle valve and/or shaft are too loose or too tight.

   - If there is excessive play in the throttle valve shaft, or any binding in the throttle valve at the fully closed position, replace the throttle body (see page 11-189).
   - If the throttle valve and shaft are OK, go to step 3.

3. Connect the scan tool to the Data Link Connector (DLC).

4. Turn the ignition switch ON (II).

5. Check the throttle position with the scan tool. There should be about 10 % when the throttle is fully closed and about 90 % when the throttle is fully opened.

   - If the throttle position is correct, the throttle body is OK.
   - If the throttle position is not correct, replace the throttle body (see page 11-189).

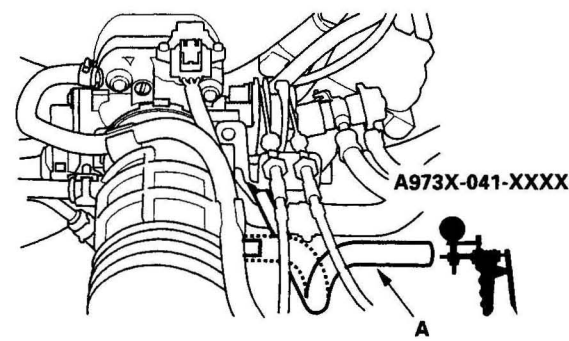
Intake Air Bypass Control Valve Test

Special Tools Required:
Vacuum pump gauge, 0 – 30 in.Hg
A973X-041-XXXXX

1. Start the engine, and let it idle.

   NOTE: The engine coolant temperature must be below 104°F (40°C).

2. Remove the vacuum hose (A) from the intake pipe, and connect a vacuum gauge to the hose.



3. Raise and lower the engine speed, and make sure the vacuum gauge reading changes as the rpm changes.

   If the vacuum reading does not change, check for these problems:

   - Misrouted, leaking, broken, or clogged intake air bypass control system vacuum lines.
   - A cracked or defective intake air bypass control valve.

4. Hold the engine at 3,000 rpm with no load (transmission in Park or neutral position) until the radiator fan comes on, then let it idle.

5. Raise and lower the engine speed, and make sure the vacuum gauge reading does not change as the rpm changes.

   If the vacuum reading changes check for these problems:

   - Misrouted, leaking, broken, or clogged intake air bypass control system vacuum lines.
   - A cracked or defective intake air bypass control valve.

BACK

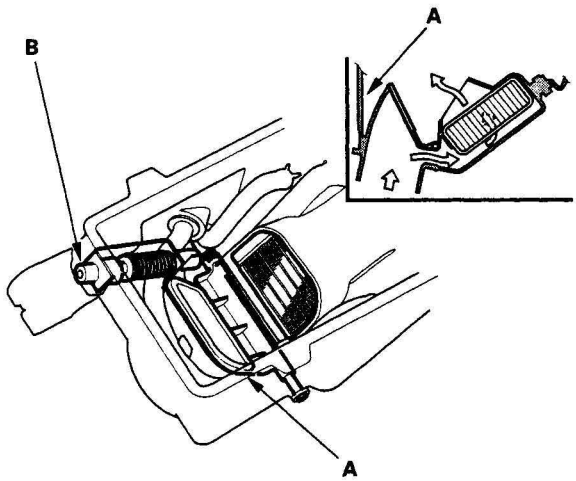
Protected by AR

Heated Air Induction System Test

1. Remove the air cleaner housing cover and air cleaner element.

2. Check the air valve (A). The door should be open temperature at the wax element (B) is below 27°F (−3°C).

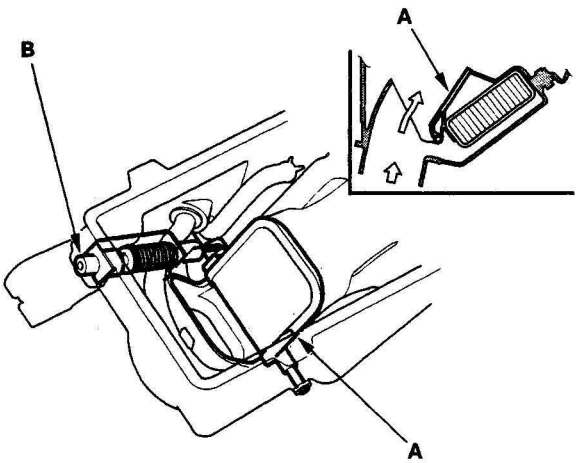
   - If the valve is open, go to step 3.
   - If the valve is not open, check the shaft for binding or sticking. If it is OK, replace the air cleaner housing.



3. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.

4. Check the air valve (A). The air valve should be closed when the temperature at the wax element (B) is above 50°F (10°C).

   - If the air valve is closed, the heated air induction system is OK.
   - If the air valve is not closed, check the shaft for binding or sticking. If it is OK, replace the air cleaner housing.

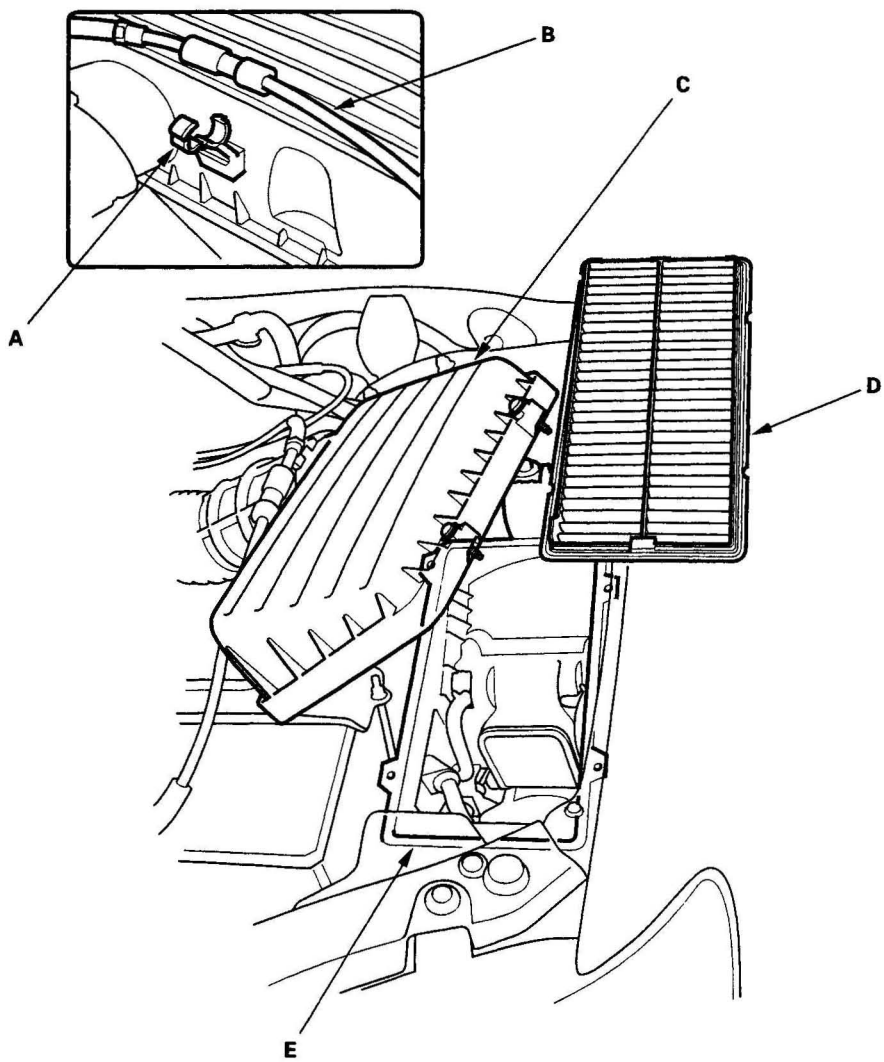


BACK

Protected by AR

Air Cleaner Element Replacement

1. Open the cable clamp (A), and remove the throttle cable (B) from the air cleaner housing cover (C).
2. Remove the air cleaner element (D) from the air cleaner housing (E).
3. Install the parts in the reverse order of removal.

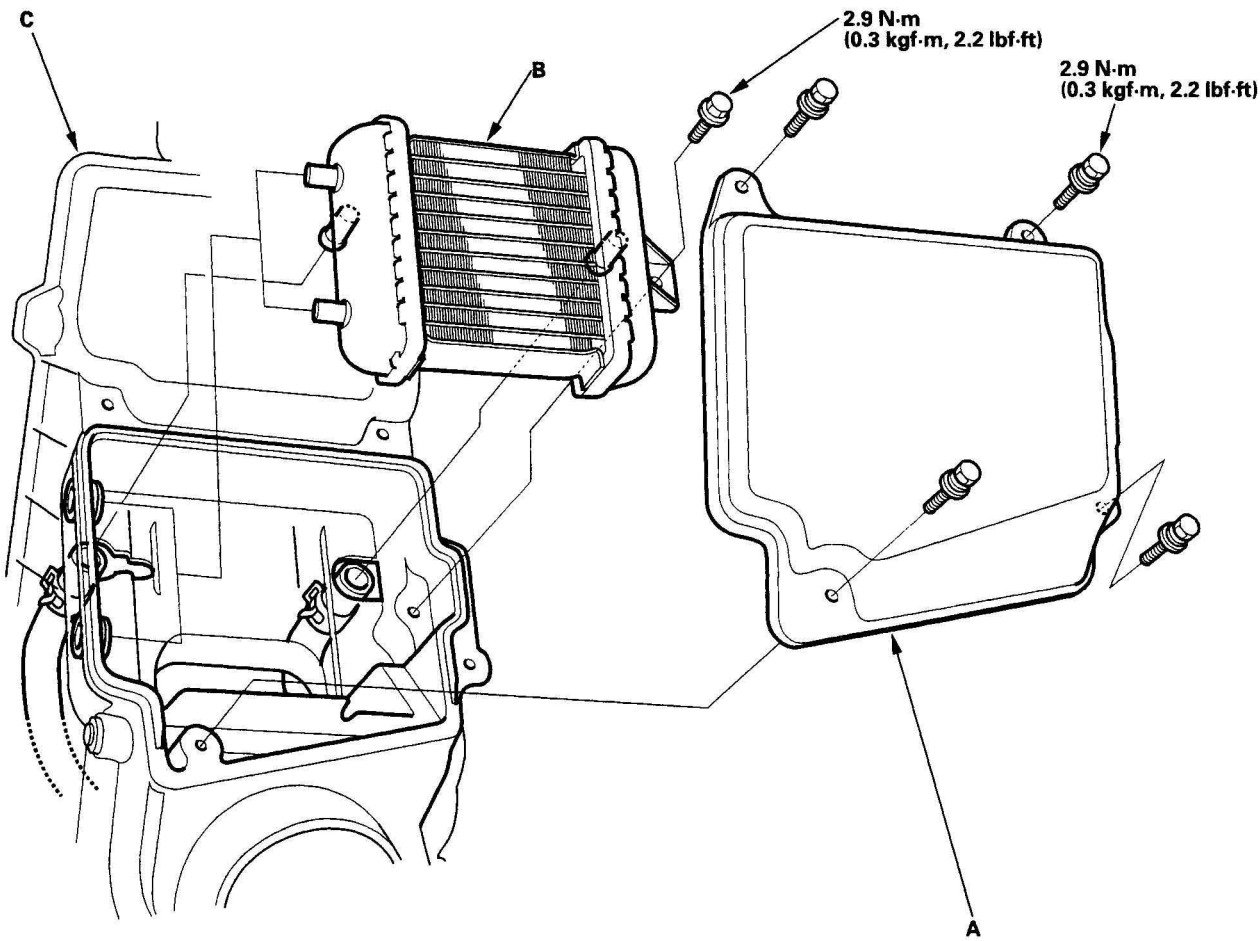


BACK

Protected by AR

Air Cleaner Housing Disassembly/Reassembly - '99 Model

1. Drain the coolant (see page 10-13).
2. Remove the air cleaner housing.
3. Remove the cover (A) and radiator (B) from the air cleaner housing (C).

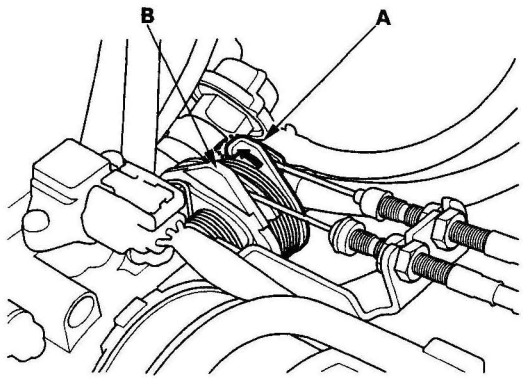


4. Install the parts in the reverse order of removal.
5. Fill the coolant (see page 10-13).

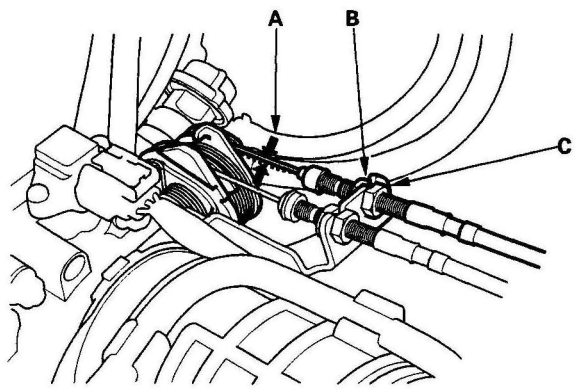
Protected by AR

Throttle Cable Adjustment

1. Push the throttle link (A) toward the throttle lever (B) until there is no clearance.



2. Check cable free play at the throttle linkage. Cable deflection (A) should be 10—12 mm (3/8—1/2 in.)



3. If deflection is not within specs (10—12 mm, 3/8—1/2 in.) loosen the locknut (B), turn the adjusting nut (C) until the deflection is as specified, then retighten the locknut.

4. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

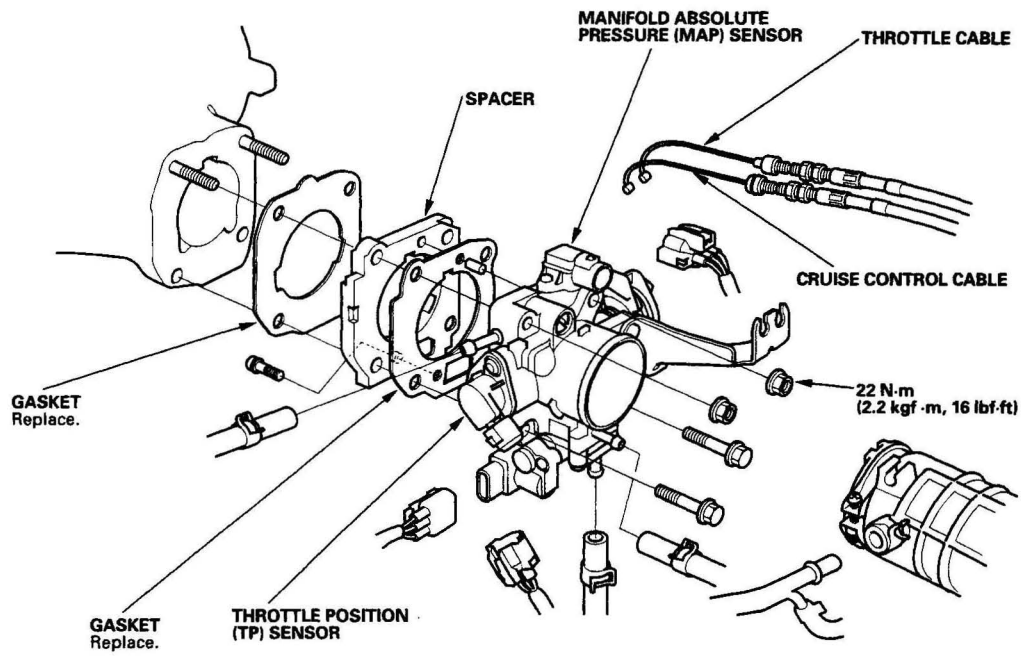
BACK

Protected by AR

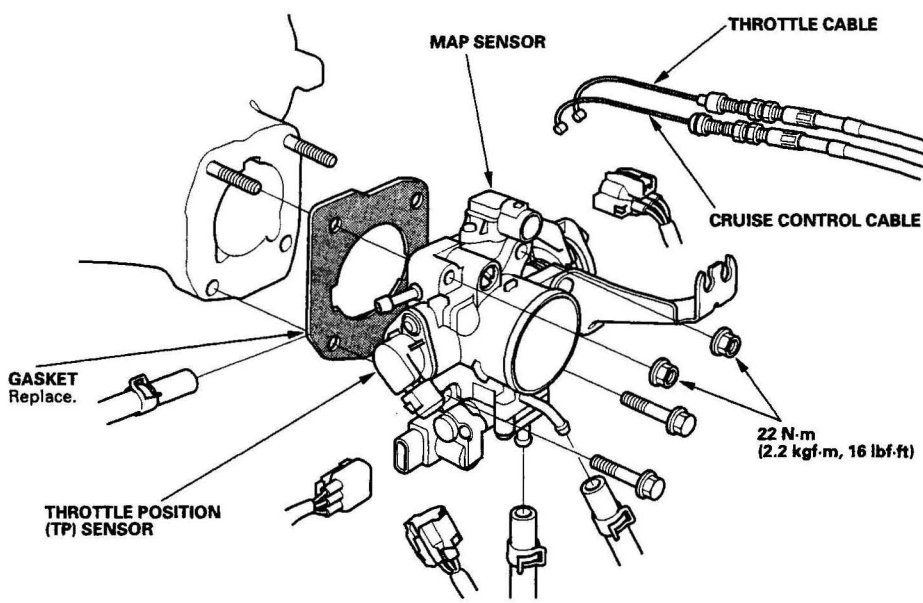
Throttle Body Removal/Installation

NOTE:
- Do not adjust the throttle stop screw.
- After reassembly, adjust the cruise control cable (see page 4-44), and the throttle cable (see page 11-188).
- The Throttle Position (TP) sensor is not removable or adjustable.

J32A1 engine:



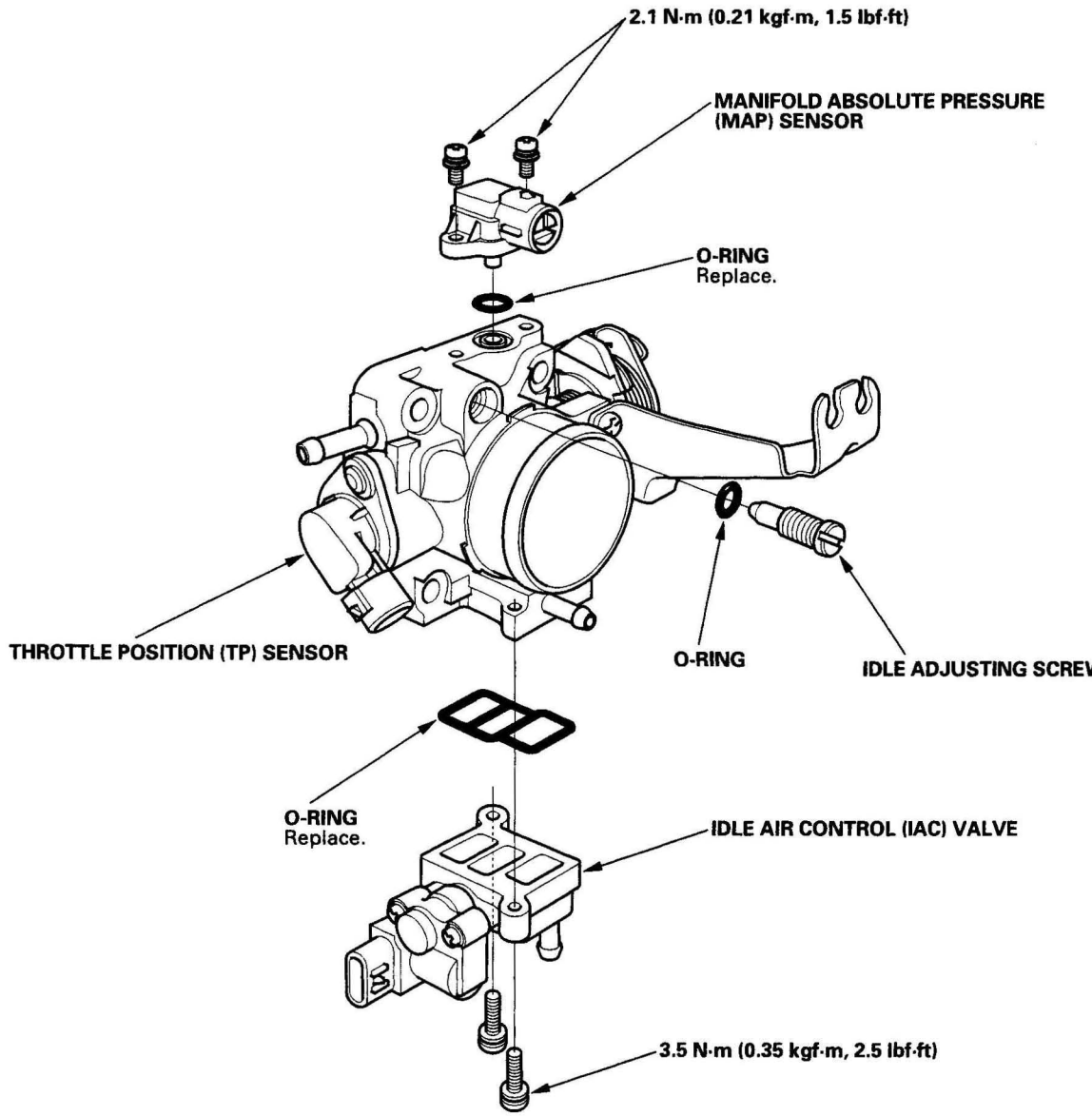
J32A2 engine:



BACK

Protected by AR

Throttle Body Disassembly/Reassembly



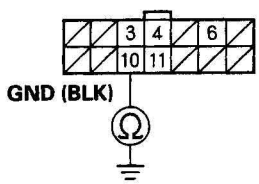
BACK

Protected by AR

IMRC System Troubleshooting - J32A2 Engine

1. Disconnect the IMRC module 14P connector.
2. Check for continuity between the IMRC module 14P connector terminal No. 10 and body ground.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

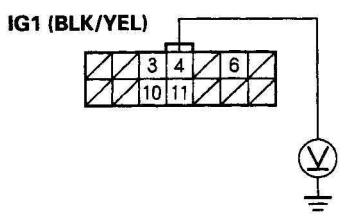
Is there continuity?

YES – Go to step 3.

NO – Repair open in the wire between the IMRC module 14P connector and G302. ■

3. Turn the ignition switch ON (II).
4. Measure voltage between the IMRC module 14P connector terminal No. 4 and body ground.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 6.

NO – Go to step 5.

5. Check the No. 6 PCM (15A) fuse in the driver's under-dash fuse/relay box.

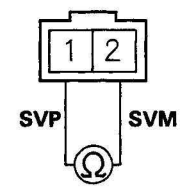
Is the fuse blown?

YES – Replace the No. 6 PCM (15A) fuse in the driver's under-dash fuse/relay box. If the fuse blows again, repair short in the wire between the IMRC module and the No. 6 PCM (15A) fuse in the driver's under-dash fuse/relay box. ■

NO – Repair open in the wire between the IMRC module and the No. 6 PCM (15 A) fuse in the driver's under-dash fuse/relay box. ■

6. Turn the ignition switch OFF.
7. Disconnect the IMRC actuator 2P connector.
8. Measure resistance between the IMRC actuator 2P connector terminals No. 1 and No. 2.

IMRC ACTUATOR TERMINALS



Terminal side of male terminals

Is there 2 – 5 Ω ?

YES – Go to step 9.

NO – Replace the IMRC actuator. ■

9. Reconnect the IMRC actuator 2P connector.

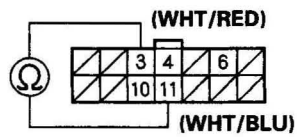
(cont'd)

Protected by AR

IMRC System Troubleshooting - J32A2 Engine (cont'd)

10. Measure resistance between IMRC module 14P connector terminals No. 3 and No. 11.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

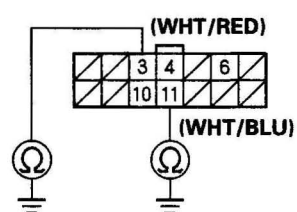
Is there 2–5 Ω ?

YES—Go to step 13.

NO—Go to step 11.

11. Disconnect the IMRC actuator 2P connector.
12. Check for continuity between the IMRC module 14P connector terminal No. 3 and No. 11 and body ground individually.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

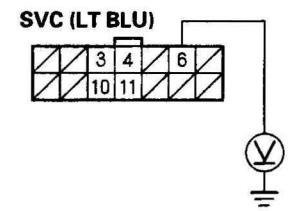
Is there continuity?

YES—Repair short in the wire between the IMRC module and the IMRC actuator. ■

NO—Repair open in the wire between the IMRC module and the IMRC actuator. ■

13. Start the engine.
14. Measure voltage between the IMRC module 14P connector terminal No. 6 and body ground.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

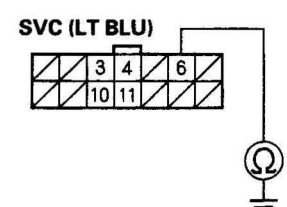
Is there 5 V with engine speed below 3,500 rpm, and is there 0 V with engine speed above 4,000 rpm?

YES—Replace the IMRC module. ■

NO—Go to step 15.

15. Turn the ignition switch OFF.
16. Disconnect PCM connector A (32P).
17. Check for continuity between the IMRC module 14P connector No. 6 terminal and body ground.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the IMRC module and the PCM. ■

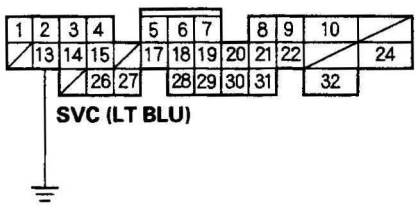
NO—Go to step 18.

BACK

Protected by AR

18. Connect PCM connector terminal A13 to body ground with a jumper wire.

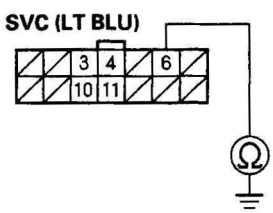
PCM CONNECTOR A (32P)



Wire side of female terminals

19. Check for continuity between IMRC module 14P connector terminal No. 6 and body ground.

IMRC MODULE 14P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

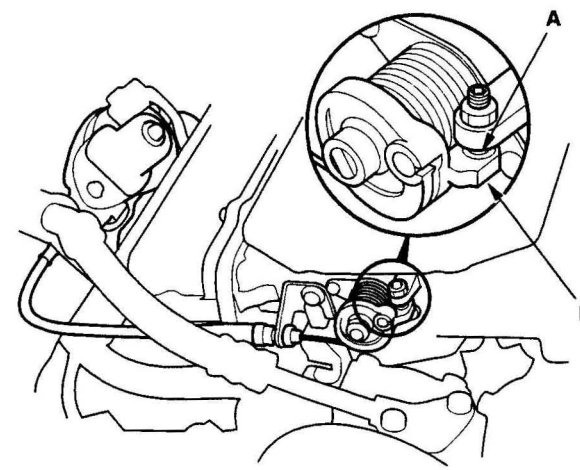
NO—Repair open in the wire between the IMRC module and the PCM.■

Intake Manifold Runner Control (IMRC) Valve Inspection - J32A2 Engine

NOTE: Do not adjust the IMRC adjusting screw (A).

1. Check for clearance between the stopper (B) and the screw (A). There should be no clearance.

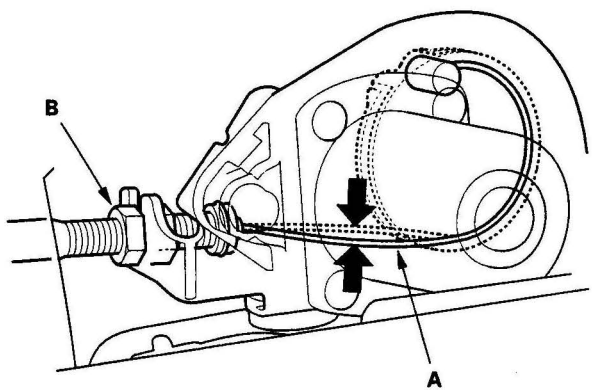
   - If there is a clearance, check and adjust the IMRC actuator cable.
   - If there is clearance after adjusting the IMRC actuator cable, the linkage may be stuck. Remove the intake manifold (see page 9-2), then check the IMRC valve.



Protected by AR

Intake Manifold Runner Control (IMRC) Cable Adjustment - J32A2 Engine

1. Inspect the IMRC actuator cable (A). If the cable is damaged, replace it.



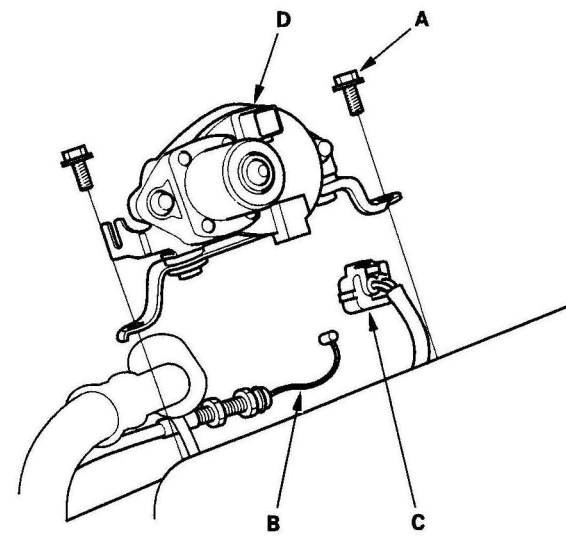
2. Inspect the cable free play.

   Cable free play should be: 3±2 mm (1/8 ± 1/16 in.)

   If the cable free play is out of specification, loosen the lock nut (B), then adjust the cable.

Intake Manifold Runner Control (IMRC) Actuator Removal/ Installation - J32A2 Engine

1. Remove the bolts (A), IMRC actuator cable (B), and IMRC actuator 2P connector (C).
2. Remove the IMRC actuator (D).



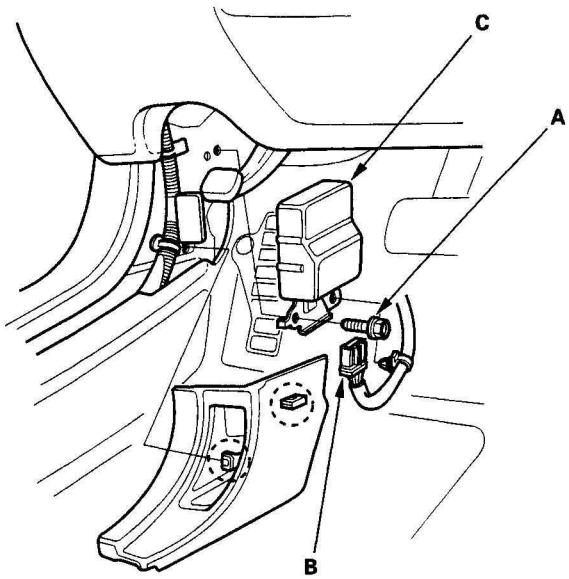
3. Install the parts in the reverse order of removal.

BACK

Protected by AR

Intake Manifold Runner Control (IMRC) Module Removal/Inspection - J32A2 Engine

1. Remove the bolt (A) and the IMRC 14P connector (B).
2. Remove the IMRC module (C).



3. Install the parts in the reverse order of removal.

Protected by AR

DTC Troubleshooting

DTC P0420: Catalytic System Efficiency Below Threshold

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0420, troubleshoot those DTCs first, then recheck for DTC P0420.

P0137, P0138: Secondary Heated Oxygen Sensor (secondary HO2S) (Sensor 2)
P0141: Secondary HO2S (Sensor 2) heater

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Drive for about 10 minutes without stopping on a highway or freeway. Your speed can vary.
4. With the transmission in D5 position ('99 model: D4 position), drive at a steady speed between 50—62 mph (80—100 km/h) for 30 seconds.
5. Do step 4 three times. Between each procedure, close the throttle completely for 1—2 seconds. If the engine is stopped during this procedure, go to step 3 and do the procedure again.
6. Check for the three way catalytic converter (TWC) test result with the scan tool.

   Does the scan tool indicate FAIL?

   YES—Check the TWC. If necessary, replace the TWC.■

   NO—Intermittent failure, system is OK at this time.■

Tailpipe Emissions Test

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Connect a tachometer.
3. Check and, if necessary, adjust the idle speed (see page 11-157).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.

   On Canadian models, pull the parking brake lever up, start the engine, then check that the headlights are off.

   The CO meter should indicate 0.1 % maximum.

BACK

Protected by AR

DTC Troubleshooting

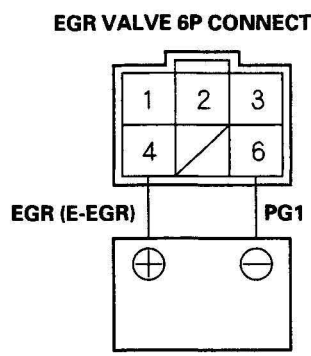
DTC P0401: EGR Insufficient Flow

1. Reset the PCM (see page 11-4).
2. Test-drive under the following conditions.
   - Without any electrical load.
   - Decelerate from 55 mph (88 km/h) for at least 5 seconds.
3. Check the Temporary DTC with the scan tool.

   Is Temporary DTC P0401 indicated?

   YES—Clean the intake manifold EGR port with carburetor cleaner. Clean the passage inside the EGR valve with carburetor cleaner or replace the EGR valve.■

   NO—Intermittent failure, go to step 3.
4. Turn the ignition switch OFF.
5. Disconnect the EGR valve 6P connector.
6. Connect the battery positive terminal to EGR valve connector terminal No. 4.



Terminal side of male terminals

7. Start the engine and let it idle, then connect the battery negative terminal to EGR valve connector terminal No. 6.

   Did the engine stall or run rough?

   YES—Intermittent failure, system is OK at this time. ■

   NO—Clean the intake manifold EGR port with caburetor cleaner. Clean the passage inside the EGR valve with carburetor cleaner or replace the EGR valve.■

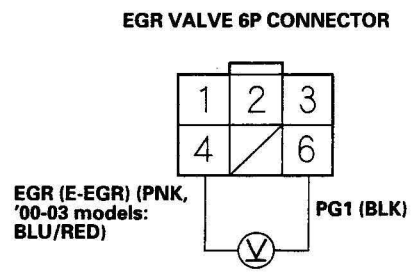
DTC P1491: EGR Valve Insufficient Lift

1. Reset the PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on.
3. Drive the vehicle on the load for about 10 minutes. Try to keep the engine speed in the 1,700—2,500 rpm range.
4. Check the Temporary DTC with the scan tool.

   Is Temporary DTC P1491 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the EGR valve and the PCM.■
5. Turn the ignition switch OFF.
6. Disconnect the EGR valve 6P connector.
7. Start the engine and let it idle.
8. Measure voltage between EGR valve 6P connector terminals No. 4 and No. 6.



Wire side of female terminals

   Is there battery voltage?

   YES—Substitute a known-good PCM, and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

   NO—Go to step 9.
9. Turn the ignition switch OFF.

(cont'd)

BACK

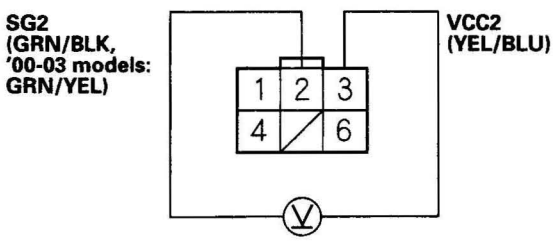
Protected by AR

DTC Troubleshooting (cont'd)

10. Turn the ignition switch ON (II).

11. Measure voltage between EGR valve 6P connector terminals No. 2 and No. 3.

EGR VALVE 6P CONNECTOR



Wire side of female terminals

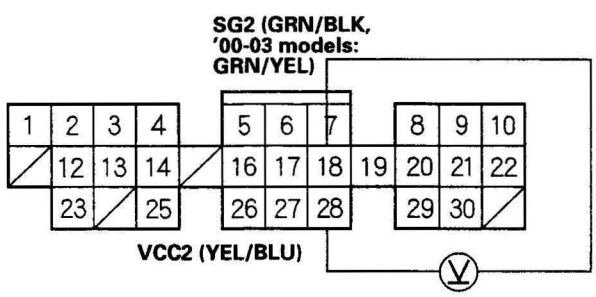
Is there about 5 V?

YES – Go to step 13.

NO – Go to step 12.

12. Measure voltage between PCM connector terminals C18 and C28.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about 5 V?

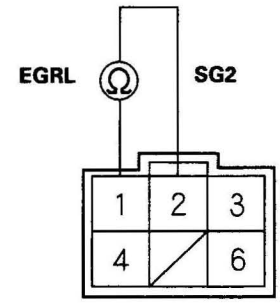
YES – Repair open in the wire between the EGR valve and the PCM (C18). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

13. Turn the ignition switch OFF.

14. At the sensor side, measure resistance between EGR valve 6P connector terminals No. 1 and No. 2.

EGR VALVE 6P CONNECTOR



Terminal side of male terminals

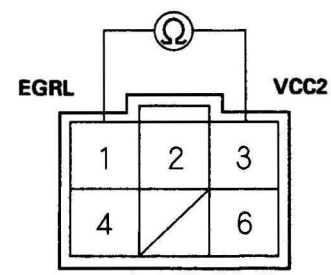
Is there continuity or resistance of 100 kΩ or higher?

YES – Replace the EGR valve. ■

NO – Go to step 15.

15. Measure resistance between EGR valve 6P connector terminals No. 1 and No. 3.

EGR VALVE 6P CONNECTOR



Terminal side of male terminals

Is there 100 kΩ or higher?

YES – Replace the EGR valve. ■

NO – Go to step 16.

16. Reconnect the EGR valve connector.

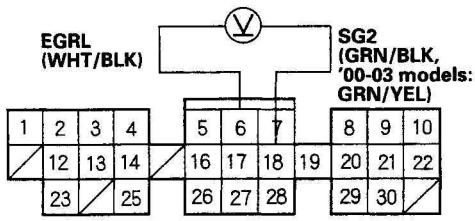
17. Turn the ignition switch ON (II).

BACK

Protected by AR

18. Measure voltage between the PCM connector terminals C6 and C18.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about 1.2 V?

YES – Go to step 22.

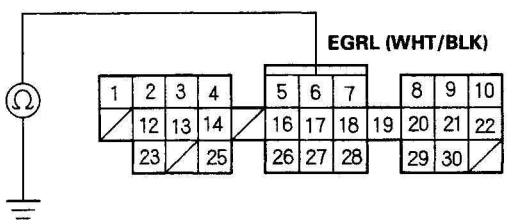
NO – Go to step 19.

19. Turn the ignition switch OFF.

20. Disconnect PCM connector C (31P) and EGR valve 6P connector.

21. Check for continuity between PCM connector terminal C6 and the body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the EGR valve and PCM (C6). ■

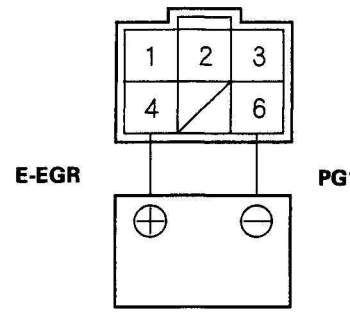
NO – Repair open in the wire between the EGR valve and PCM (C6). ■

22. Turn the ignition switch OFF.

23. Disconnect the EGR valve 6P connector.

24. Connect battery positive terminal to EGR valve 6P connector terminal No. 4.

EGR VALVE 6P CONNECTOR



Terminal side of male terminals

25. Start the engine and let it idle, then connect the battery negative terminal the to EGR valve 6P connector terminal No. 6.

Does the engine stall or run rough?

YES – Go to step 26.

NO – Replace the EGR valve. ■

26. Turn the ignition switch OFF.

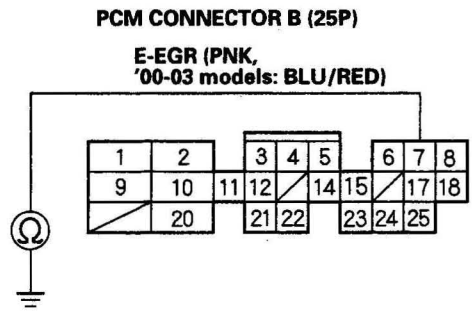
27. Disconnect the PCM connector B (25P).

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

28. Check for continuity between PCM connector terminal B7 and EGR valve 6P connector terminal No. 4.



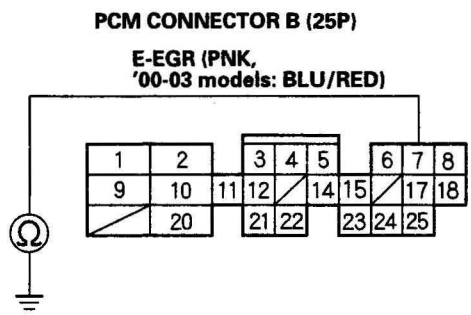
Wire side of female terminals

Is there continuity?

YES – Go to step 27.

NO – Repair open in the wire between the EGR valve and the PCM (B7).■

29. Check for continuity between PCM connector terminal B7 and body ground.



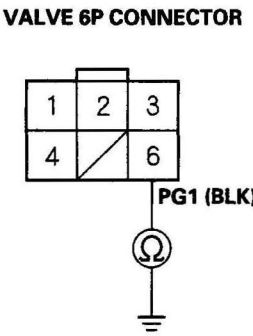
Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the EGR valve and the PCM (B7).■

NO – Go to step 28.

30. Check for continuity between EGR valve 6P connector terminal No. 6 and body ground.



Wire side of female terminals

Is there continuity?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM.■

NO – Repair open in the wire between the EGR valve and G101.■

BACK

Protected by AR

DTC P1498: EGR Valve Position Sensor Circuit High Voltage

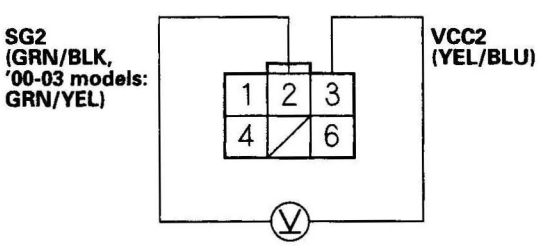
1. Reset the PCM (see page 11-4).
2. Start the engine.

   Is DTC P1498 indicated?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the EGR valve and the PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the EGR valve 6P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between EGR valve 6P connector terminals No. 2 and No. 3.

EGR VALVE 6P CONNECTOR



Wire side of female terminals

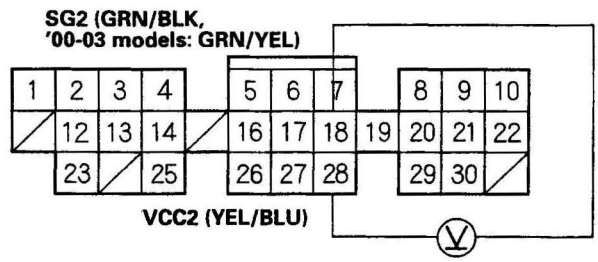
Is there about 5 V?

YES – Replace the EGR valve. ■

NO – Go to step 7.

7. Measure voltage between PCM connector terminals C18 and C28.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about 5 V?

YES – Repair open in the wire between the EGR valve and the PCM (C18). ■

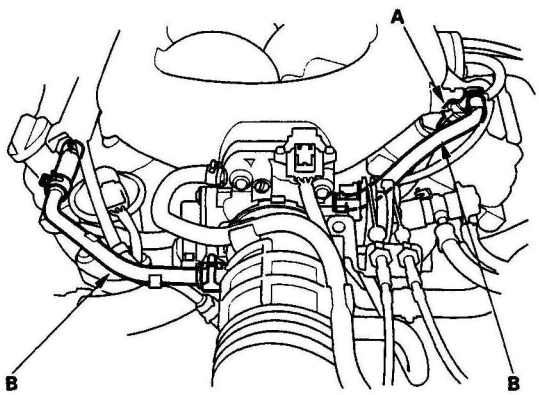
NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

Protected by AR

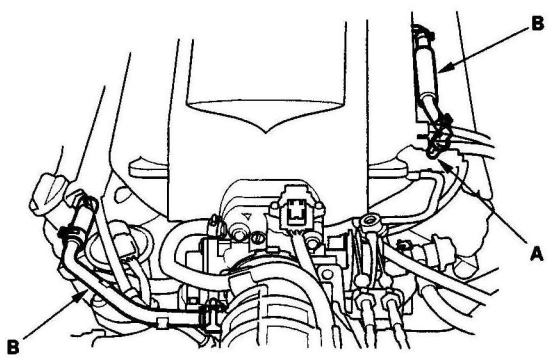
PCV Valve Inspection and Test

1. Check the PCV valve (A), hoses (B), and connections for leaks or restrictions.

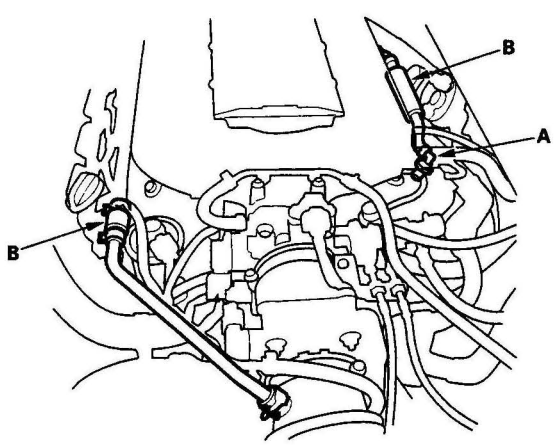
J32A1 Engine
'99 model:



'00-03 models:

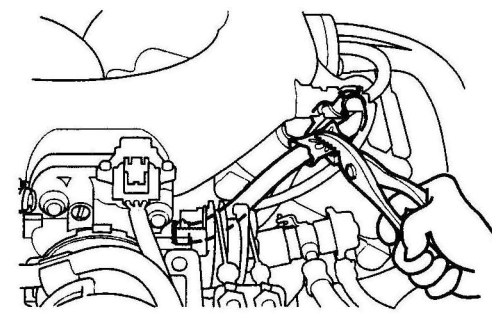


J32A2 Engine

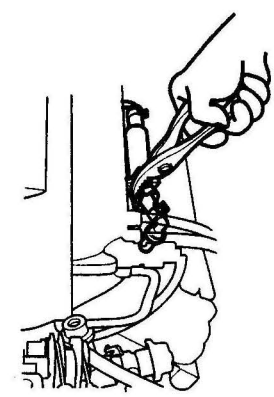


2. At idle, make sure there is a clicking sound from the PCV valve when the hose between the PCV valve and intake manifold is lightly pinched (A) with your fingers or pliers.
If there is no clicking sound, check the PCV valve grommet for cracks or damage. If the grommet is OK, replace the PCV valve and recheck.

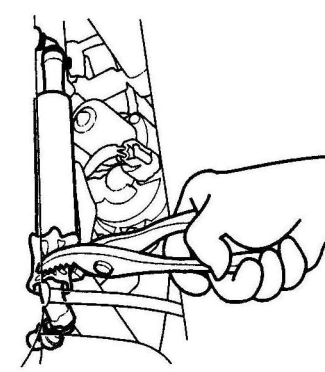
J32A1 Engine
'99 model:



'00-03 models:



J32A2 Engine

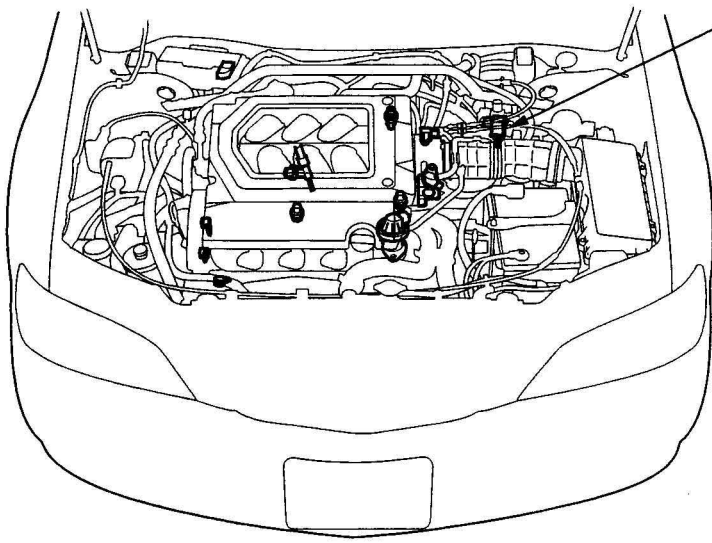


BACK

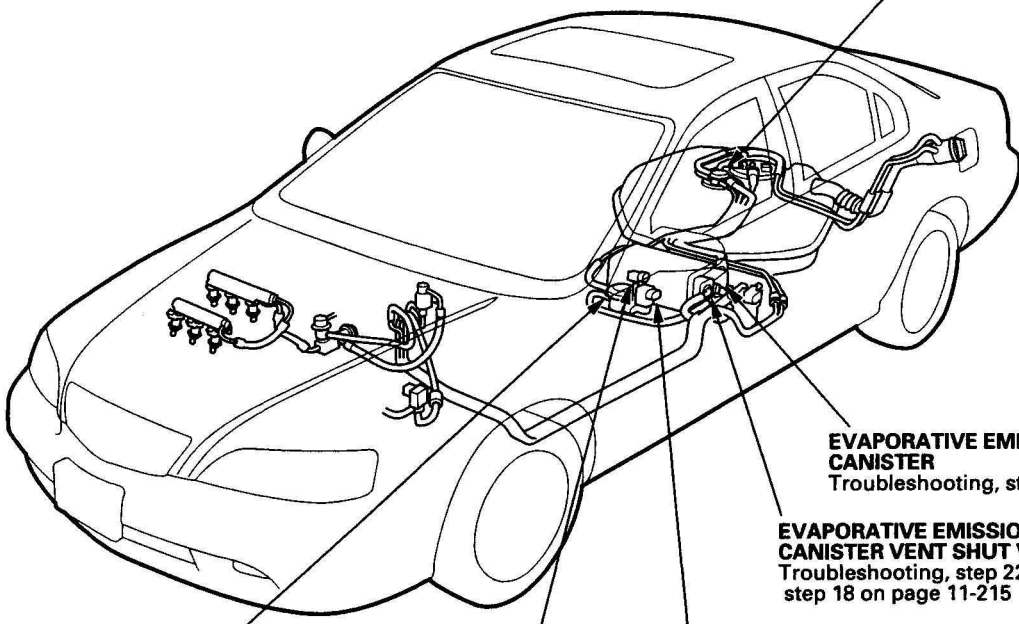
Protected by AR

Component Location Index

NOTE: The illustlation shows '00-03 models.



EVAPORATIVE EMISSON (EVAP) CANISTER PURGE VALVE
Troubleshooting, step 3 on page 11-208, step 1 on page 11-213



FUEL TANK VAPOR CONTROL VALVE
Test, page 11-219
Replacement, page 11-221

EVAPORATIVE EMISSION (EVAP) CANISTER
Troubleshooting, step 27 on page 11-216

EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE
Troubleshooting, step 22 on page 11-211, step 18 on page 11-215

EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
Troubleshooting, step 11 on page 11-209, step 10 on page 11-214

EVAPORATIVE EMISSON (EVAP) TWO WAY VALVE
Test, page 11-218

FUEL TANK PRESSURE (FTP) SENSOR
Troubleshooting, page 11-204

BACK

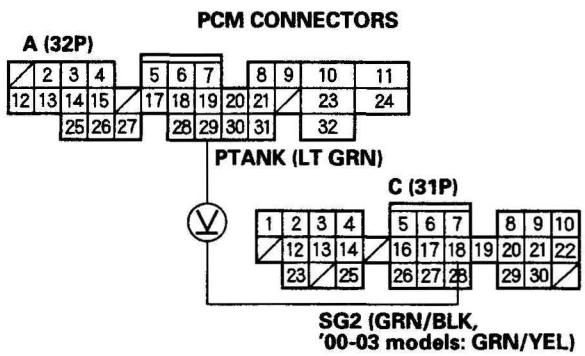
Protected by AR

DTC Troubleshooting

DTC P0451: FTP Sensor Range/Performance Problem

Special Tools Required
Vacuum Pump/Gauge, 0–30 in. Hg A973X-041-XXXXX

1. Remove the fuel fill cap.
2. Turn the ignition switch ON (II).
3. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between PCM connector terminals A29 and C18.



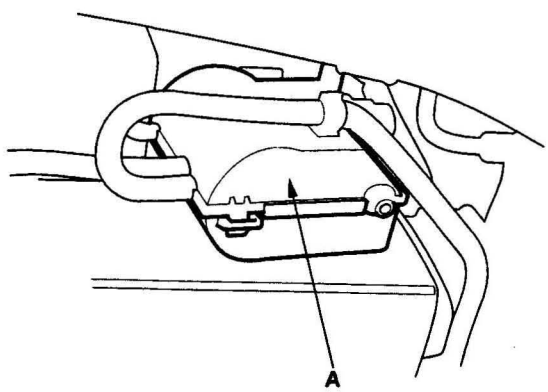
Wire side of female terminals

Is there about 2.5 V?

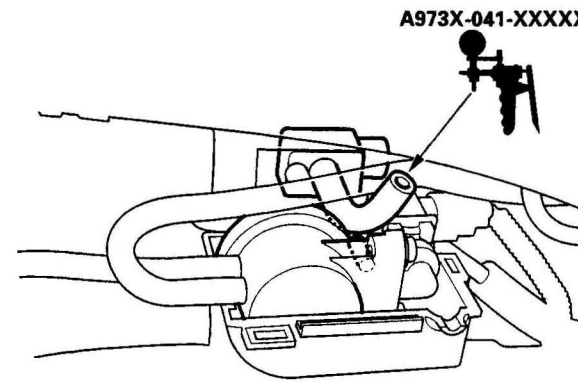
YES—Go to step 4.

NO—Replace the FTP sensor. ■

4. Turn the ignition switch OFF.
5. Open the fuel vent assembly cover (A) in front of the EVAP canister.



6. Disconnect the hose between the EVAP two way valve and the FTP sensor at the EVAP two way valve end.
7. Connect a vacuum pump to the open end of that hose.



8. Turn the ignition switch ON (II).
9. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between PCM connector terminals A29 and C18, and slowly squeeze the vacuum pump a little while watching the voltage.
10. The voltage should smoothly drop from about 2.5 V down to about 1.5 V. STOP applying vacuum when the voltage drops to about 1.5 V or damage to the FTP sensor may occur.

Does the voltage drop to about 1.5 V and hold?

YES—Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

NO—Replace the FTP sensor. ■

BACK

Protected by AR

DTC P0452: FTP Sensor Circuit Low Voltage

1. Check the vacuum lines at the FTP sensor for misrouting, leakage, breakage and clogging.

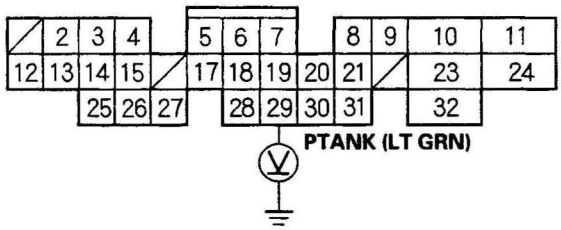
   Are the vacuum lines OK?

   YES—Go to step 2.

   NO—Repair or replace vacuum lines as necessary.■

2. Reset the PCM (see page 11-4).
3. Remove the fuel fill cap.
4. Turn the ignition switch ON (II).
5. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between body ground and PCM connector terminal A29.

PCM CONNECTOR A (32P)



Wire side of female terminals

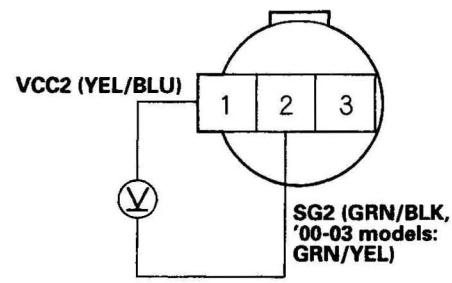
Is there about 2.5 V?

YES—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the FTP sensor and the PCM.■

NO—Go to step 6.

6. Turn the ignition switch OFF.
7. Reinstall the fuel fill cap.
8. Disconnect the FTP sensor 3P connector.
9. Turn the ignition switch ON (II).
10. Measure voltage between FTP sensor 3P connector terminals No. 1 and No. 2.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 11.

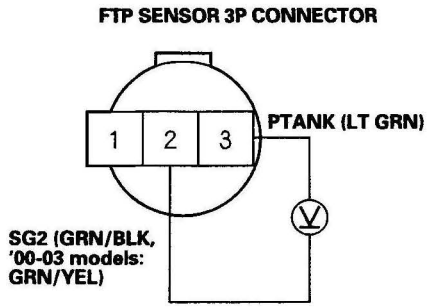
NO—Repair open in the wire between the FTP sensor and the PCM (C28).■

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

11. Measure voltage between FTP sensor 3P connector terminals No. 2 and No. 3.



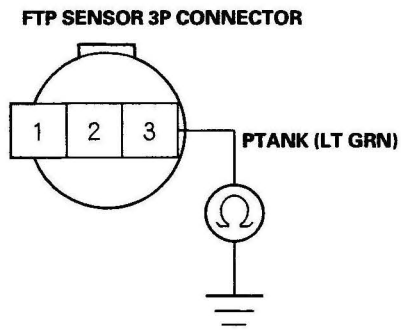
Wire side of female terminals

Is there about 5 V?

YES—Replace the FTP sensor.■

NO—Go to step 12.

12. Turn the ignition switch OFF.
13. Disconnect the PCM connector A (32P).
14. Check for continuity between FTP sensor 3P connector terminal No. 3 and body ground.



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the FTP sensor and PCM (A29).■

NO—Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM.■

DTC P0453: FTP Sensor Circuit High Voltage

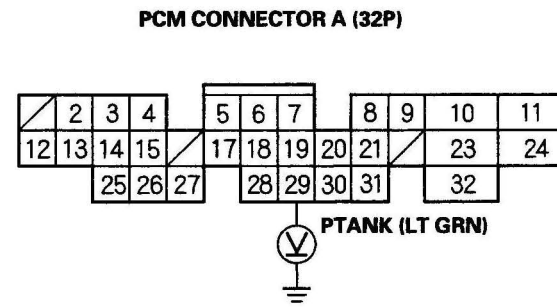
1. Check the vacuum lines of the FTP sensor for misrouting, leakage, breakage, and clogging.

   Are the vacuum lines OK?

   YES—Go to step 2.

   NO—Repair or replace vacuum lines as necessary.■

2. Reset the PCM (see page 11-4).
3. Remove the fuel fill cap.
4. Turn the ignition switch ON (II).
5. Monitor the FTP sensor voltage with the Honda PGM Tester, or measure voltage between body ground and PCM connector terminal A29.



Wire side of female terminals

Is there about 2.5 V?

YES—Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the FTP sensor and the PCM.■

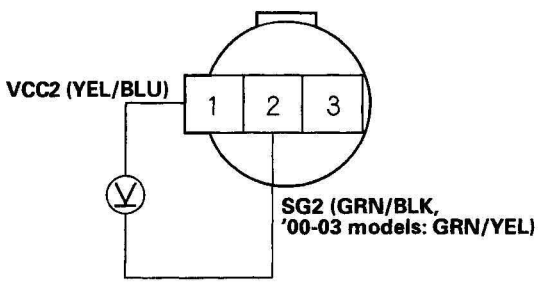
NO—Go to step 6.

BACK

Protected by AR

6. Turn the ignition switch OFF.
7. Reinstall the fuel fill cap.
8. Disconnect the FTP sensor 3P connector.
9. Turn the ignition switch ON (II).
10. Measure voltage between FTP sensor 3P connector terminals No. 1 and No. 2.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

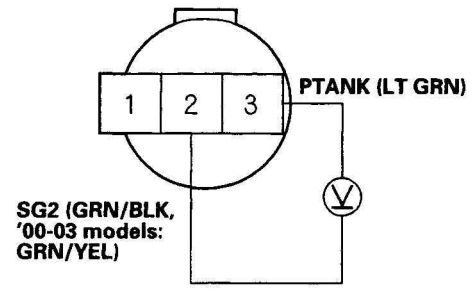
Is there about 5 V?

YES – Go to step 11.

NO – Repair open in the wire between the FTP sensor and the PCM (C18). ■

11. Measure voltage between FTP sensor 3P connector terminals No. 2 and No. 3.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

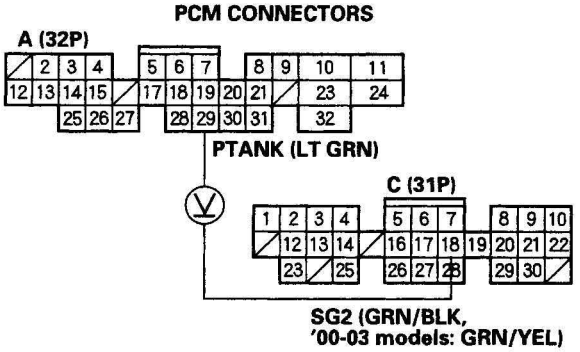
Is there about 5 V?

YES – Replace the FTP sensor. ■

NO – Go to step 12.

12. Measure voltage between PCM connector terminals A29 and C18.

PCM CONNECTORS



Wire side of female terminals

Is there about 5 V?

YES – Repair open in the wire between the FTP sensor and PCM (A29). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If normal voltage is indicated, replace the original PCM. ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P1456: EVAP Control System Leakage (fuel tank system)

NOTICE

The fuel system is designed to allow specified maximum vacuum and pressure conditions. Do not deviate from the vacuum and pressure tests as indicated in these procedures. Excessive pressure/vacuum would damage the EVAP components or cause eventual fuel tank failure.

Special Tools Required

Vacuum Pump/Gauge, 0—30 in. Hg A973X-041-XXXXX

Please note that this is a 2 trip code, once cleared, they cannot be reproduced in 1 trip. Also, certain specific driving and ambient conditions must occur before the PCM will complete the system checks. Additional test drives may still not meet the specific conditions needed to reproduce the codes.

Therefore, follow these troubleshooting procedures carefully to ensure the integrity of the system and to confirm the cause of the problem or code.

NOTE: Fresh fuel has a higher volatility that will create greater pressure/vacuum. The optimum condition for testing is fresh fuel, and must be less than a full tank of gas. If possible, to assist in leak detection, add 1 gallon of fresh fuel to the tank (as long as it will not fill the tank), just before starting these procedures.

Fuel Fill Cap Check

1. Check the fuel fill cap. It must be a gray or black OEM cap and be tightened at least three "clicks" to properly seal the system.

   Is proper fuel fill cap installed and properly tightened?

   YES—Go to step 2.

   NO—Replace or tighten the cap.■

2. Check the fuel fill cap seal.

   Is the fuel fill cap seal missing or damaged?

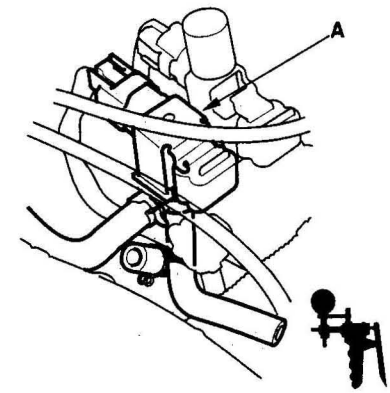
   YES—Replace the fuel fill cap (gray or black colored cap).■

   NO—Fuel fill cap is OK. Go to step 3.

EVAP Canister Purge Valve Test

3. Disconnect the vacuum hose from the EVAP canister purge valve (A), and connect a vacuum pump to the hose.

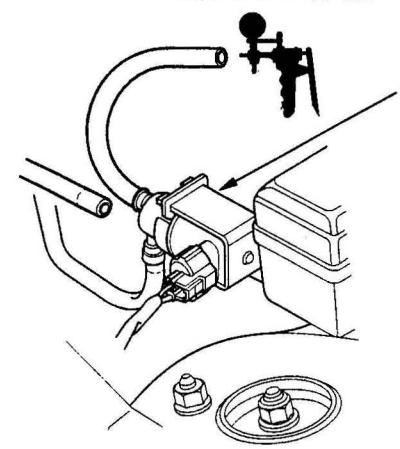
   '99 model:



A973X-041-XXXXX

   '00-03 models:

A973X-041-XXXXX



BACK

Protected by AR

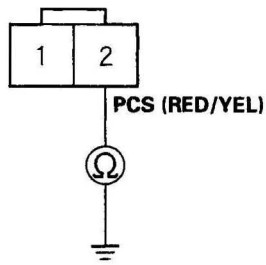
4. Turn the ignition switch ON (II).
5. Apply vacuum to the hose.

   Does the valve hold vacuum?

   YES – EVAP canister purge valve is OK. Go to step 11.

   NO – Go to step 6.
6. Turn the ignition switch OFF.
7. Disconnect the EVAP canister purge valve 2P connector.
8. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

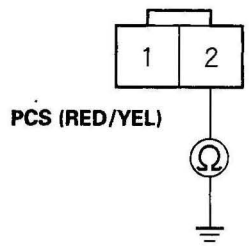
Is there continuity?

YES – Go to step 9.

NO – Replace the EVAP canister purge valve. ■

9. Disconnect the PCM connector A (32P).
10. Check for continuity between EVAP purge control solenoid valve 2P connector terminal No. 2 and body ground.

EVAP PURGE CONTROL SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

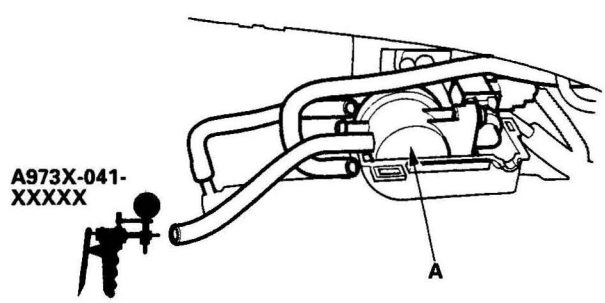
Is there continuity?

YES – Repair short in the wire between the EVAP purge control solenoid valve and PCM (A6). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

EVAP Bypass Solenoid Valve Test

11. Disconnect the vacuum hoses from the EVAP two way valve (A), and connect a vacuum pump to the hose.

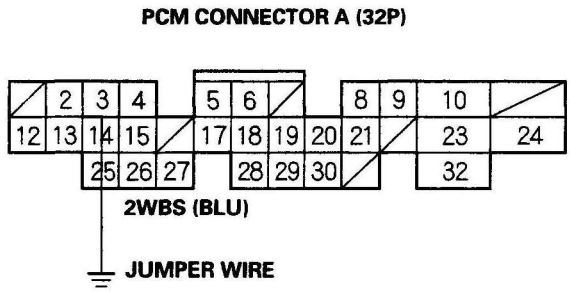


(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

12. Connect the PCM connector teminal A3 to body ground with a jumper wire.



13. Turn the ignition switch ON (II).

14. Apply vacuum to the hose.

Does the valve hold vacuum?

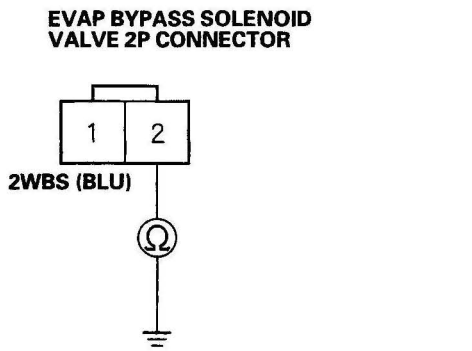
YES – Go to step 15.

NO – Go to step 20.

15. Turn the ignition switch OFF.

16. Disconnect the EVAP bypass solenoid valve 2P connector.

17. Check for continuity between EVAP bypass solenoid valve 2P connector terminal No. 2 and body ground.



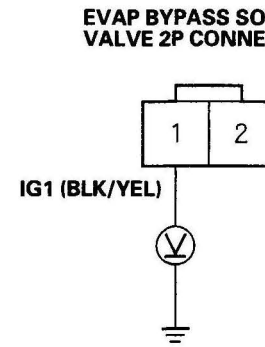
Is there continuity?

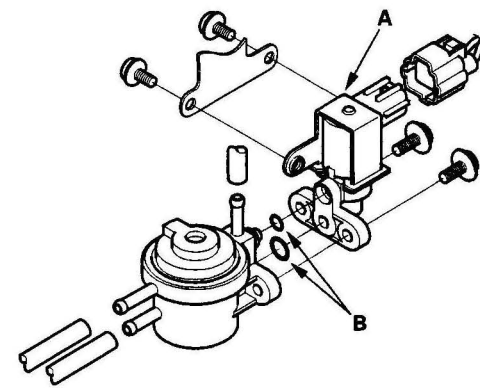
YES – Go to step 8.

NO – Repair open in wire between the EVAP bypass solenoid valve and PCM (A3). ■

18. Turn the ignition switch ON (II).

19. Measure voltage between EVAP bypass solenoid valve 2P connector terminal No. 1 and body ground.





Is there battery voltage?

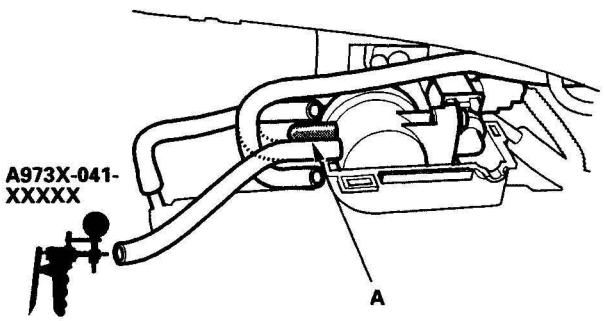
YES – Replace the EVAP bypass solenoid valve (A) and O-ring (B). ■

NO – Repair open in the wire between the EVAP bypass solenoid valve and No. 6 ECU (PCM) CRUISE CONTROL (15 A) fuse. ■

BACK

Protected by AR

20. Plug the upper port (A) of the EVAP two way valve.



21. While monitoring the Fuel Tank Pressure (FTP) sensor voltage with the Honda PGM Tester, or measure the voltage between PCM connector terminals A29 and C18, slowly pump the vacuum pump until the voltage drops to about 1.5 V.

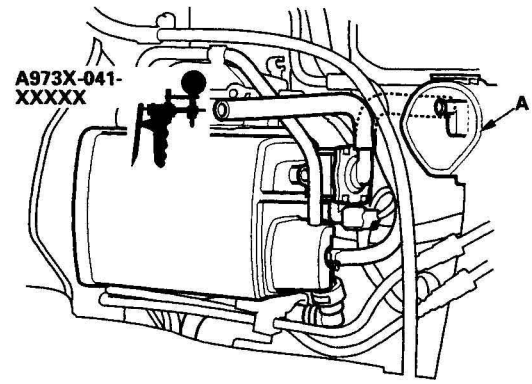
Does the voltage drop to 1.5 V and hold for at least 20 seconds?

YES – EVAP bypass solenoid valve/EVAP two way valve is OK. Go to step 20.

NO – Repair leakage from EVAP bypass solenoid valve, EVAP two way valve, FTP sensor and O-rings. ■

EVAP Canister Vent Shut Valve Test

22. Disconnect the vacuum hose from the EVAP canister filter (A), and connect a vacuum pump to the hose.



23. Turn the ignition switch ON (II).

24. Apply vacuum to the hose with 5 strokes of the pump.

Does the valve hold vacuum?

YES – Go to step 25.

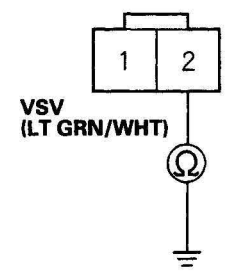
NO – EVAP canister vent shut valve is OK. Go to step 30.

25. Turn the ignition switch OFF.

26. Disconnect the EVAP canister vent valve 2P connector.

27. Check for continuity between EVAP canister vent shut valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR

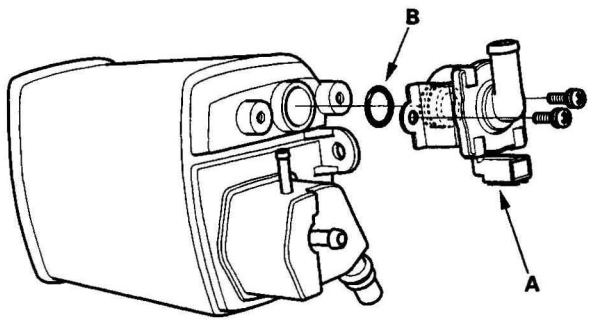


Wire side of female terminals

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)



Is there continuity?

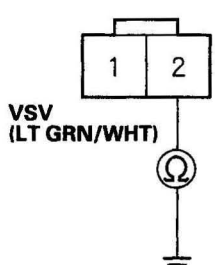
YES – Go to step 28.

NO – Replace the EVAP canister vent shut valve (A) and O-ring (B).

28. Disconnect the PCM connector A (32P).

29. Check for continuity between EVAP canister vent shut valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between the EVAP canister vent shut valve and PCM (A4). ■

NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

Vacuum Hoses and Connections Test

30. Perform fuel tank vapor control valve tests (see page 11-219).

Did the fuel tank vapor control valve test normal?

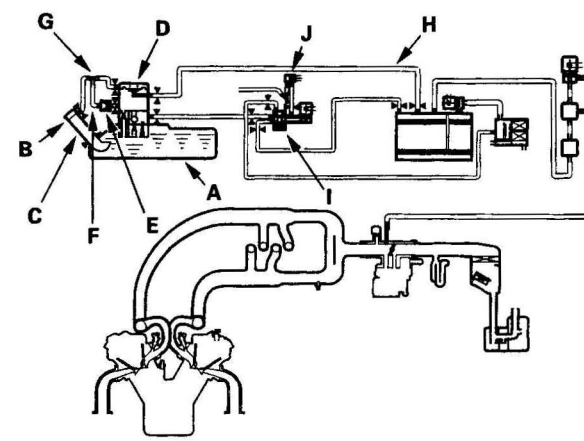
YES – Go to step 31.

NO – Replace the fuel tank vapor control valve. ■

31. Tighten the fuel cap three "clicks", then monitor the FTP readings with the Honda PGM Tester.

32. Start the engine. Let the engine idle for 5 minutes.

33. Check the FTP sensor readings.



Is the reading above 4 mm Hg pressure or below – 4mm Hg vacuum?

YES – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

NO – Check the following parts for leaks:
- Fuel tank (A)
- Fuel fill cap (B)
- Fuel fill pipe (C)
- Fuel tank vapor control valve (D)
- Fuel tank vapor recirculation valve (E)
- Fuel tank vapor recirculation tube (F)
- Fuel tank vapor signal tube (G)
- Fuel tank vapor vent tube (H)

– If necessary, repair or replace the parts. ■

BACK

Protected by AR

DTC P1457: EVAP Control System Leakage (EVAP canister system)

NOTICE

The fuel system is designed to allow specified maximum vacuum and pressure conditions. Do not deviate from the vacuum and pressure tests as indicated in these procedures. Excessive pressure/vacuum would damage the EVAP components or cause eventual fuel tank failure.

Special Tools Required

Vacuum Pump/Gauge, 0—30 in. Hg A973X-041-XXXXX

Please note that this is a 2 trip code, once cleared, they cannot be reproduced in 1 trip. Also, certain specific driving and ambient conditions must occur before the PCM will complete the system checks. Additional test drives may still not meet the specific conditions needed to reproduce the codes.

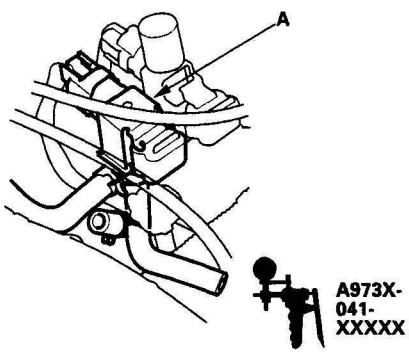
Therefore, follow these troubleshooting procedures carefully to ensure the integrity of the system and to confirm the cause of the problem or code.

NOTE: Fresh fuel has a higher volatility that will create greater pressure/vacuum. The optimum condition for testing is fresh fuel, at least half less than a full tank. If possible, to assist in leak detection, add 1 gallon of fresh fuel to the tank (as long as it will not fill the tank), just before starting these procedures.

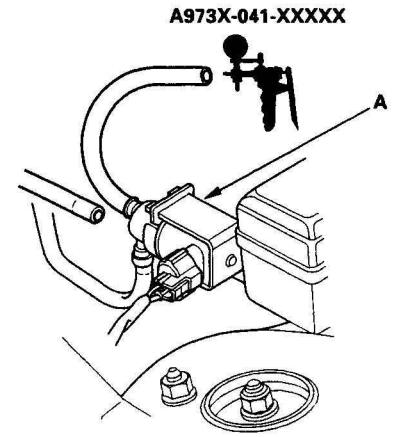
EVAP Canister Purge Valve Test

1. Disconnect the vacuum hose from the EVAP canister purge valve (A), and connect a vacuum pump to the hose.
2. Apply vacuum to the hose.

'99 model:



'00-03 models:

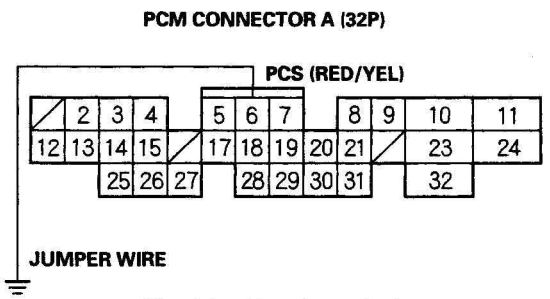


Does the valve hold vacuum?

YES—Go to step 3.

NO—Replace the EVAP canister purge valve. If the valve is contaminated with charcoal particles, replace the canister, and blow out the hoses. ■

3. Connect PCM connector terminal A6 to body ground with a jumper wire.



4. Turn the ignition switch ON (II).
5. Apply vacuum to the hose.

Does the valve hold vacuum?

YES—Go to step 6.

NO—EVAP canister purge valve is OK. Go to step 11.

6. Turn the ignition switch OFF.

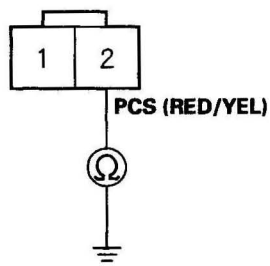
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Disconnect the EVAP canister purge valve 2P connector.
8. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

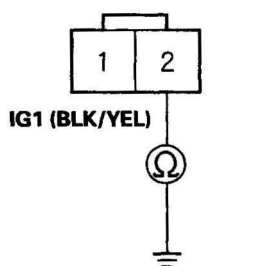
Is there continuity?

YES – Go to step 9.

NO – Repair open in the wire between the EVAP canister purge valve and PCM (A6). ■

9. Turn the ignition switch ON (II).
10. Measure voltage between EVAP canister purge valve 2P connector terminal No. 1 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

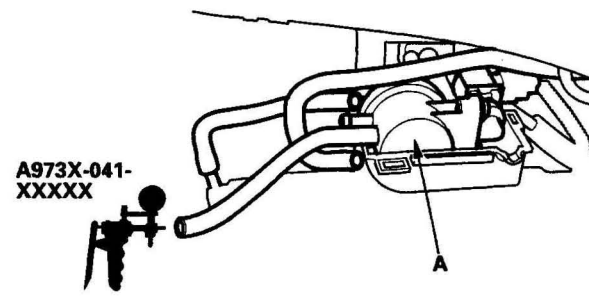
Is there battery voltage?

YES – Replace the EVAP canister purge valve. ■

NO – Repair open in the wire between the EVAP canister purge valve and No. 6 ECU (PCM) CRUISE CONTROL (15A) fuse. ■

EVAP Bypass Solenoid Valve Test

11. Disconnect the vacuum hose from EVAP two way valve (A), and connector a vacuum pump to the hose.



12. Turn the ignition switch ON (II).
13. Apply vacuum to the hose.

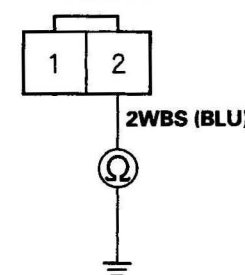
Does the valve hold vacuum?

YES – EVAP bypass solenoid valve/EVAP two way valve is OK. Go to step 19.

NO – Go to step 14.

14. Turn the ignition switch OFF.
15. Disconnect the EVAP bypass solenoid valve 2P connector.
16. Check for continuity between EVAP bypass solenoid valve 2P connector terminal No. 2 and body ground.

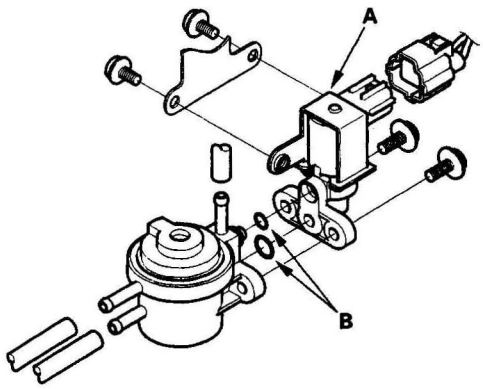
EVAP BYPASS SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

BACK

Protected by AR



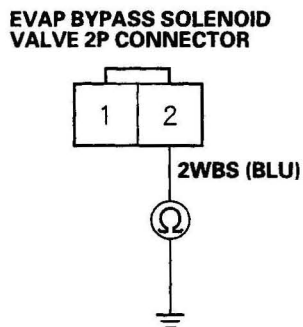
Is there continuity?

YES – Go to step 17.

NO – Replace the EVAP bypass solenoid valve (A) and O-rings (B). ■

17. Disconnect the PCM connector A (32P).

18. Check for continuity between EVAP bypass solenoid valve 2P connector terminal No. 2 and body ground.



Wire side of female terminals

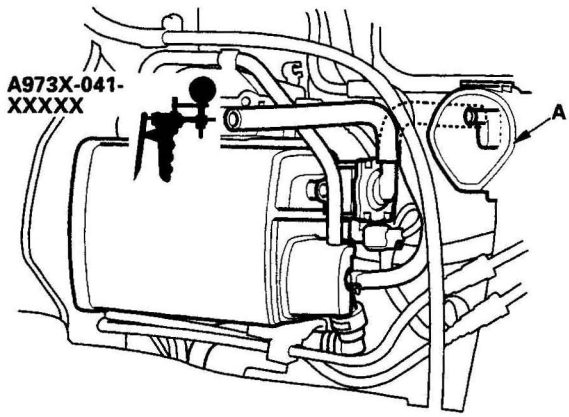
Is there continuity?

YES – Replace short in the wire between the EVAP bypass solenoid valve and PCM (A3). ■

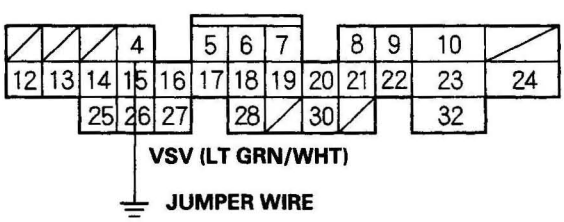
NO – Substitute a known-good PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original PCM. ■

EVAP Canister Vent Shut Valve Test

19. Disconnect the vacuum hose from the EVAP canister vent filter (A), and connect a vacuum pump to the hose.



20. Connect PCM connector terminal A4 to body ground with a jumper wire.



Wire side of female terminals

21. Turn the ignition switch ON (II)

22. Apply vacuum to the hose.

Does the valve hold vacuum?

YES – EVAP canister vent shut valve is OK. Go to step 28.

NO – Go to step 23.

23. Turn the ignition switch OFF.

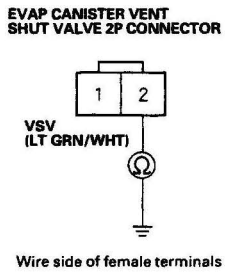
24. Disconnect the EVAP canister vent shut valve 2P connector.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

25. Check for continuity between EVAP canister vent shut valve 2P connector terminal No. 2 and body ground.



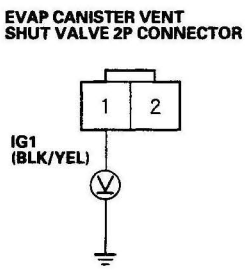
Is there continuity?

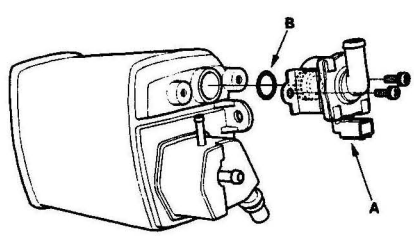
YES – Go to step 26.

NO – Repair open in the wire between the EVAP canister vent shut valve and PCM (A4). ■

26. Turn the ignition switch ON (II).

27. Measure voltage between EVAP canister vent shut valve 2P connector terminal No. 1 and body ground.





Is there battery voltage?

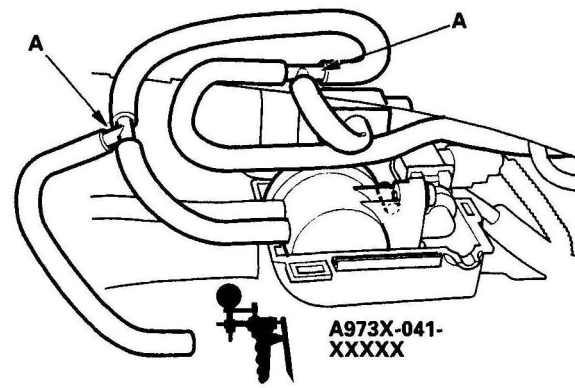
YES – Replace the EVAP canister vent shut valve (A) and O-ring (B). ■

NO – Repair open in the wire between the EVAP canister vent shut valve and No. 6 ECU (PCM) CRUISE CONTROL (15A) fuse. ■

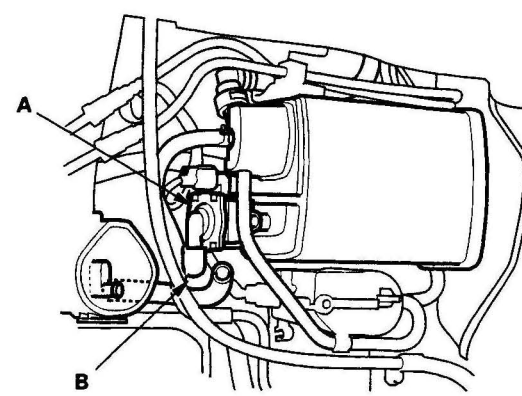
Canister System Leak Test

28. Turn the ignition switch OFF.

29. Connect two three-way T-fittings (A) into the hose from the EVAP canister to the EVAP two way valve. Connect the FTP sensor to one of the T-fittings and the vacuum pump to the other.



30. Remove the vent hose from the EVAP canister vent shut valve (A) and cap (B) the port to seal the fresh air vent for the EVAP canister.



31. Turn the ignition switch ON (II).

32. While monitoring the FTP sensor voltage with the Honda PGM Tester, or measuring voltage between PCM connector terminals A29 and C18 slowly pump the vacuum pump.

BACK

Protected by AR

33. Continue to pump vacuum until the voltage drops to about 1.5 V. Make sure that the engine coolant temperature still above 95°F (35°C) and your vacuum pump has no leak.

34. Check the voltage for 20 seconds.

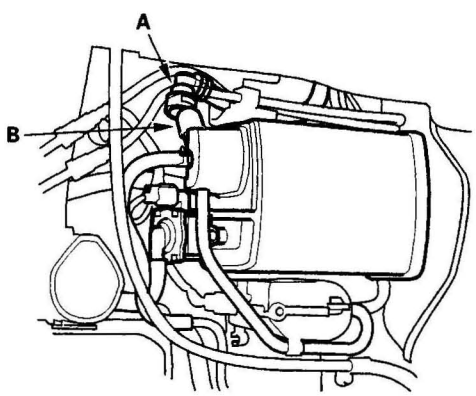
    Does the voltage drop to 1.5 V and hold for at least 20 seconds?

    YES – Inspect the EVAP canister vent shut valve line and connections. ■

    NO – Go to step 35.

35. Turn the ignition switch OFF.

36. Disconnect the quick-connect fitting (A) from the EVAP canister and plug (B) the canister port.



37. Turn the ignition switch ON (II).

38. While monitoring the FTP sensor voltage with the Honda PGM Tester, or measuring voltage between PCM connector terminals A29 and C18 slowly pump the vacuum pump.

39. Continue to pump vacuum until the voltage drops to about 1.5 V. Make sure the engine coolant temperature is still above 95°F (35°C) and your vacuum pump has no leak.

40. Check that voltage for 20 seconds.

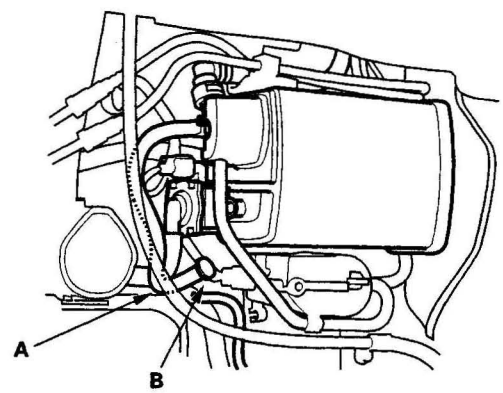
    Does the voltage drop to 1.5 V and hold for at least 20 seconds?

    YES – Inspect the fuel tank vapor vent tube and connections. ■

    NO – Go to step 41.

41. Turn the ignition switch OFF.

42. Disconnect the purge line hose (A) from the canister at the metal line and plug (B) the hose.



43. Turn the ignition switch ON (II).

44. While monitoring the FTP sensor voltage with the Honda PGM Tester, or measuring voltage between PCM connector terminals A29 and C18 slowly pump the vacuum pump.

45. Continue to pump vacuum until the voltage drops to about 1.5 V. Make sure that the engine coolant temperature still above 95°F (35°C) and your vacuum pump has no leak.

46. Monitor that check the voltage for 20 seconds.

    Does the voltage drop to 1.5 V and hold for at least 20 seconds?

    YES – Inspect EVAP canister purge valve line and connections. If they are OK, perform the EVAP two way valve test (see page 11-218), and fuel tank vapor control valve test (see page 11-219). ■

    NO – Replace the EVAP canister, and repeat step 43 through 46. If the system holds vacuum, the repair is complete. ■

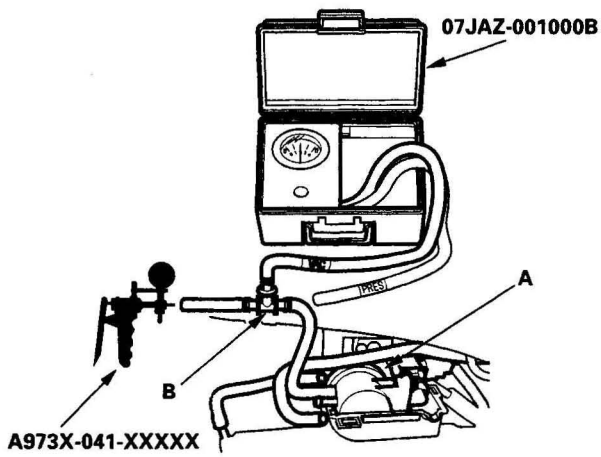
Protected by AR

EVAP Two Way Valve Test

Special Tools Required
Vacuum Pump/Gauge, 0—30 in.Hg A973X-041-XXXXX
Vacuum/Pressure Gauge, 0—4 in.Hg 07JAZ-001000B

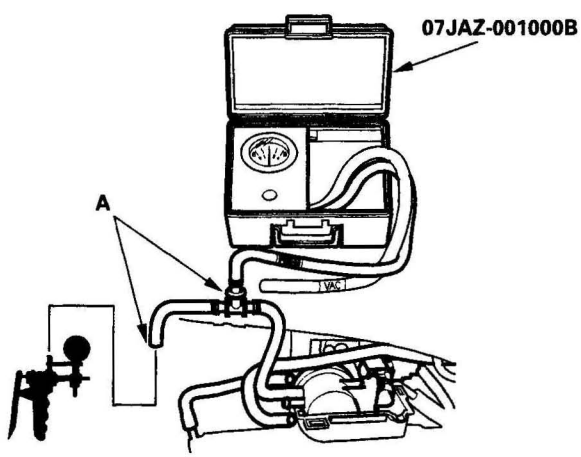
1. Remove the fuel fill cap.

2. Disconnect the vapor line from the EVAP two way valve (A) connect it to a T-fitting (B) from the vacuum gauge and the vacuum pump as shown.



3. Apply vacuum slowly and continuously while watching the gauge. The vacuum should stabilize momentarily at 0.8—2.1 kPa (6—16 mmHg, 0.2—0.6 in.Hg).
   If the vacuum stabilizes (valve opens) below 0.8 kPa (6 mmHg, 0.2 in.Hg) or above 2.1 kPa (16 mmHg, 0.6 in.Hg), install a new valve and retest.

4. Move the vacuum pump hose from the vacuum fitting to the pressure fitting, and move the vacuum gauge hose from the vacuum side to the pressure side (A) as shown.



5. Slowly pressurize the vapor line while watching the gauge. The pressure should stabilize momentarily above 1.0 kPa (8 mmHg, 0.3 in.Hg).

   - If the pressure momentarily stabilizes (valve opens) above 1.0 kPa (8 mmHg, 0.3 in.Hg), the valve is OK.
   - If the pressure stabilizes below 1.0 kPa (8 mmHg, 0.3 in.Hg), install a new valve and retest.

BACK

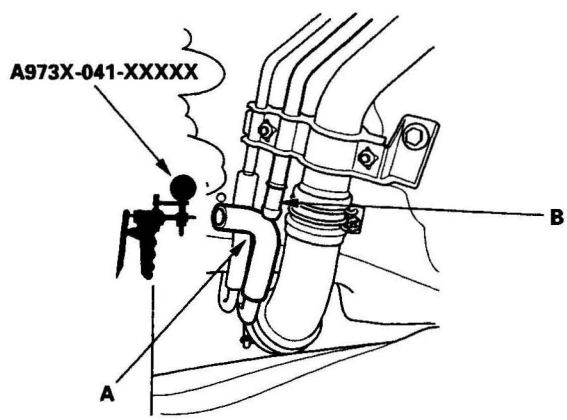
Protected by AR

Fuel Tank Vapor Control Valve Test

Special Tools Required
Vacuum Pump/Gauge, 0—30 in.Hg A973X-041-XXXXX

Float Test

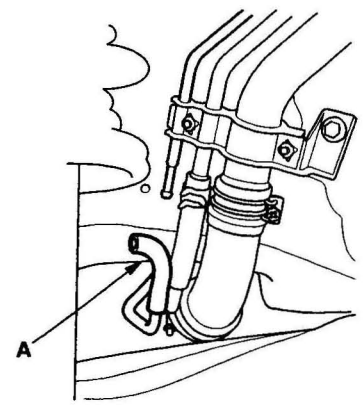
1. Make sure the fuel tank is less than half full.
2. Remove the fuel fill cap to relieve the fuel tank pressure, then reinstall the cap.
3. Remove the left rear inner fender. Disconnect the fuel tank vapor recirculation tube (A), and connect a vacuum pump to the vapor recirculation tube (A).



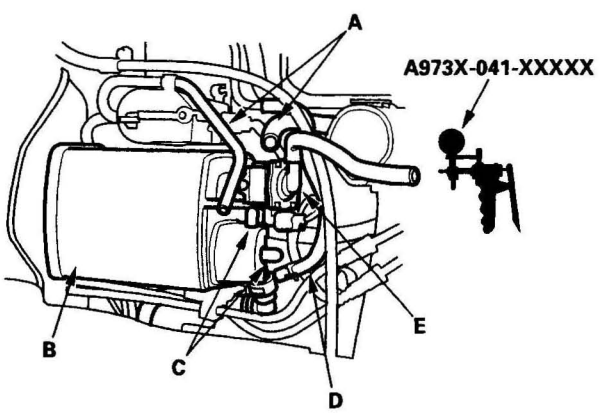
4. Plug the pipe (B).
5. Apply vacuum to the fuel tank vapor recirculation tube (A).
   - If the vacuum holds, replace the fuel tank vapor control valve (see page 11-221).
   - If the vacuum does not hold, the float is OK. Go to step 1 of the valve test.

Valve Test

1. Make sure the fuel tank is less than half full.
2. Remove the fuel fill cap.
3. Remove the left rear inner fender. Disconnect the fuel tank vapor signal tube (A).



4. Disconnect the vacuum hoses (A) from the EVAP canister (B), and then plug the ports with plugs (C).



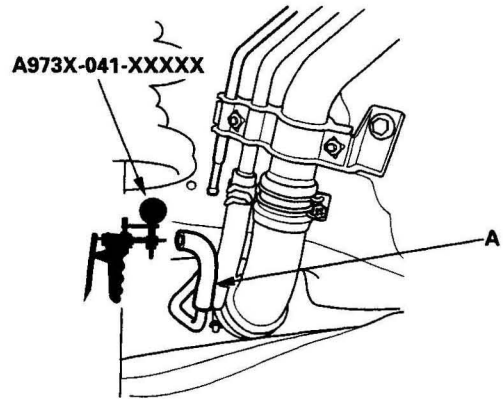
5. Disconnect the vacuum hose (D) from the EVAP canister vent shut valve (E), and connect a vacuum pump to the vacuum hose.
6. Pump the vacuum pump 80 times.
   - If the vacuum holds, go to step 7.
   - If the vacuum does not hold, go to step 9.

(cont'd)

Protected by AR

Fuel Tank Vapor Control Valve Test (cont'd)

7. Connect a second vacuum pump to the fuel tank vapor signal tube (A).



8. Apply vacuum (1 pump) to the fuel tank vapor signal tube (A), then check the vacuum on the pump in step 6.

   - If the vacuum holds, replace the fuel tank vapor control valve (see page 11-221).
   - If the vacuum is released, the fuel tank vapor control valve is OK. Go to step 10.

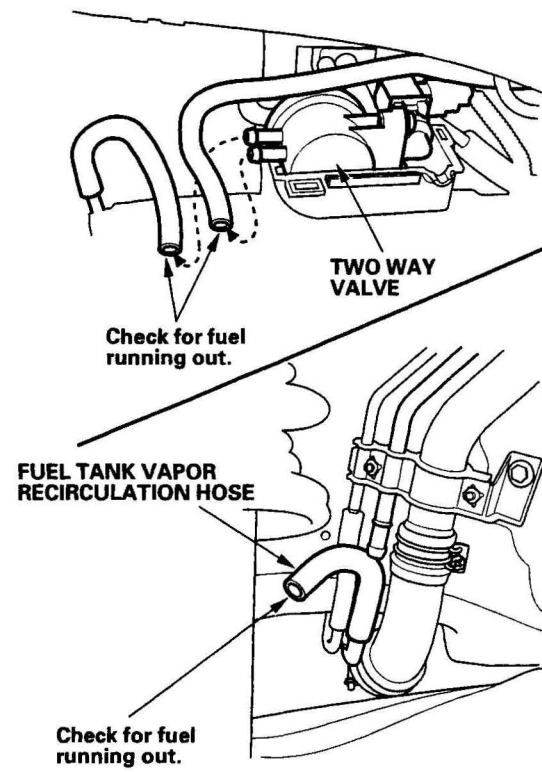
9. Disconnect the fuel tank vapor quick disconnect from the EVAP canister, then plug the port on the canister. Reapply vacuum (80 pumps).

   - If the vacuum holds, replace the fuel tank vapor control valve (see page 11-221).
   - If the vacuum does not hold, inspect the EVAP canister vent shut valve O-ring. If the O-ring is OK, replace the EVAP canister and repeat step 4.

10. Fill the gas tank with fuel, then check for fuel in the two way valve and fuel tank vapor recirculation hose.

    NOTE: At either location, tiny droplets of fuel are normal.

    - If the fuel run out of the hoses at either location, replace the fuel tank vapor control valve.
    - If the fuel does not run out of the hoses at either location, the fuel tank vapor system function is normal.

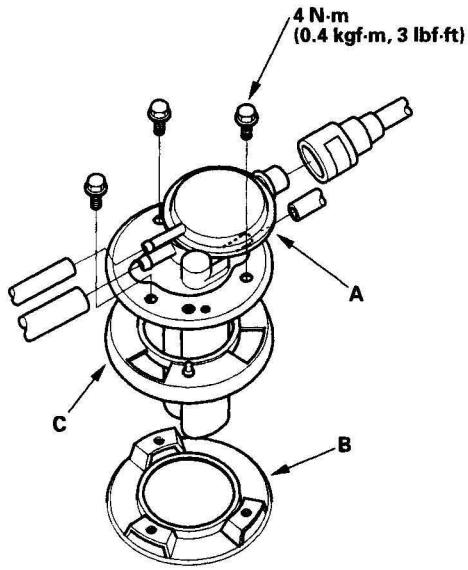


BACK

Protected by AR

Fuel Tank Vapor Control Valve Replacement

1. Remove the fuel tank (see page 11-176).
2. Remove the fuel tank vapor control valve (A) from the fuel tank (B).



3. Replace the base gasket (C).
4. Install the fuel tank vapor control valve.
5. Install the fuel tank (see step 1 on page 11-178).

Protected by AR

4-speed Automatic Transmission (1999 Model)

Automatic Transmission
Special Tools 14-2
General Troubleshooting Information 14-3
DTC Troubleshooting Index 14-7
Symptom Troubleshooting Index 14-8
System Description 14-18
DTC Troubleshooting 14-68
Road Test 14-97
Stall Speed Test 14-99
Pressure Tests 14-100
Lock-up Control Solenoid Valve-Shift Control Solenoid Valve A Assembly Test 14-102
Lock-up Control Solenoid Valve-Shift Control Solenoid Valve A Assembly Replacement 14-102
Shift Control Solenoid Valves B and C Test 14-103
Shift Control Solenoid Valves B and C Replacement 14-103
A/T Clutch Pressure Control Solenoid Valves A and B Test 14-104
A/T Clutch Pressure Control Solenoid Valves A and B Replacement 14-105
Speed Sensor Replacement 14-106
2nd Clutch Pressure Switch Replacement 14-107
3rd Clutch Pressure Switch Replacement 14-107
ATF Level Check 14-108
ATF Replacement 14-109
Transmission Removal 14-110
Transmission Installation 14-117
ATF Cooler Flushing 14-123
ATF Cooler Hoses Replacement 14-124
Shift Lever Removal 14-125
Shift Lever Installation 14-126
Shift Lever Disassembly/Reassembly 14-128
Shift Cable Replacement 14-129
Shift Cable Adjustment 14-132

A/T Gear Position Indicator
Component Location Index 14-134
Circuit Diagram 14-135
D4 Indicator Circuit Troubleshooting 14-136
Sequential Sportshift A/T Shift Switch Circuit Troubleshooting 14-139
Sportshift Indicator Circuit Troubleshooting 14-141
Indicator Input Test 14-142
A/T Gear Position Switch Test 14-144
A/T Gear Position Switch Replacement 14-145
Indicator Bulb Replacement 14-147

A/T Interlock System
Component Location Index 14-148
Circuit Diagram 14-149
Shift Lock System Circuit Troubleshooting 14-150
Key Interlock System Circuit Troubleshooting 14-153
Reverse Lock System Circuit Troubleshooting 14-155
Control Unit Input Test 14-157
Key Interlock Solenoid/Switch Test 14-159
Shift Lock Solenoid Test 14-159
Shift Lock Solenoid Replacement 14-160
Park Pin Switch Test 14-160

Transmission End Cover
End Cover and Idler Gears Removal 14-161
Park Lever Stop Inspection and Adjustment 14-163
End Cover and Idler Gears Installation 14-203

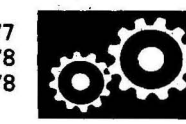
Transmission Housing
Housing and Shaft Assemblies Removal 14-164
Bearing Removal and Installation 14-166
Shaft Assemblies and Housing Installation 14-200

Valve Body
Valve Bodies and ATF Strainer Removal 14-167
Valve Body Repair 14-169
Valve Body Valve Installation 14-170
Main Valve Body Disassembly, Inspection, and Reassembly 14-171
ATF Pump Inspection 14-173
Regulator Valve Body Disassembly, Inspection, and Reassembly 14-174
Servo Body Disassembly, Inspection, and Reassembly 14-175
Accumulator Body Disassembly, Inspection, and Reassembly 14-176
Valve Bodies and ATF Strainer Installation 14-198

Torque Converter Housing
Mainshaft Bearing and Oil Seal Replacement 14-177
Countershaft Bearing Replacement 14-178
Secondary Shaft Bearing Repacement 14-178

Shafts and Clutches
Mainshaft Disassembly, Inspection, and Reassembly 14-179
3rd/4th Clutch Clearance Inspection 14-180
Mainshaft Sealing Rings Replacement 14-181
Countershaft Disassembly, Inspection, and Reassembly 14-182
Countershaft Reverse Selector Hub and 3rd Gear Removal 14-183
Countershaft Reverse Selector Hub and 3rd Gear Installation 14-184
Countershaft Bearing Hub/Bearing Replacement 14-185
Secondary Shaft Disassembly, Inspection, and Reassembly 14-186
Secondary Shaft Clearance Inspection 14-187
Secondary Shaft Idler Gear Bearing Replacement 14-189
Clutch Disassembly 14-190
Clutch Inspection 14-192
Clutch Reassembly 14-194

A/T Differential
Component Location Index 14-209
Backlash Inspection 14-209
Final Driven Gear/Carrier Replacement 14-210
Carrier Bearing Replacement 14-210
Oil Seal Replacement 14-211
Carrier Bearing Outer Race Replacement 14-212
Carrier Bearing Preload Inspection 14-213

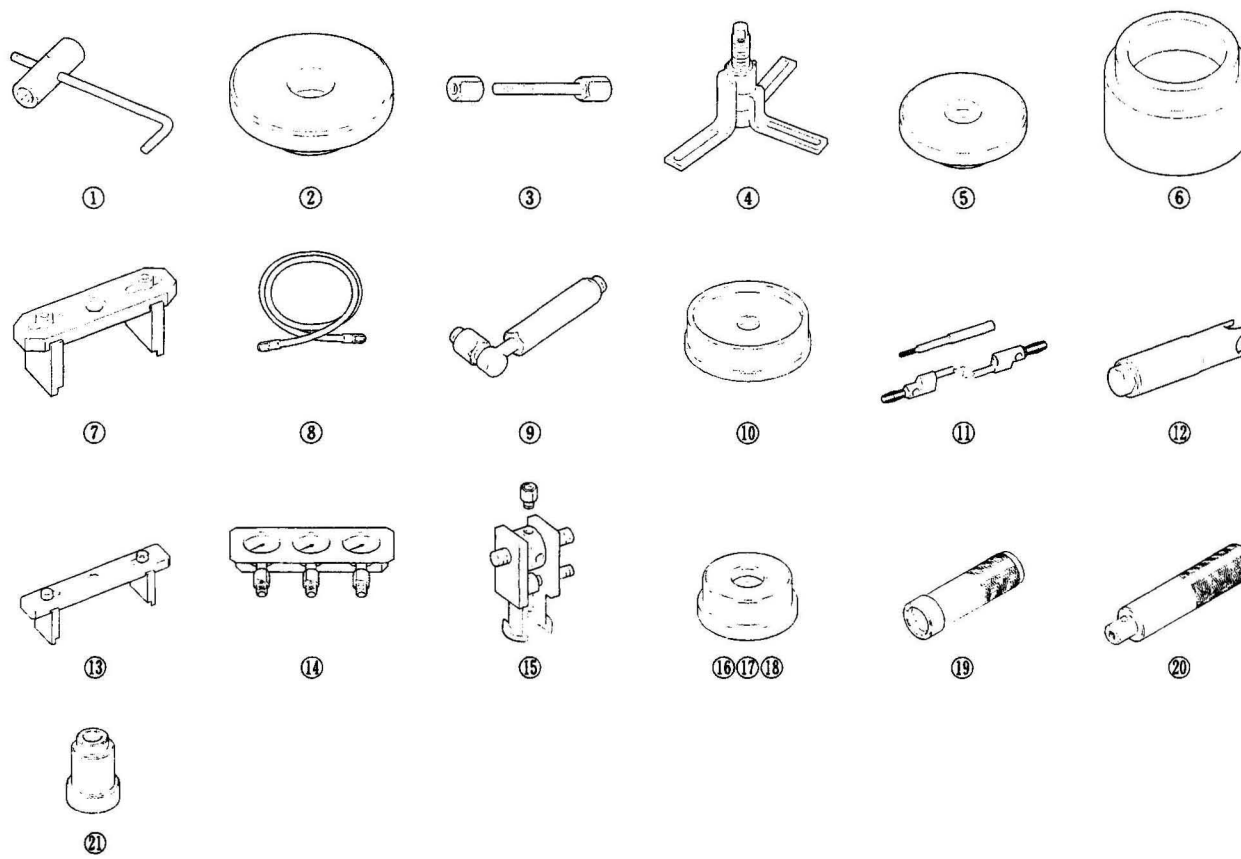


Protected by AR

Special Tools

Ref.No.	Tool Number	Description	Qty
①	07GAB-PF50101 or 07GAB-PF50100	Mainshaft Holder	1
②	07GAD-PG40101 or 07GAD-PG40100	Seal Driver Attachment	1
③	07GAE-PG40200 or 07GAE-PG4020A	Clutch Spring Compressor Bolt Assembly	1
*④	07HAC-PK40102	Housing Puller	1
⑤	07JAD-PH80101	Oil Seal Driver Attachment	1
⑥	07LAD-PW50601	Attachment, 40 x 50 mm	1
**⑦	07LAE-PX40100	Clutch Spring Compressor Attachment	2
⑧	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	4
⑨	07MAJ-PY40120	A/T Pressure Hose Adapter	4
⑩	07NAD-PX40100	Attachment, 78 x 80 mm	1
⑪	07SAZ-001000A	Backprobe Set	2
⑫	07XAJ-S0K0100	Preload Inspection Tool	1
⑬	07ZAE-PRP0100	Clutch Compressor Attachment	1
⑭	07406-0020400 or 07406-0020401	A/T Oil Pressure Gauge Set w/Panel	1
***⑮	07736-A01000B or 07736-A01000A	Adjustable Bearing Puller, 25−40 mm	1
⑯	07746-0010300	Attachment, 42 x 47 mm	1
⑰	07746-0010500	Attachment, 62 x 68 mm	1
⑱	07746-0010600	Attachment, 72 x 75 mm	1
⑲	07746-0030100	Driver 40 mm I.D.	1
⑳	07749-0010000	Driver	1
㉑	07947-6340500	Driver Attachment	1

* If the top arm is too short, replace it with 07SAC-P0Z01001.
** 07HAE-PL50101 may be used to substitute one of these tools.
*** Must be used with commercially available 3/8"-16 slide hammer.



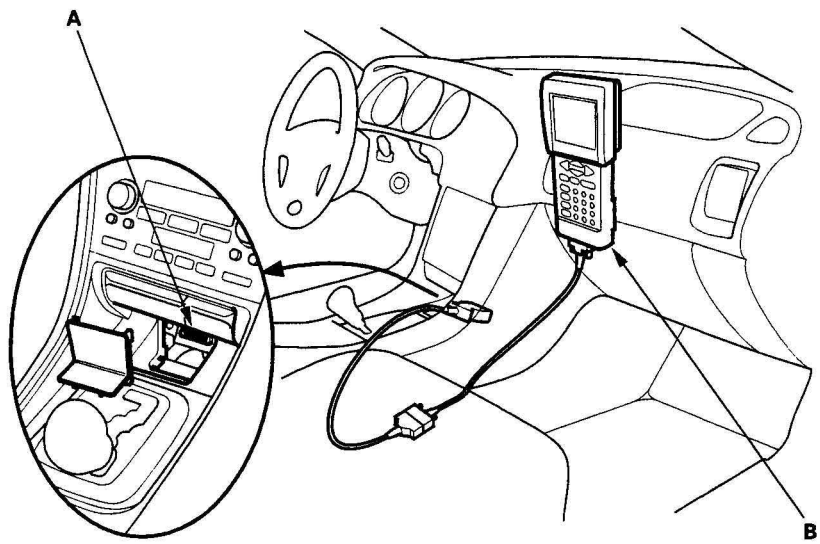
BACK

Protected by AR

General Troubleshooting Information

How to Check for DTCs with the PGM Tester/Scan Tool

When the PCM senses an abnormality in the input or output systems, the D4 indicator in the gauge assembly will usually blink and/or the Malfunction Indicator Lamp (MIL) will come on. When the 16P Data Link Connector (DLC) (A) (located behind the front console, between the seat heater switches) is connected to the OBD II Scan Tool or Honda PGM Tester (B) as shown, it will indicate the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).



If the D4 indicator or the MIL has been reported on, or if a driveability problem is suspected, follow this procedure:

1. Connect the OBD II Scan Tool (conforming to SAE J1978) or Honda PGM Tester to the 16P DLC. (See the OBD II Scan Tool or Honda PGM Tester user's manual for specific instructions. If you are using the Honda PGM Tester, make sure it is set to the SAE DTC type.)
2. Turn the ignition switch ON (II), and observe the DTC on the screen.
3. Record all fuel and emissions DTCs, A/T DTCs, and freeze data.
4. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except for DTC P0700), DTC P0700 means there is one or more A/T DTC, and no problems were detected in the fuel and emissions circuit of the PCM.
5. Get the customer's radio anti-theft code, and write down the radio station presets.
6. Reset the memory with the PGM Tester or by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.
7. Calibrate the engine idle control system in the PCM (see page 11-158), drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for DTCs. If the A/T DTC returns, go to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight, and then go to step 8.
8. Enter the radio code, reset the preset stations, and set the clock.

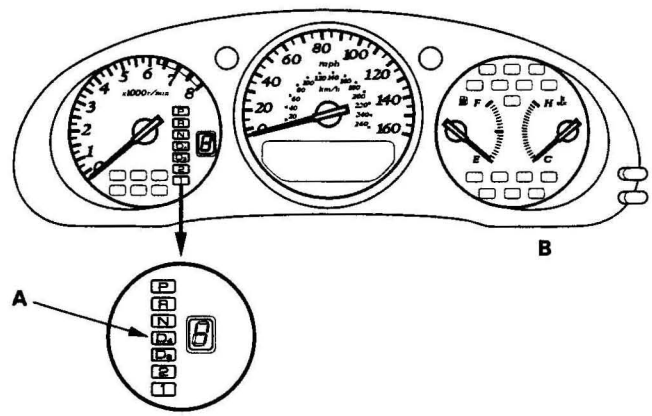
(cont'd)

Protected by AR

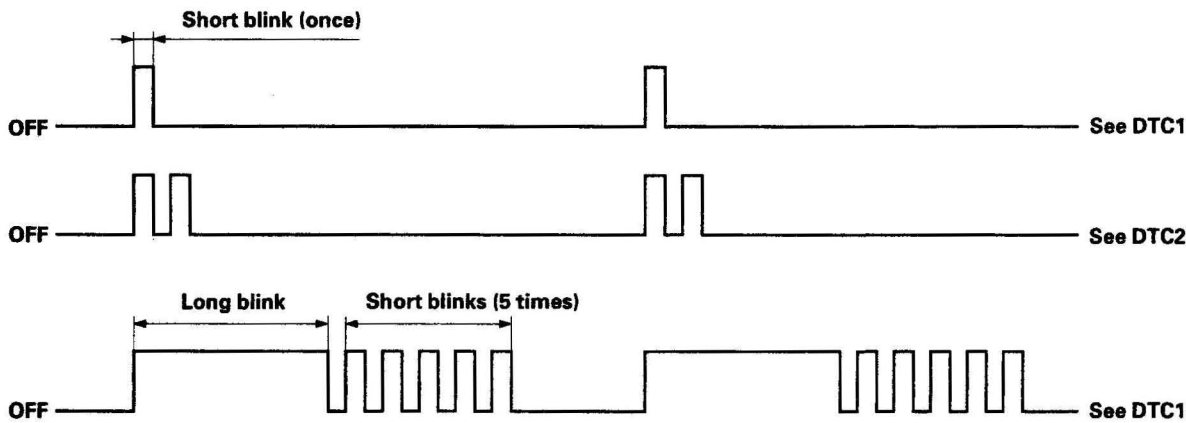
General Troubleshooting Information (cont'd)

How to Check for DTCs

When the PCM senses an abnormality in the input or output systems, the D4 indicator (A) in the gauge assembly (B) will usually blink and/or the MIL may come on. When the 16P Data Link Connector (DLC) (located behind the front console, between the seat heater switches) is connected to the Honda PGM Tester, the D4 indicator will blink the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).
When the D4 indicator has been reported on, connect the PGM Tester to the DLC (16P). Turn the ignition switch ON (II), then observe the D4 indicator.



Codes 1 through 9 are indicated by individual short blinks. Code 10 and above are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code. After determining the code, refer to the DTC Troubleshooting Index.



If the D4 indicator and the MIL come on at the same time, follow this procedure:

1. Record all fuel and emissions DTCs, A/T DTCs, and freeze data.
2. Check the fuel and emissions system indicated by the DTC.
3. Get the customer's radio anti-theft code, and write down the numbers of the radio station presets.
4. Reset the memory by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.
5. Calibrate the engine idle control system in the PCM (see page 11-158), drive the vehicle for several minutes under the same conditions as those indicated by freeze data, and then recheck for DTCs.
   If the DTC returns, refer to the DTC Troubleshooting Index. If the DTC does no return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight, then go to step 6.
6. Re-enter the radio code, reset the preset stations, and reset the clock.

BACK

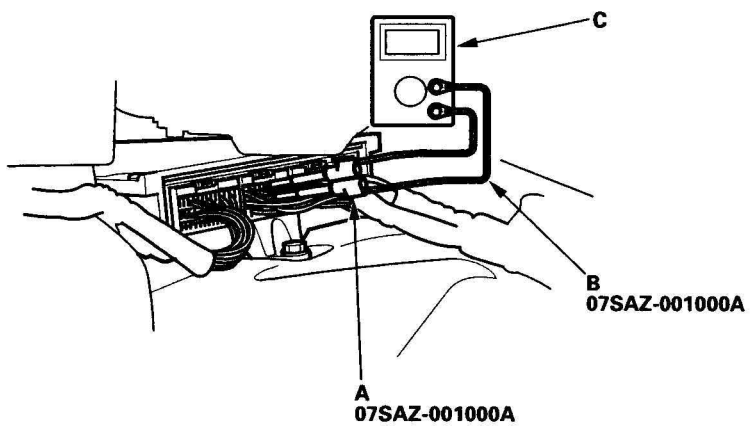
Protected by AR

How to Troubleshoot Circuits at the PCM

Special Tools Required
Backprobe set 07SAZ-001000A (Two required)

SRS components are located in this area. Review the SRS components locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-15).

1. Pull back the carpet from passenger's side of the center console to expose the PCM.
2. Inspect the circuit on the PCM, according to the DTC troubleshooting, with the special tools and a digital multimeter.
3. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a multimeter (C). Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with the terminal end of the wire.



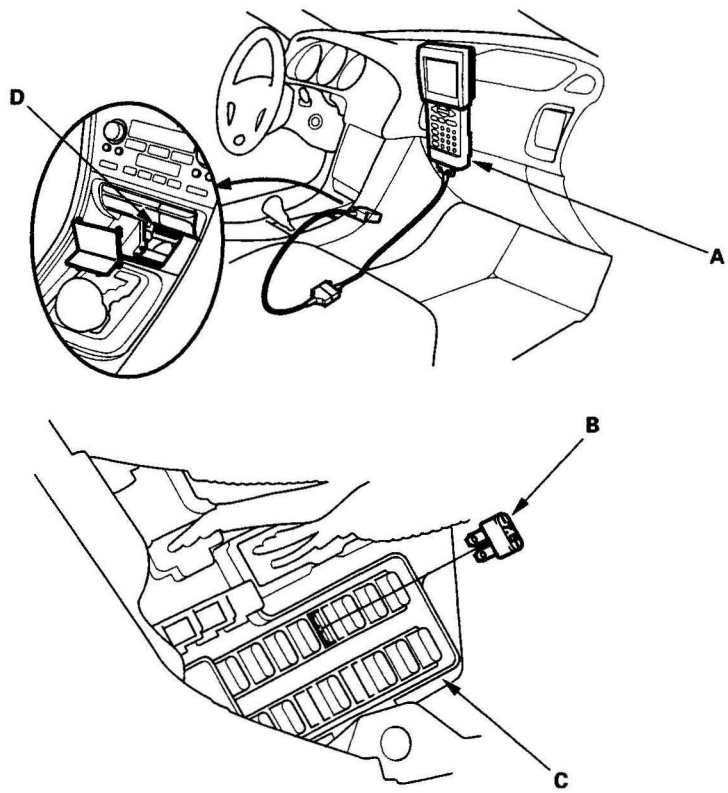
(cont'd)

Protected by AR

General Troubleshooting Information (cont'd)

How to Reset the PCM

1. Make sure you have the anti-theft code for the radio, then write down the radio station presets.
2. Turn the ignition switch OFF.
3. Use one of these methods to reset the PCM memory:
   - Use the OBD II Scan Tool or the Honda PGM Tester (A).
   - Removing the BACK-UP fuse (7.5A) (B) from the passenger's under-dash fuse/relay box (C) for 10 seconds.



How to End a Troubleshooting Session

This procedure must be done after any troubleshooting.

1. Turn the ignition switch OFF.
2. Reset the PCM.
3. Disconnect the OBD II Scan Tool or the Honda PGM Tester from the Data Link Connector (16P) (D).
4. Turn the ignition switch ON (II).
5. Enter the anti-theft code for the radio, then enter the radio station presets, and reset the clock.
6. Perform the PCM idle learn procedure (see page 11-158).
7. To verify that the problem is repaired, test-drive the vehicle for several minutes at speeds over 30 mph (48km/h).

BACK

Protected by AR

DTC Troubleshooting Index

NOTE: Record all freeze data before you troubleshoot.

DTC*	D4 Indicator	MIL	Detection Item	Page
P0715 (15)	Blinks	ON	Mainshaft speed sensor	(see page 14-68)
P0720 (9)	Blinks	ON	Countershaft speed sensor	(see page 14-70)
P0730 (41)	OFF	ON	Shift control system	(see page 14-71)
P0740 (40)	OFF	ON	Lock-up control system	(see page 14-72)
P0753 (7)	Blinks	ON	Shift control solenoid valve A	(see page 14-73)
P0758 (8)	Blinks	ON	Shift control solenoid valve B	(see page 14-75)
P0763 (22)	Blinks	ON	Shift control solenoid valve C	(see page 14-77)
P1705 (5)	Blinks	ON	A/T gear position switch (short to ground)	(see page 14-79)
P1706 (6)	OFF	ON	A/T gear position switch (open)	(see page 14-82)
P1709 (24)	Blinks	ON	A/T shift switch circuit	(see page 14-85)
P1738 (25)	OFF	OFF	2nd clutch pressure switch	(see page 14-87)
P1739 (26)	OFF	OFF	3rd clutch pressure switch	(see page 14-89)
P1753 (1)	Blinks	ON	Lock-up control solenoid valve	(see page 14-91)
P1768 (16)	Blinks	ON	A/T clutch pressure control solenoid valve A	(see page 14-93)
P1773 (23)	Blinks	ON	A/T clutch pressure control solenoid valve B	(see page 14-95)

The DTC in the parentheses is the flash code the D4 indicator indicates when the Data Link Connector (DLC) is connected to the Honda PGM Tester.

Protected by AR

Symptom Troubleshooting Index

These symptoms DO NOT trigger Diagnostic Trouble Codes (DTCs) or cause the D4 indicator to blink. If the MIL was reported ON or the D4 indicator has been blinking, check for DTCs. But if the vehicle has one of the symptoms in the following chart, check the probable causes(s) for it, in the sequence listed, until you find the problem.

Symptom	Probable cause(s)	Notes
When you turn the ignition switch ON (II), the D4 indicator comes on and stays on or never comes on at all	A problem in the D4 indicator circuit	Check the D4 indicator circuit (see page 14-136).
Shift lever cannot be moved from the P position while you're pushing on the brake pedal	A problem in the shift lock system of the interlock system	Check interlock system — shift lock system circuit (see page 14-150).
Ignition key cannot be moved from the ACC (I) position to the LOCK (0) position when you're pushing it with the shift lever in the P position	A problem in the key interlock system of the interlock system	Check interlock system — key interlock system circuit (see page 14-153).
Transmission does not shift up and down when operating the shift lever in the sequential sportshift mode position	A problem in the sequential sportshift mode switch circuit	Check the sequential sportshift A/T shift switch circuit (see page 14-139).
Shift indicator does not indicate the selected gear while the shift lever is in the sequential sportshift mode position	A problem in the shift indicator circuit	Check the sport shift indicator circuit (see page 14-141).
Shift lever cannot pass through the R position from the N position	A problem in the reverse lock system of the interlock system	Check the interlock system — reverse lock system circuit (see page 14-155).

BACK

Protected by AR

Symptom	Probable cause(s)	Notes
Engine runs, but vehicle does not move in any gear	1. Low ATF level 2. Shift cable broken or out of adjustment 3. Shift cable worn 4. ATF pump worn or binding 5. Regulator valve stuck or spring worn 6. ATF strainer clogged 7. Mainshaft worn or damaged 8. Final gears worn or damaged 9. Transmission-to-engine assembly error 10. Axle disengaged	• Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Measure line pressure. • If the strainer is clogged, find the damaged components that caused debris. • Inspect the differential pinion gears for wear. If the differential pinion gears are worn, replace the differential assembly, replace the ATF strainer, thoroughly clean the transmission, and flush the cooler and lines. Replace the torque converter. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage.
Vehicle moves in 2 and R, but not in D4, D3, or 1	1. 1st accumulator defective 2. 1st gears worn or damaged 3. 1st clutch defective	• Inspect 1st clutch pressure. • Inspect the secondary shaft and 1st/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Vehicle moves in D4, D3, 1, R, but not in 2	1. Shift control solenoid valve A defective 2. Shift valve A defective 3. 2nd accumulator defective 4. 2nd gears worn or damaged 5. 2nd clutch defective	• Check the 2 indicator, and check for loose connectors. Inspect the O-rings, and check the shift control solenoid valve for seizure. • Inspect the secondary shaft and 1st/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Vehicle moves in D4, D3, 2, 1, but not in R (or moves forward in R)	1. Shift fork shaft stuck 2. Modulator valve defective 3. Reverse CPC valve defective 4. 4th accumulator defective 5. 4th clutch defective 6. Reverse gears worn or damaged	• Measure line pressure and 4th clutch pressure. • Check for a missing shift fork bolt on the shift fork shaft. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter. • Inspect the reverse selector gear teeth chamfers, and inspect engagement teeth chamfers of the countershaft 4th gear and reverse gear. Replace the reverse gears and the reverse selector if they are worn or damaged. If the transmission makes clicking, grinding, or whirring noises, also replace the mainshaft 4th gear, reverse idler gear, and countershaft 4th gear. • If the 4th clutch feed pipe guide in the end cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If the ball bearing is OK, replace the end cover as it is dented. The O-ring under the guide is probably worn. • Replace the mainshaft if the bushing for the 3rd and 4th clutch feed pipes are loose or damaged. If the 4th clutch feed pipe is damaged or out of round, replace the end cover. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clearance with the clutch end plate.

BACK

Protected by AR

Symptom	Probable cause(s)	Notes
Poor acceleration; flares on starting off in D4 and D3: Stall speed high in D4, D3, 2, and 1	1. Low ATF level 2. Shift cable broken or out of adjustment 3. ATF pump worn or binding 4. Regulator valve stuck or spring worn 5. ATF strainer clogged 6. Torque converter check valve defective	• Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Check line pressure. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptom is mostly an rpm-ticking noise or a high pitched squeak. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You can also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools.
Poor acceleration; flares on starting off in D4 and D3: Stall speed high in D4, D3, and 1	1. Shift cable broken or out of adjustment 2. 1st clutch defective	• Check for a loose shift cable at the shift lever and the transmission control shaft. • Check 1st clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Poor acceleration; flares on starting off in 2: Stall speed high in 2	1. Shift cable broken or out of adjustment 2. 2nd clutch defective	• Check for a loose shift cable at the shift lever and the transmission control shaft. • Check 2nd clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Poor acceleration; flares on starting off in R: Stall speed is in specification in D4, D3, 2, and 1, but high in R	4th clutch defective	• Check 4th clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

(cont'd)

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Poor acceleration; Stall speed low	1. Lock-up control solenoid valve defective 2. Torque converter one-way clutch defective 3. Engine output low 4. Lock-up clutch piston defective 5. Lock-up shift valve defective 6. Restricted cooler	• Check ATF cooling system for restriction. • Check for a stuck lock-up valve in the valve body.
Engine idle vibration	1. Low ATF level 2. Lock-up control solenoid valve defective 3. Drive plate defective or transmission misassembled 4. Engine output low 5. Lock-up clutch piston defective 6. ATF pump worn or binding 7. Lock-up shift valve defective 8. Restricted cooler	• Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine and transmission mounts as outlined in the engine section of this service manual. • Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Check ATF cooling system for restriction.
Vehicle moves in [N]	1. Excessive ATF 2. Foreign material in separator plate orifice 3. 1st clutch defective 4. 2nd clutch defective 5. 3rd clutch defective 6. 4th clutch defective 7. Clutch clearance incorrect 8. Needle bearing seized up, worn, or damaged 9. Thrust washer seized up, worn, or damaged	• Check the ATF level, and drain the ATF if necessary. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance. • Check for clutch pressure in neutral.

BACK

Protected by AR

Symptom	Probable cause(s)	Notes
Late shift from the N position to D4 and D3 positions	1. Shift control solenoid valve C defective 2. A/T clutch pressure control solenoid valves A/B defective 3. Shift cable broken or out of adjustment 4. Joint in shift cable and transmission or body worn 5. Shift fork shaft stuck 6. CPC valve A stuck 7. Foreign material in separator plate orifice 8. Shift valve C defective 9. Servo control valve defective 10. 1st accumulator defective 11. 1st check ball stuck 12. 1st clutch defective	• Check the D4 indicator, and check for loose connectors. Inspect the O-ring, and check the shift control solenoid valve for seizure. • Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Check for a loose shift cable at the shift lever and the transmission control shaft. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter. • Check 1st clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Late shift from the N position to the R position	1. Shift control solenoid valve C defective 2. A/T clutch pressure control solenoid valves A/B defective 3. Shift cable broken or out of adjustment 4. Joint in shift cable and transmission or body worn 5. Shift fork shaft stuck 6. Foreign material in separator plate orifice 7. Reverse CPC valve defective 8. 4th accumulator defective 9. 4th clutch defective	• Check the D4 indicator, and check for loose connectors. Inspect the O-ring, and check the shift control solenoid valve for seizure. • Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Check for a loose shift cable at the shift lever and the transmission control shaft. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter. • Check 4th clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
No shift	Modulator valve defective.	Measure line pressure.
Erratic shifting gears: Fails to shift in the D4 position; does not upshift to 4th	1. Shift control solenoid valve A defective 2. Mainshaft speed sensor defective 3. Countershaft speed sensor defective 4. Shift valve A defective 5. Shift valve D defective	• Inspect the O-ring, and check the shift control solenoid valve for seizure. • Check the D4 indicator, and check for loose connectors. Inspect the A/T gear position switch. If the A/T gear position switch is faulty, replace it. If the A/T gear position switch is out of adjustment, adjust it and the shift cable.
Erratic shifting gears: Fails to shift in the D4 and D3 positions; does not upshift to 3rd and 4 th	1. Shift control solenoid valve B defective 2. Shift fork shaft stuck 3. Shift valve B defective 4. Servo control valve defective	• Check the D4 indicator, and check for loose connectors. Inspect the O-ring, and check the shift control solenoid valve for seizure. • Check for a missing shift fork bolt on the shift fork shaft.
Erratic shifting gears: Fails to shift in the D4, D3 and 1 positions; starts off in 3rd	1. Shift control solenoid valve B defective 2. Shift valve B defective 3. Shift valve E defective	Check the D4 indicator, and check for loose connectors. Inspect the O-ring, and check the shift control solenoid valve for seizure.
Excessive shock, or flares on all upshifts and downshifts	1. A/T clutch pressure control solenoid valves A/B defective 2. CPC valve A defective 3. CPC valve B defective 4. Foreign material in separator plate orifice	Check the D4 indicator, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves.
Excessive shock or flares on 1-2 upshift or 2-1 downshift	1. Shift control solenoid valve C defective 2. 2nd clutch pressure switch or circuit defective 3. Foreign material in separator plate orifice 4. Shift valve C defective 5. 1st accumulator defective 6. 2nd accumulator defective 7. 1st check ball stuck 8. 2nd check ball stuck 9. 1st clutch defective 10. 2nd clutch defective	• Check the D4 indicator, and check for loose connectors. Inspect the O-rings, and check the shift control solenoid valve for seizure. • Check the D4 indicator, and check for loose connectors. Check that the outlet is not clogged inside of the 2nd clutch pressure switch connector. • Check 1st and 2nd clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

BACK

Protected by AR

Symptom	Probable cause(s)	Notes
Excessive shock, or flares on 2-3 upshift or 3-2 downshift	1. Shift control solenoid valve C defective 2. 3rd clutch pressure switch or circuit defective 3. Foreign material in separator plate orifice 4. Shift valve C defective 5. 2nd accumulator defective 6. 3rd accumulator defective 7. 2nd check ball stuck 8. 2nd clutch defective 9. 3rd clutch defective	• Check the D4 indicator, and check for loose connectors. Inspect the O-rings, and check the shift control solenoid valve for seizure. • Check 2nd and 3rd clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Excessive shock, or flares on 3-4 upshift or 4-3 downshift	1. Shift control solenoid valve C defective 2. Foreign material in separator plate orifice 3. Shift valve C defective 4. 3rd accumulator defective 5. 4th accumulator defective 6. 3rd clutch defective 7. 4th clutch defective	• Check the D4 indicator, and check for loose connectors. Inspect the O-rings, and check the shift control solenoid valve for seizure. • Check 3rd and 4th clutch pressures. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter, and check the stall speed. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Noise from transmission in all shift lever positions	1. ATF pump worn or binding 2. Torque converter housing or transmission housing bearing worn or damaged	• Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Inspect the contact of the countershaft and secondary shaft with the bearings. Check the ATF guide plates for damage and wear. Inspect the 1st clutch feed pipe for damage and out of round. If the 1st clutch feed pipe is damaged or out of round, replace it. Replace the secondary shaft if the bushing for the 1st clutch feed pipe is damaged or out of round.
Vehicle does not accelerate more than 31 mph (50 km/h)	Torque converter one-way clutch defective	Replace torque converter.

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Vibration in all shift lever positions	Drive plate defective or transmission misassembled	• Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine mounts as described in the engine section of this service manual. • Check the stall speed.
Shift lever does not operate smoothly	1. A/T gear position switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable and transmission or body worn	• Check the D4 indicator, and check for loose connectors. Inspect the A/T gear position switch. If the A/T gear position switch is faulty, replace it. If the A/T gear position switch is out of adjustment, adjust it and the shift cable. • Check for a loose shift cable at the shift lever and the transmission control shaft.
Transmission does not shift into the P position	1. Shift cable broken or out of adjustment 2. Joint in shift cable and transmission or body worn 3. Park mechanism defective	• Check for a loose shift cable at the shift lever and the transmission control shaft. • Check the park pawl spring installation and the park lever spring installation. If installation is incorrect, install the spring correctly. Make sure that the park lever stop is not installed upside down. Check the distance between the park pawl shaft and the park lever roller pin. If the distance is out of tolerance, adjust the distance with the park lever stop.
Lock-up clutch does not disengage	1. Lock-up control solenoid valve defective 2. A/T clutch pressure control solenoid valves A/B defective 3. Lock-up clutch piston defective 4. Lock-up shift valve defective 5. Lock-up control valve defective 6. Lock-up timing valve defective 7. Restricted cooler	• Check the D4 indicator, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Check ATF cooling system for restriction.

BACK

Protected by AR

Symptom	Probable cause(s)	Notes
Lock-up clutch does not operate smoothly	1. Lock-up control solenoid valve defective 2. A/T clutch pressure control solenoid valves A/B defective 3. Lock-up clutch piston defective 4. Torque converter check valve defective 5. Lock-up shift valve defective 6. Lock-up control valve defective 7. Lock-up timing valve defective 8. Non-Honda ATF used	• Check the D4 indicator, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Center all engine mounts.
Lock-up clutch does not engage	1. Lock-up control solenoid valve defective 2. A/T clutch pressure control solenoid valves A/B defective 3. Mainshaft speed sensor defective 4. Countershaft speed sensor defective 5. Lock-up clutch piston defective 6. Torque converter check valve defective 7. Lock-up shift valve defective 8. Lock-up control valve defective	Check the D4 indicator, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves.
A/T gear position indicator does not indicate shift lever positions	1. A/T gear position switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable and transmission or body worn	• Check the D4 indicator, and check for loose connectors. Inspect the A/T gear position switch. If the A/T gear position switch is faulty, replace it. If the A/T gear position switch is out of adjustment, adjust it and the shift cable. • Check for a loose shift cable at the shift lever and the transmission control shaft.
Speedometer and odometer do not operate	Countershaft speed sensor defective	Check the D4 indicator, and check for loose connectors.

Protected by AR

System Description

General Operation

The automatic transmission is a combination of a 3-element torque converter and triple-shaft electronically controlled unit which provides 4 speeds forward and 1 reverse. The entire unit is positioned in line with the engine.

Torque Converter, Gears, and Clutches

The torque converter consists of a pump, turbine, and stator assembly in a single unit. They are connected to the engine crankshaft so they turn together as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel, transmitting power to the transmission mainshaft. The transmission has three parallel shafts: the mainshaft, the countershaft, and the secondary shaft. The mainshaft is in line with the engine crankshaft. The mainshaft includes the 3rd and 4th clutches, and gears for 3rd, 4th, reverse, and idler (reverse gear is integral with the 4th gear). The countershaft includes the final drive, 1st, 3rd, 4th, reverse, 2nd, park, and idler gears (the final drive gear is integral with the countershaft). The secondary shaft includes the 1st and 2nd clutches, and gears for 1st, 2nd, and idler. The countershaft 4th gear and the countershaft reverse gear can be locked to the countershaft at its center, providing 4th gear or reverse, depending with which way the selector moved. The gears on the mainshaft and the secondary shaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted from the mainshaft and the secondary shaft to the countershaft to provide D4, D3, 2, 1, and R positions.

Electronic Control

The electronic control system consists of the Powertrain Control Module (PCM), sensors, and six solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel behind the center console.

Hydraulic Control

The valve bodies include the main valve body, the regulator valve body, the servo body, and the accumulator body. They are bolted to the torque converter housing. The main valve body contains the manual valve, the modulator valve, the shift valve C, the shift valve D, the shift valve E, the servo control valve, the torque converter check valve, the reverse CPC valve, the lock-up shift valve, the relief valve, the cooler check valve, and the ATF pump gears. The regulator valve body contains the regulator valve, the lock-up timing valve, and the lock-up control valve. The servo body contains the servo valve, the shift valve A, the shift valve B, the CPC valves A and B, and 3rd and 4th accumulators. The accumulator body contains the 1st and 2nd accumulators and lubrication check valve. Fluid from the regulator passes through the manual valve to the various control valves. The 1st, 3rd, and 4th clutches receive fluid from their respective feed pipes, and the 2nd clutch receives fluid from the internal hydraulic circuit.

Shift Control Mechanism

The PCM controls shift control solenoid valves A, B, and C, and A/T clutch pressure control solenoid valves A and B while receiving input signals from various sensors and switches located throughout the vehicle. The shift control solenoid valves shift the positions of the shift valves to switch the port leading hydraulic pressure to the clutch. The A/T clutch pressure control solenoid valves A and B control the CPC valves A and B to shift smoothly between lower gear and higher gear. This pressurizes a line to one of the clutches, engaging the clutch and its corresponding gear.

Lock-up Mechanism

In D4 position (3rd and 4th) and D3 position (3rd), pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, the PCM optimizes the timing of the lock-up mechanism. When the lock-up control solenoid valve activates, modulator pressure changes to switch lock-up on and off. The lock-up control valve and the lock-up timing valve control the range of lock-up according to A/T clutch pressure control solenoid valves A and B. The lock-up control solenoid valve is mounted on the torque converter housing, and A/T clutch pressure control solenoid valves A and B are mounted on the transmission housing. They are all controlled by the PCM.

BACK

Protected by AR

Gear Selection
The shift lever has eight positions: [P] PARK, [R] REVERSE, [N] NEUTRAL, [D4] 1st through 4th gear ranges, [D3] 1st through 3rd gear ranges, [2] 2nd gear, [1] 1st gear, and the sequential sportshift mode position.

Position	Description
[P] PARK	Front wheels locked; park pawl engaged with park gear on countershaft. All clutches are released.
[R] REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th clutch locked.
[N] NEUTRAL	All clutches are released.
[D4] DRIVE (1st through 4th)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshift through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism operates in 3rd and 4th gears.
[D3] DRIVE (1st through 3rd)	Used for rapid acceleration at highway speeds and general driving; up-hill and down-hill driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to stop. The lock-up mechanism operates in 3rd gear.
[2] SECOND	Used for engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear, does not shift up or down.
[1] FIRST	Used for engine braking; stays in 1st gear, does not shift up.

Starting is possible only in the [P] and [N] positions because of a slide-type neutral-safety switch.

Automatic Transaxle (A/T) Gear Position Indicator
The A/T gear position indicator in the instrument panel shows which gear has been selected without having to look down at the console. With the shift lever in the sequential sportshift mode position, the indicator next to the [D4] indicator in the instrument panel will display the gear selected.

(cont'd)

BACK

Protected by AR

System Description (cont'd)

Clutches

The 4-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. When hydraulic pressure is introduced into the clutch drum, the clutch piston moves. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear. Likewise, when the hydraulic pressure is bled from the clutch pack, the piston releases the friction discs and the steel plates, and they are free to slide past each other. This allows the gear to spin independently on its shaft, transmitting no power.

1st Clutch
The 1st clutch engages/disengages 1st gear, and is located at the middle of the secondary shaft. The 1st clutch is joined back-to-back to the 2nd clutch. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft.

2nd Clutch
The 2nd clutch engages/disengages 2nd gear, and is located at the middle of the secondary shaft. The 2nd clutch is joined back-to-back to the 1st clutch. The 2nd clutch is supplied hydraulic pressure through the secondary shaft by a circuit connected to the internal hydraulic circuit.

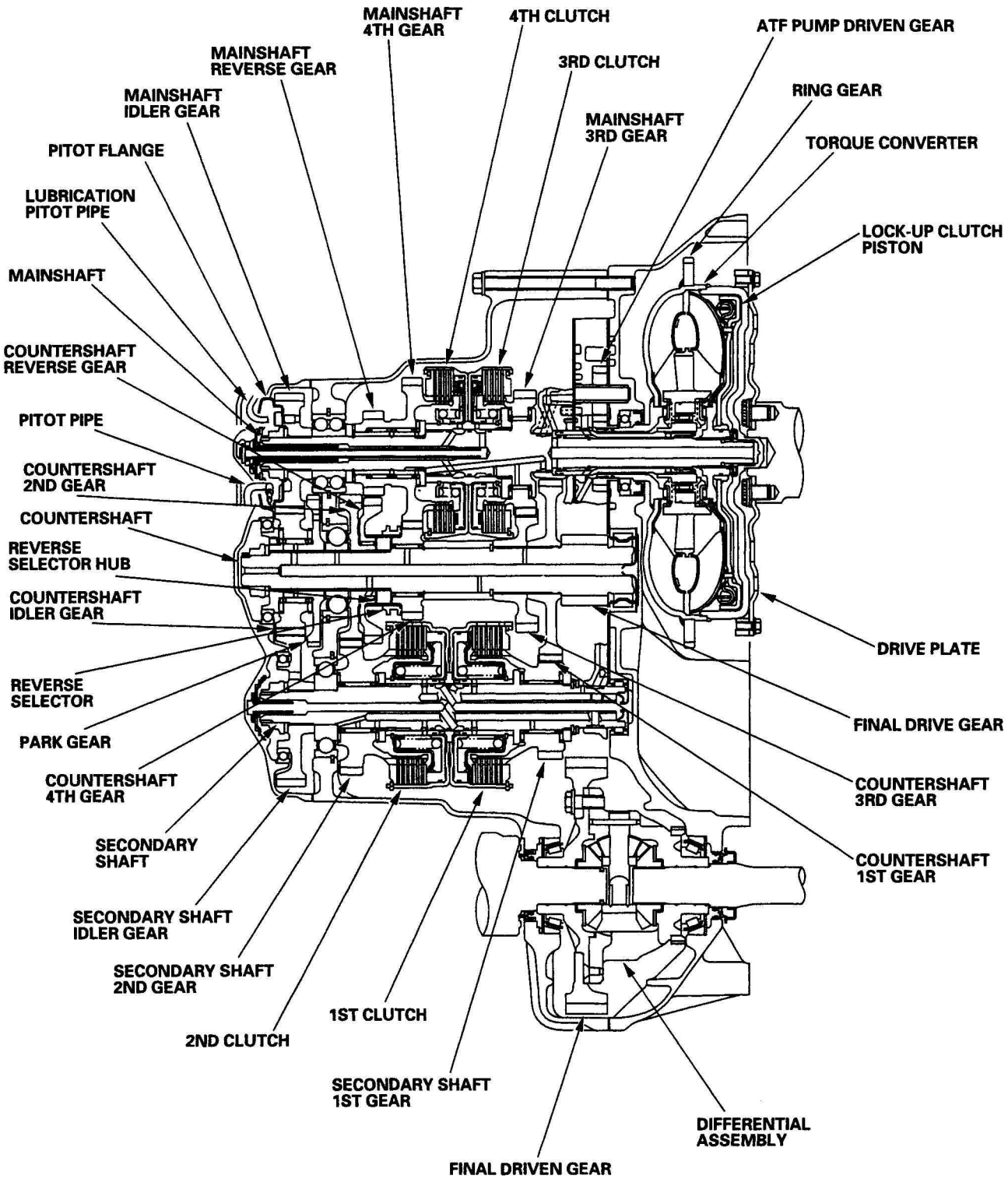
3rd Clutch
The 3rd clutch engages/disengages 3rd gear, and is located at the middle of the mainshaft. The 3rd clutch is joined back-to-back to the 4th clutch. The 3rd clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

4th Clutch
The 4th clutch engages/disengages 4th gear, as well as reverse gear, and is located at the middle of the mainshaft. The 4th clutch is joined back-to-back to the 3rd clutch. The 4th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

BACK

Protected by AR

Transmission Sectional View



(cont'd)

BACK

Protected by AR

System Description (cont'd)

Power Flow

POSITION		PART							
		TORQUE CONVERTER	1ST GEAR 1ST CLUTCH	2ND GEAR 2ND CLUTCH	3RD GEAR 3RD CLUTCH	4TH GEAR	4TH CLUTCH	REVERSE GEAR	PARK GEAR
P		○	×	×	×	×	×	×	○
R		○	×	×	×	×	○	○	×
N		○	×	×	×	×	×	×	×
D4	1ST	○	○	×	×	×	×	×	×
	2ND	○	×	○	×	×	×	×	×
	3RD	○	×	×	○	×	×	×	×
	4TH	○	×	×	×	○	○	×	×
D3	1ST	○	○	×	×	×	×	×	×
	2ND	○	×	○	×	×	×	×	×
	3RD	○	×	×	○	×	×	×	×
2		○	×	○	×	×	×	×	×
1		○	○	×	×	×	×	×	×

○:Operates
×:Doesn't operate

Gear Operation

Gears on the mainshaft:

- 3rd gear is engaged/disengaged with the mainshaft by the 3rd clutch.
- 4th gear is engaged/disengaged with the mainshaft by the 4th clutch.
- Reverse gear is engaged/disengaged with the mainshaft by the 4th clutch.
- The idler gear is splined with the mainshaft and rotates with the mainshaft.

Gears on the countershaft

- The final drive gear is integral with the countershaft.
- 1st gear, 3rd gear, 2nd gear and park gear are splined with the countershaft, and rotate with the countershaft.
- 4th gear and reverse gear rotate freely from the countershaft. The reverse selector engages the 4th gear or the reverse gear with the reverse selector hub. The reverse selector hub is splined with the countershaft so that the 4th gear or reverse gear engage with the countershaft.
- The idler gear rotates freely from the countershaft.

Gears on the secondary shaft

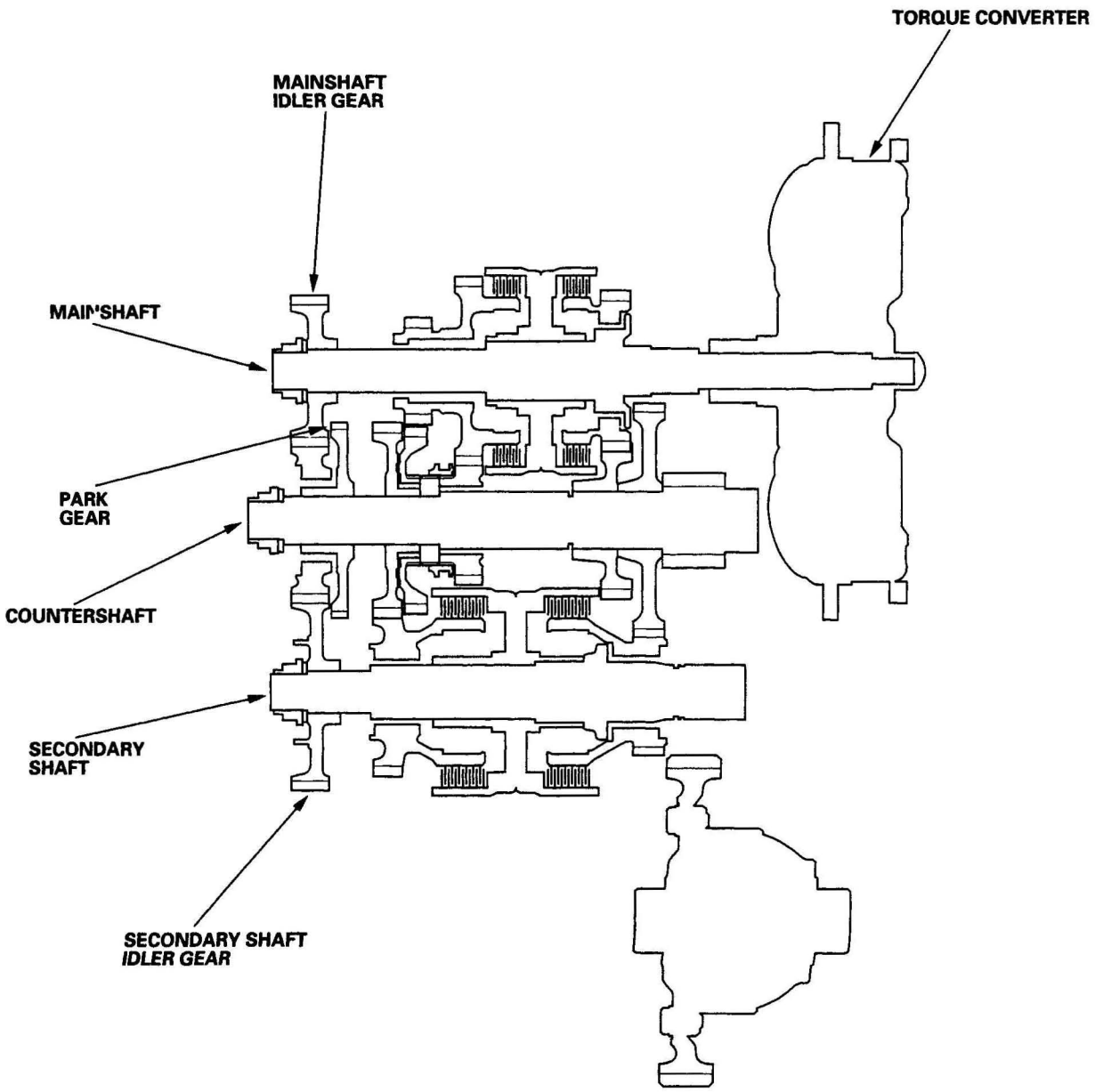
- 1st gear is engaged/disengaged with the secondary shaft by the 1st clutch.
- 2nd gear is engaged/disengaged with the secondary shaft by the 2nd clutch.
- The idler gear is splined with the secondary shaft and rotates with the secondary shaft.

BACK

Protected by AR

[P] Position
Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft is locked by the park pawl interlocking the park gear.

[N] Position
Engine power transmitted from the torque converter drives the mainshaft idler gear, the countershaft idler gear, and the secondary shaft idler gear, but hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft 4th gear is engaged with the reverse selector hub and the countershaft by the reverse selector, when the shift lever is shifted in the [N] position from the [D4] position. The countershaft reverse gear is engaged when shifted from the [R] position.



(cont'd)

BACK

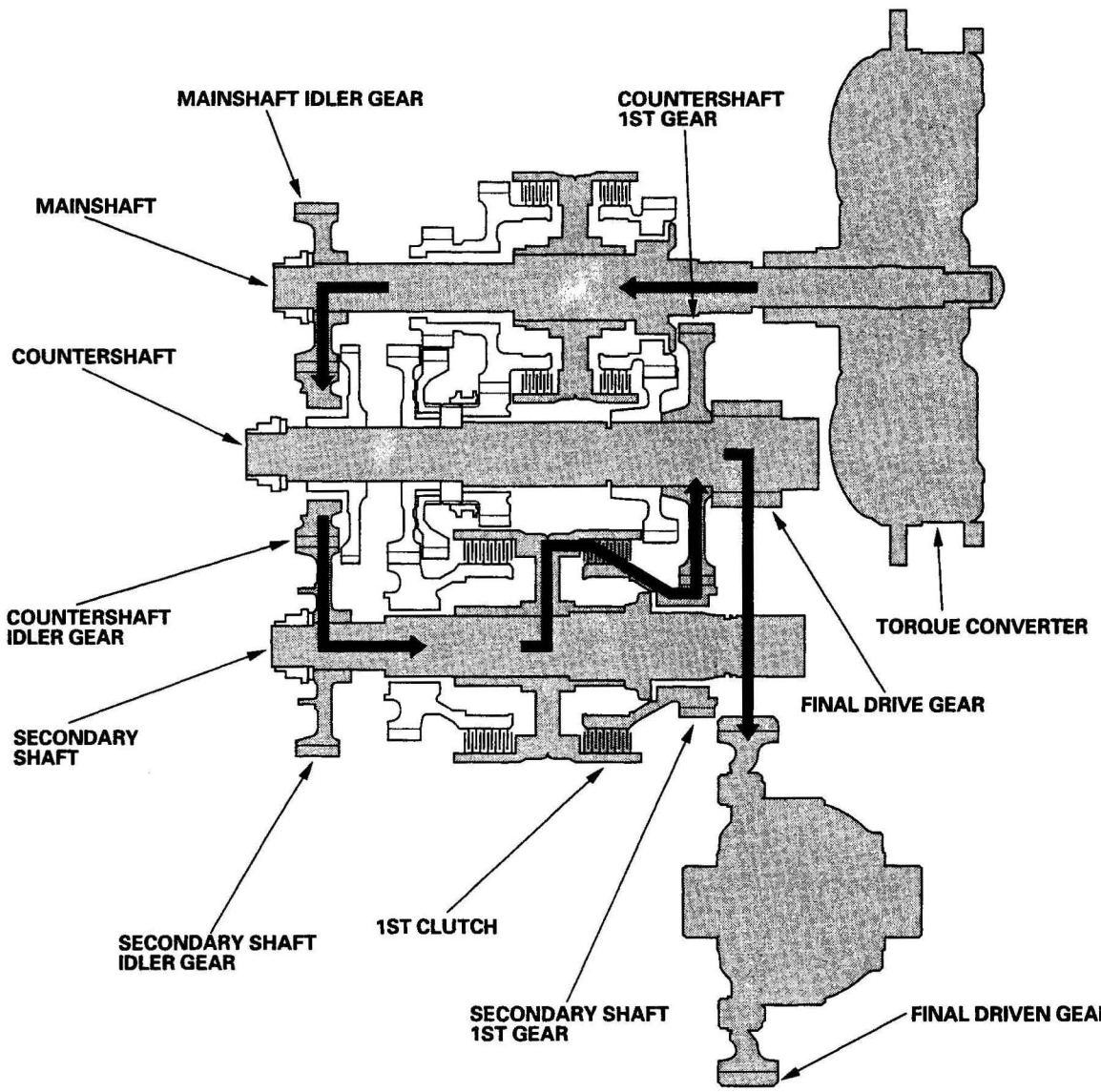
Protected by AR

System Description (cont'd)

Power Flow (cont'd)

D4 or D3 Position
In D4 or D3 position, the optimum gear is automatically selected from the 1st, 2nd, 3rd and 4th gears, according to conditions such as the balance between the throttle opening (engine loading) and vehicle speed.

D4 or D3 Position in 1st gear and 1 Position
- Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft.
- The mainshaft idler gear drives the secondary shaft via the countershaft idler gear and secondary shaft idler gear.
- The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.

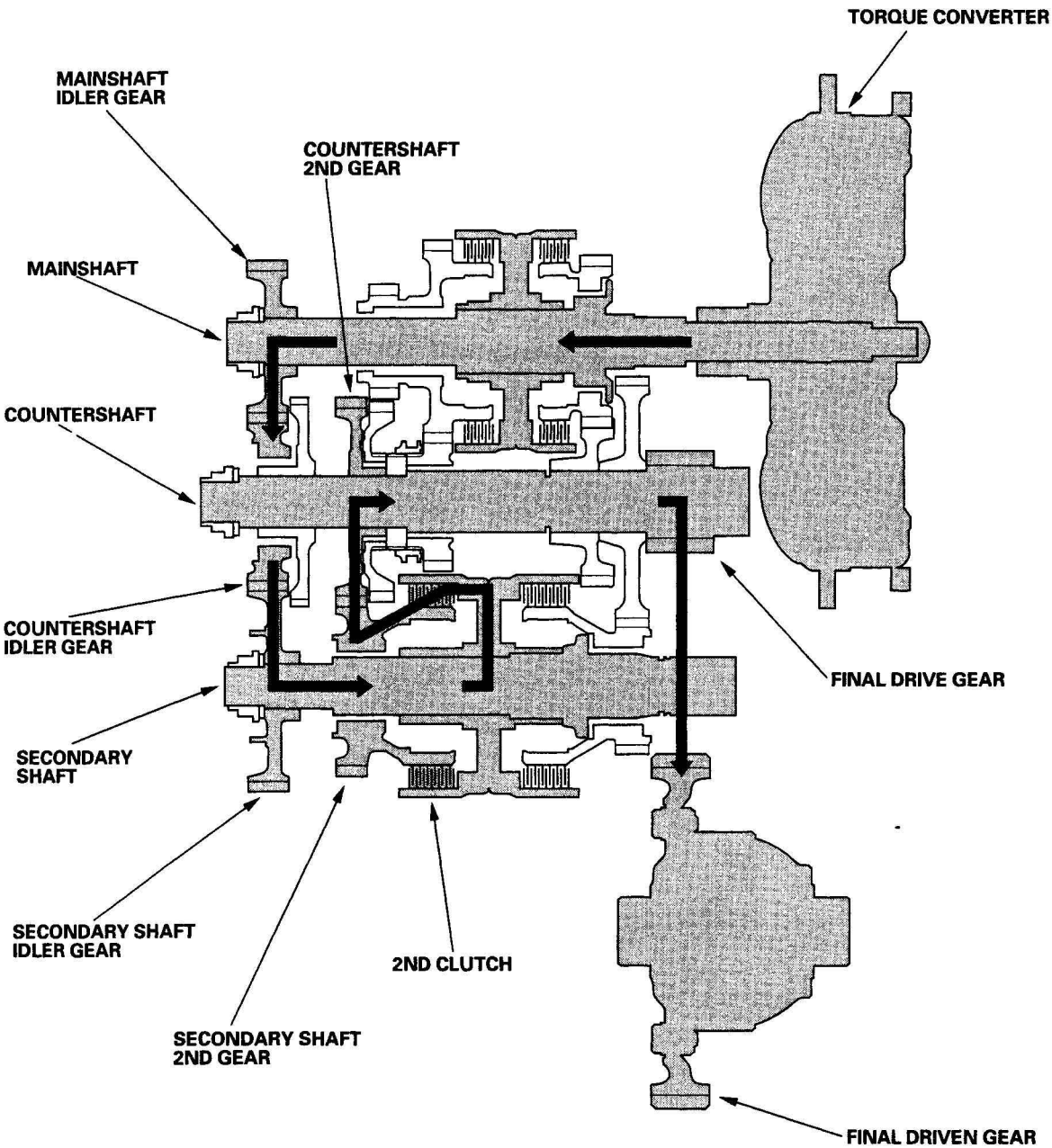


BACK

Protected by AR

D4 or D3 Position in 2nd gear and 2 Position

- Hydraulic pressure is applied to the 2nd clutch, then the 2nd clutch engages the secondary shaft 2nd gear with the secondary shaft.
- The mainshaft idler gear drives the secondary shaft via the countershaft idler gear and secondary shaft idler gear.
- The secondary shaft 2nd gear drives the countershaft 2nd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.



(cont'd)

BACK

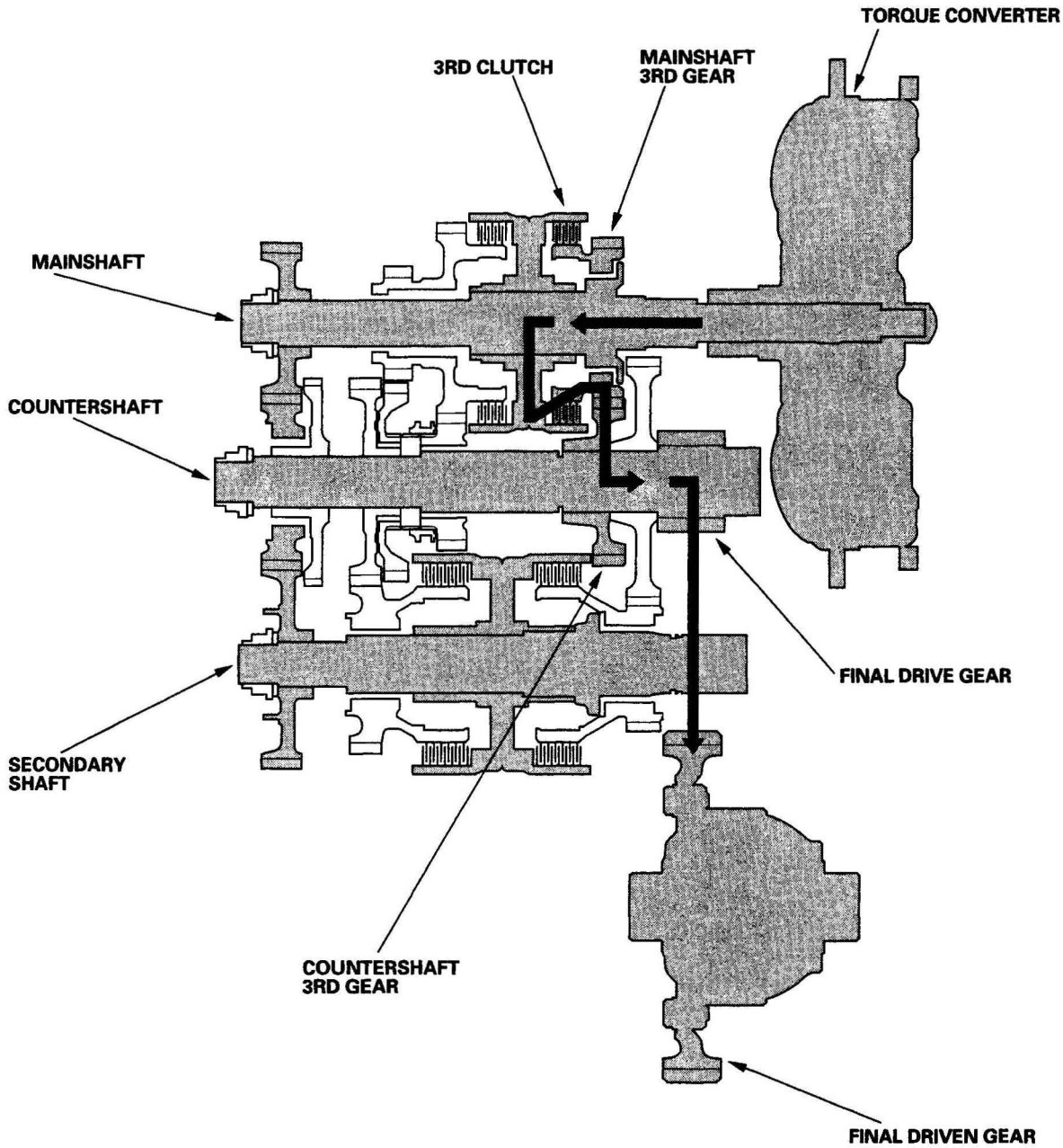
Protected by AR

System Description (cont'd)

Power Flow (cont'd)

D4 or D3 Position in 3rd gear

- Hydraulic pressure is applied to the 3rd clutch, then the 3rd clutch engages the mainshaft 3rd gear with the mainshaft.
- The mainshaft 3rd gear drives the countershaft 3rd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.

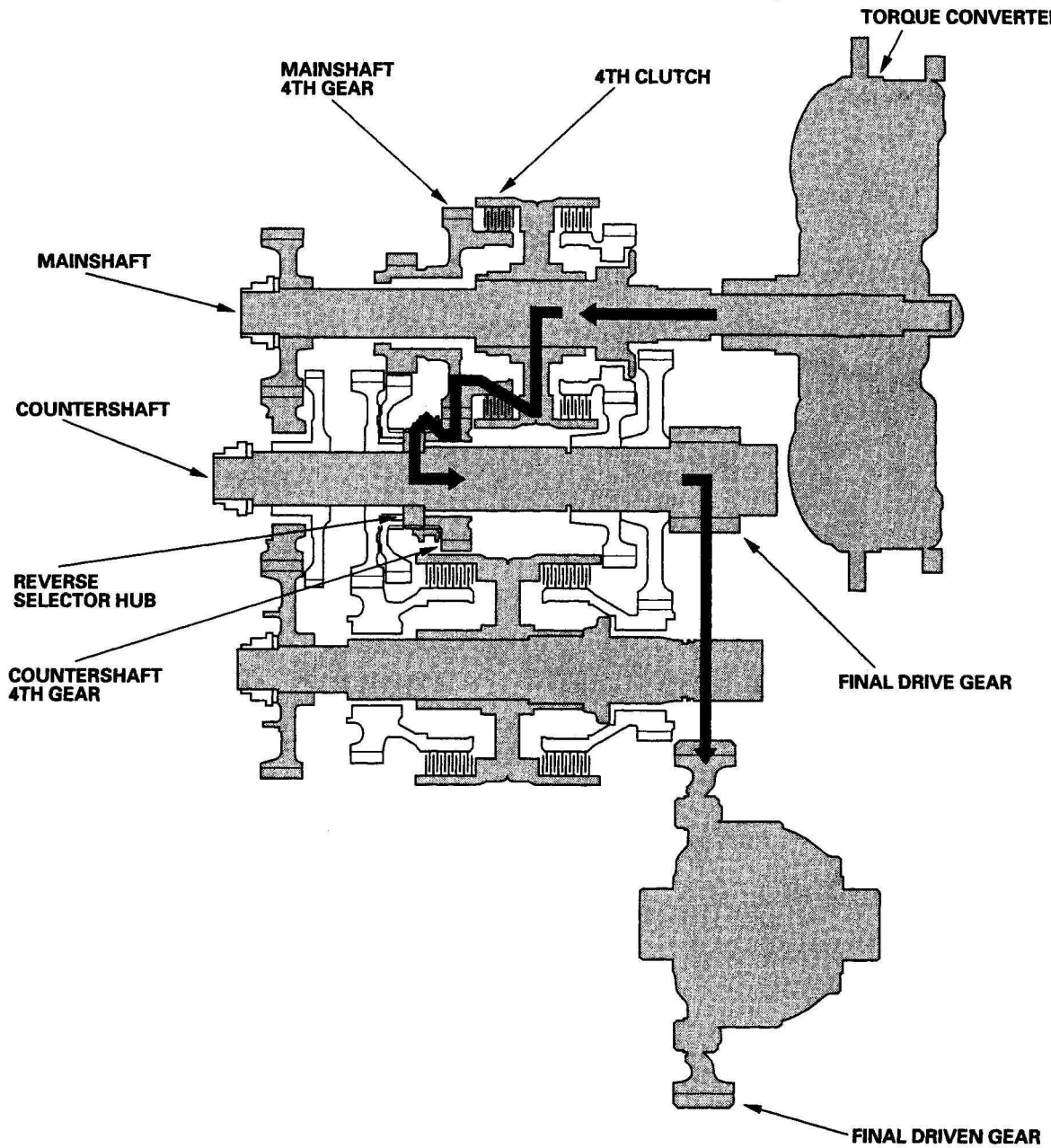


BACK

Protected by AR

D4 Position in 4th gear

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft 4th gear while the shift lever is in the forward range (D4, D3, 2 and 1 position).
- Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft 4th gear with the mainshaft.
- The mainshaft 4th gear drives the countershaft 4th gear, which drives the reverse selector hub and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.



(cont'd)

BACK

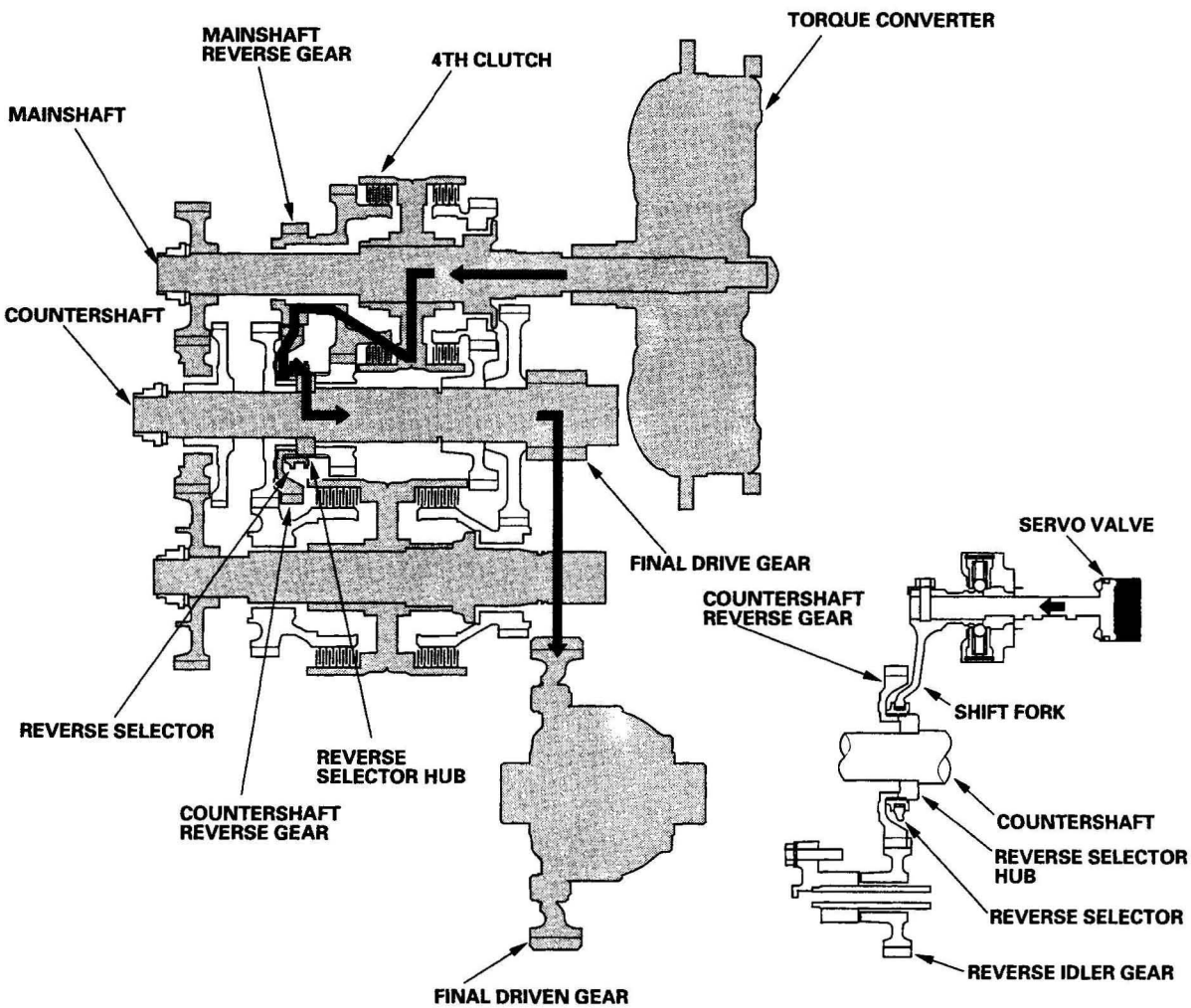
Protected by AR

System Description (cont'd)

Power Flow (cont'd)

Ⓡ Position

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft (reverse gear while the shift lever is in the Ⓡ position).
- Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft reverse gear with the mainshaft.
- The mainshaft reverse gear drives the countershaft reverse gear via the reverse idler gear.
- The rotation direction of the countershaft reverse gear is changed via the reverse idler gear.
- The countershaft reverse gear drives the countershaft via the reverse selector which drives the reverse selector hub.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.



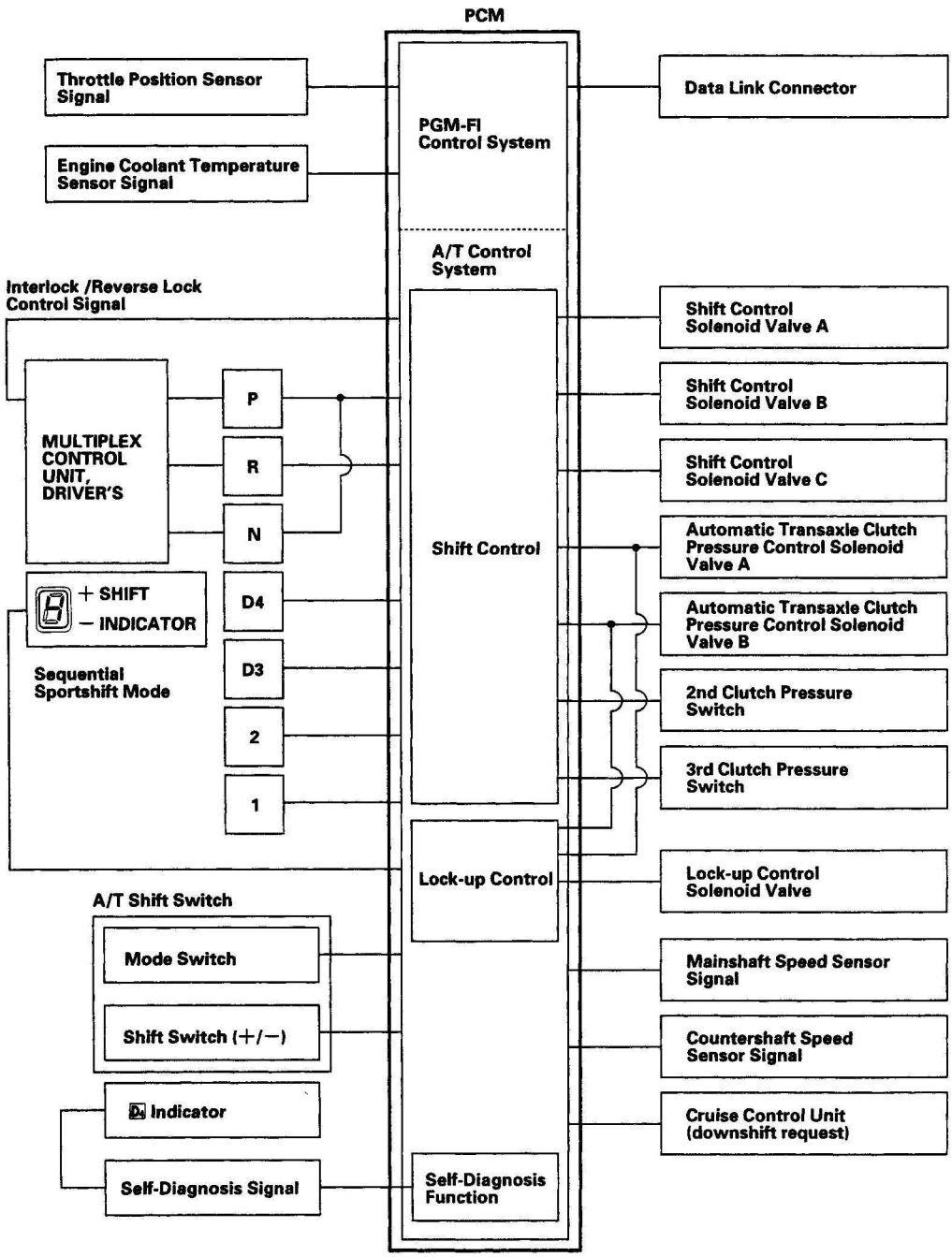
BACK

Protected by AR

Electronic Control System

Functional Diagram

The electronic control system consists of the Powertrain Control Model (PCM), sensors, and six solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel behind the center console.



(cont'd)

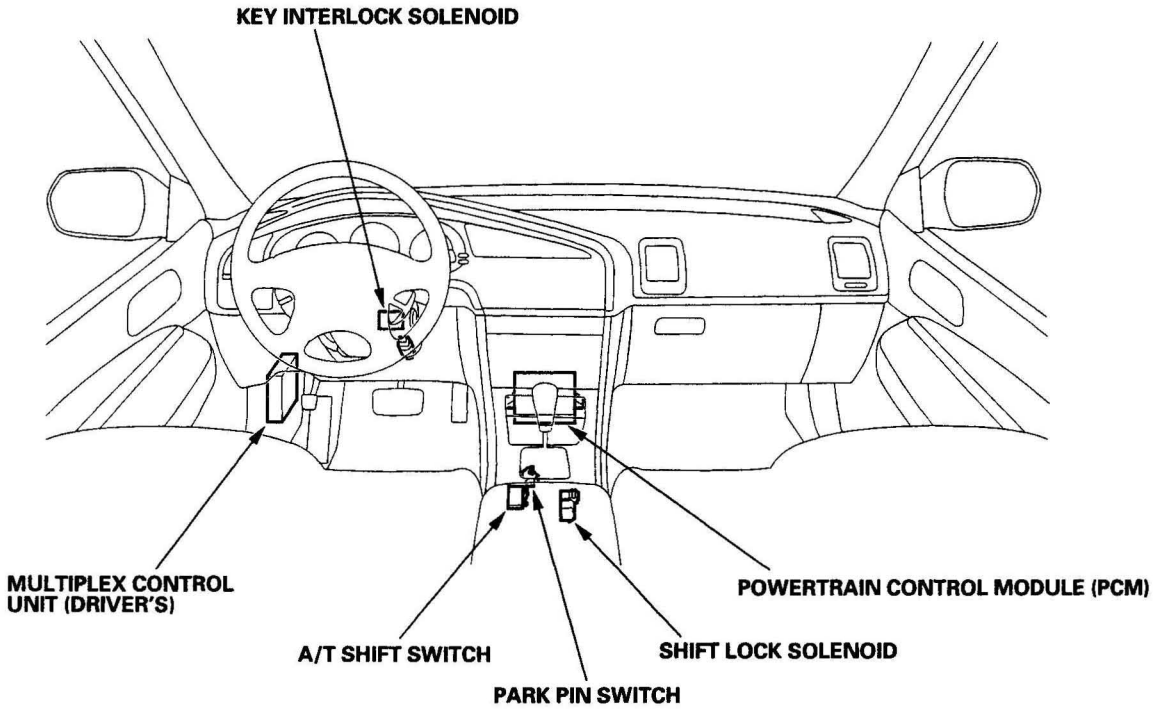
BACK

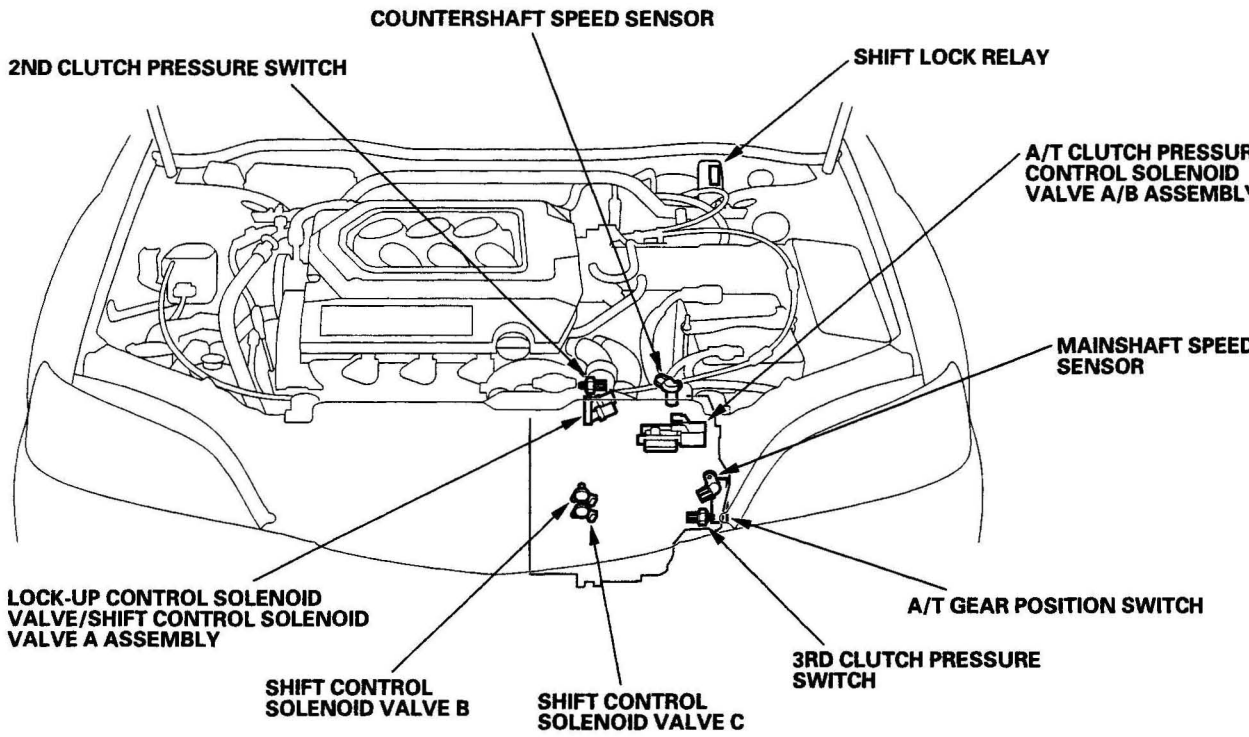
Protected by AR

System Description (cont'd)

Electronic Control System

Electronic Controls Location





BACK

Protected by AR

Shift Control

Shifting is related to engine torque through the solenoid valves, which are controlled by the PCM. The PCM instantly determines which gear should be selected by various signals sent from sensors, and actuates the shift control solenoid valves A, B, and C to control shifting. Also, a Grade Logic Control System has been adopted to control shifting in the D4 position while the vehicle is ascending or descending a slope, or reducing speed.
The combination of driving signals to shift control solenoid valves A, B, and C are shown in the table below.

Position	Gear position	Shift control solenoid valves		
		A	B	C
D4, D3	Shifting from the N position	ON	ON	ON
	Stays in 1st	OFF	ON	ON
	Shifting gears between 1st and 2nd	ON	ON	ON
	Stays in 2nd	ON	ON	OFF
	Shifting gears between 2nd and 3rd	ON	OFF	OFF
	Stays in 3rd	ON	OFF	ON
D4	Shifting gears between 3rd and 4th	OFF	OFF	ON
	Stays in 4th	OFF	OFF	OFF
2	2nd	ON	ON	OFF
1	1st	OFF	ON	ON
R	Shifting from the P and N position	OFF	ON	ON
	Stays in reverse	OFF	ON	OFF
	Reverse inhibit	OFF	ON	ON
P	Park	OFF	ON	OFF
N	Neutral	OFF	ON	OFF

NOTE: For a description of the reverse inhibit mode, refer to page 14-56.

Lock-up Control

The lock-up control solenoid valve controls modulator pressure to switch the lock-up shift valve and lock-up ON and OFF. The PCM controls the lock-up control solenoid valve and the A/T clutch pressure control solenoid valves A and B. When the lock-up control solenoid valve is turned ON, the condition of lock-up starts. The A/T clutch pressure control solenoid valves A and B regulate A/T clutch pressure control solenoid pressure and apply the pressure to the lock-up control valve and the lock-up timing valve. The lock-up control mechanism operates in 3rd and 4th gear in the D4, and in 3rd gear in the D3 positions.

(cont'd)

Protected by AR

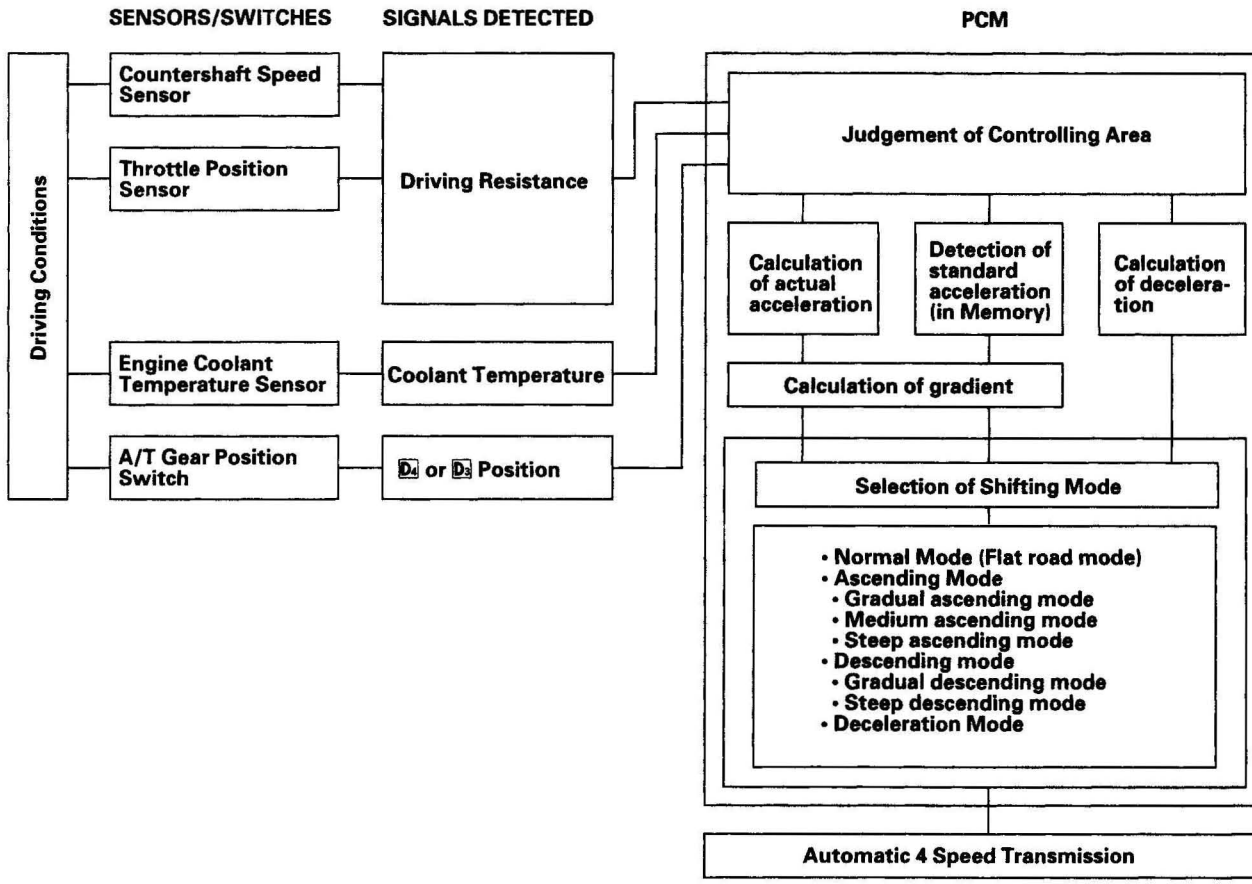
System Description (cont'd)

Electronic Control System (cont'd)

Grade Logic Control System

How it works:

The PCM compares actual driving conditions with memorized driving conditions, based on the input from the countershaft speed sensor, the throttle position sensor, the engine coolant temperature sensor, the brake switch signal, and the shift level position signal, to control shifting while the vehicle is ascending or descending a slope, or reducing speed.

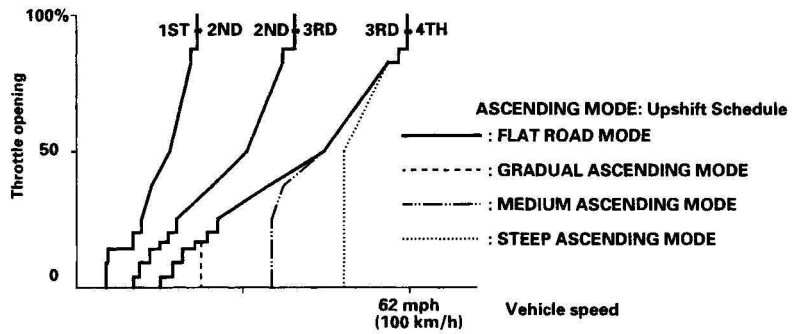


BACK

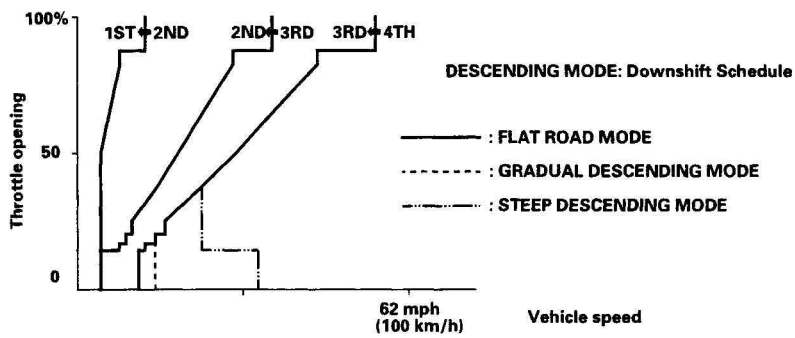
Protected by AR

Ascending Control
When the PCM determines that the vehicle is climbing a hill in D4 and D3 positions, the system extends the engagement area of 2nd gear and 3rd gear to prevent the transmission from frequently shifting between 2nd and 3rd gears, and between 3rd and 4th gears, so the vehicle can run smooth and have more power when needed.

NOTE: Shift schedules stored in the PCM between 2nd and 3rd gears, and between 3rd and 4th gears, enable to automatically select the most suitable gear according to the magnitude of a gradient.



Descending Control
When the PCM determines that the vehicle is going down a hill in D4 and D3 positions, the shift-up speed from 3rd to 4th gear and from 2nd to 3rd (when the throttle is closed) becomes faster than the set speed for flat road driving to widen the 3rd gear and 2nd gear driving areas. This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are two descending modes with different 3rd gear driving areas and 2nd gear driving areas according to the magnitude of a gradient stored in the PCM. When the vehicle is in 4th gear, and you are decelerating when you are applying the brakes on a steep hill, the transmission will downshift to 3rd gear. When you accelerate, the transmission will then return to higher gear.



Deceleration Control
When the vehicle goes around a corner, and needs to decelerate first and then accelerate, the PCM sets the data for deceleration control to reduce the number of times the transmission shifts. When the vehicle is decelerating from speeds above 27 mph (43 km/h), the PCM shifts the transmission from 4th to 2nd earlier than normal to cope with upcoming acceleration.

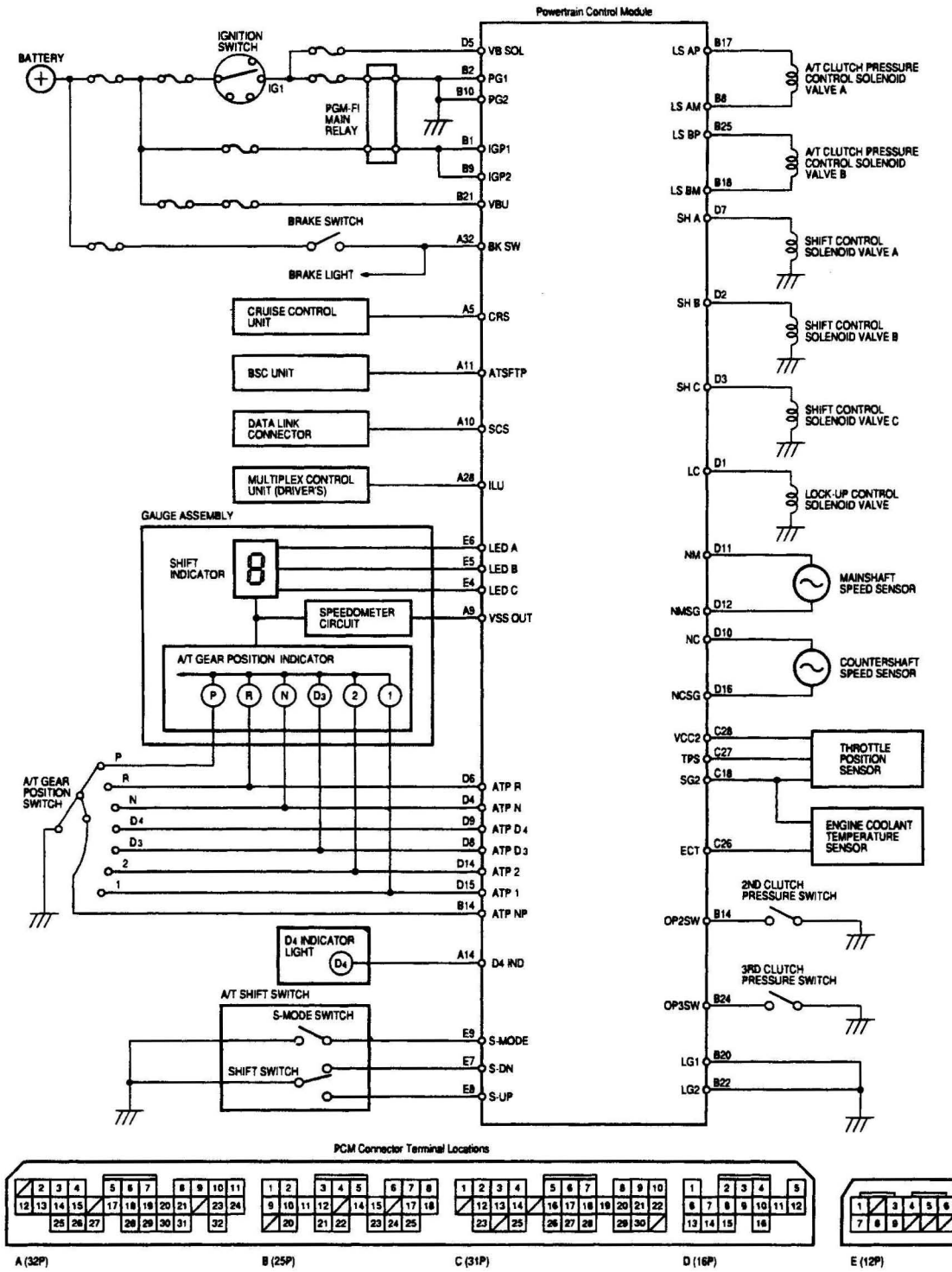
(cont'd)

Protected by AR

System Description (cont'd)

Electronic Control System (cont'd)

PCM Electrical Connections



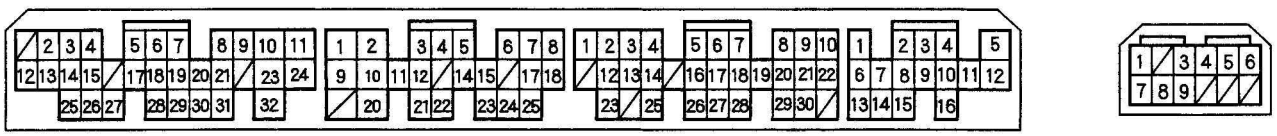
BACK

Protected by AR

PCM Inputs and Outputs

The PCM terminal voltage and measuring conditions for the A/T control system are shown. Other PCM terminal voltage and measuring conditions are described in section 11.

PCM Connector Terminal Locations



A (32P) B (25P) C (31P) D (16P) E (12P)

PCM CONNECTOR A (32P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
A5	BLU/GRN	CRS	Downshift signal input from cruise control unit	When cruise control is used: About 1V
A9	BLU/WHT	VSS OUT	Vehicle speed signal detected from countershaft speed sensor, and sent to speedometer and odometer	Depending on vehicle speed: Pulsing signal
A10	BRN	SCS	Timing and adjustment service check signal	With ignition switch ON (II) and data link connector open: 5 V With ignition switch ON (II) and data link connector connected with Honda PGM tester: 0 V
A14	GRN/BLK	D4 IND	D4 indicator control	When ignition switch is first turned ON (II): Approx. 7 V for 2 seconds In the D4 position: About 7 V
A28	WHT/RED	ILU	Interlock control	With ignition switch ON (II), brake pedal depressed, and accelerator pedal released: Battery voltage
A32	WHT/BLK	BK SW	Brake switch signal output	Brake pedal depressed: Battery voltage Brake pedal released: 0 V

(cont'd)

BACK

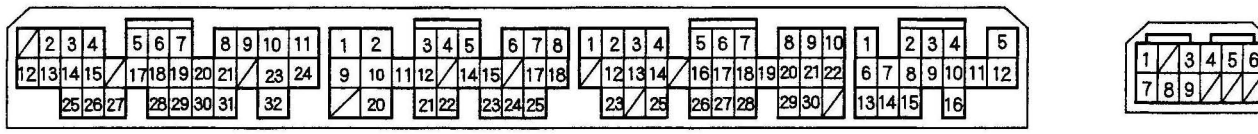
Protected by AR

System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs

PCM Connector Terminal Locations



A (32P) B (25P) C (31P) D (16P) E (12P)

PCM CONNECTOR B (25P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
B1	YEL/BLK	IGP1	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B2	BLK	PG1	Ground	
B8	WHT	LS AM	A/T clutch pressure control solenoid valve A power supply negative electrode	
B9	YEL/BLK	IGP2	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B10	BLK	PG2	Ground	
B14	BLU/WHT	ATP NP	A/T gear position switch P and N positions input	In the P and N positions: 0 V In other than the P and N position: Battery voltage
B17	RED	LS AP	A/T clutch pressure control solenoid valve A power supply positive electrode	With ignition switch ON (II): Pulsing signal
B18	GRN	LS BM	A/T clutch pressure control solenoid valve B power supply negative electrode	
B20	BRN/BLK	LG1	Ground	
B21	WHT/YEL	VBU	Back-up power supply	Always battery voltage
B22	BRN/BLK	LG2	Ground	
B24	WHT/RED	OP3SW	A/T 3rd clutch pressure switch signal input	With ignition switch ON (II): Battery voltage (No 3rd clutch pressure)
B25	ORN	LS BP	A/T clutch pressure control solenoid valve B power supply positive electrode	With ignition switch ON (II): Pulsing signal

BACK

Protected by AR

PCM CONNECTOR D (16P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
D1	YEL	LC	Lock-up control solenoid valve control	During half and full lock-up conditions, and during deceleration condition: Battery voltage During no lock-up condition: 0 V
D2	GRN/WHT	SH B	Shift control solenoid valve B control	Battery voltage in these positions: • 1, 2 . • D4, and D3 in 1st and 2nd gear • P, R, and N 0 V in these positions: • D4, and D3 in 3rd gear • D4 in 4th gear
D3	GRN	SH C	Shift control solenoid valve C control	Battery voltage in these positions: • 1 • D4, and D3 in 1st and 3rd gear 0 V in these positions: • 2 • D4, and D3 in 2nd gear • D4 in 4th gear • P, R, and N
D4	RED/BLK	ATP N	A/T gear position switch N position input	In the N position: 0 V In other than the N position: Battery voltage
D5	BLK/YEL	VB SOL	Power supply for solenoid valves (Fuse No.6 in driver's under-dash fuse/relay box)	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
D6	WHT	ATP R	A/T gear position switch R position input	In the R position: 0 V In other than the R position: Battery voltage
D7	BLU/YEL	SH A	Shift control solenoid valve A control	Battery voltage in these positions: • 2 • D4, and D3 in 2nd and 3rd gear 0 V in these positions: • 1 • D4, and D3 in 1st gear • D4 in 4th gear • P, R, and N
D8	PNK	ATP D3	A/T gear position switch D3 position input	In the D3 position: 0 V In other than the D3 position: Battery voltage
D9	YEL	ATP D4	A/T gear position switch D4 position input	In the D4 position: 0 V In other than the D4 position: Battery voltage
D10	BLU	NC	Countershaft speed sensor input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: About 0 V
D11	RED	NM	Mainshaft speed sensor input	Depending on vehicle speed: Pulsing signal When engine is stopped: About 0 V
D12	WHT	NMSG	Mainshaft speed sensor ground	
D13	BLU/BLK	OP2SW	A/T 2nd clutch pressure switch signal input	With ignition switch ON (II): Battery voltage (No 2nd clutch pressure)
D14	BLU	ATP 2	A/T gear position switch 2 position input	In the 2 position: 0 V In other than the 2 position: Battery voltage
D15	BRN	ATP 1	A/T gear position switch 1 position input	In the 1 position: 0 V In other than the 1 position: Battery voltage
D16	GRN	NCSG	Countershaft speed sensor ground	

(cont'd)

BACK

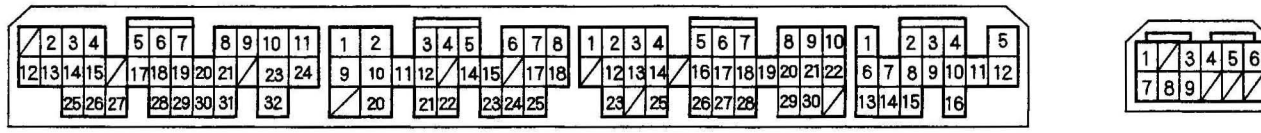
Protected by AR

System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs

PCM Connector Terminal Locations



A (32P) B (25P) C (31P) D (16P) E (12P)

PCM CONNECTOR E (12P)

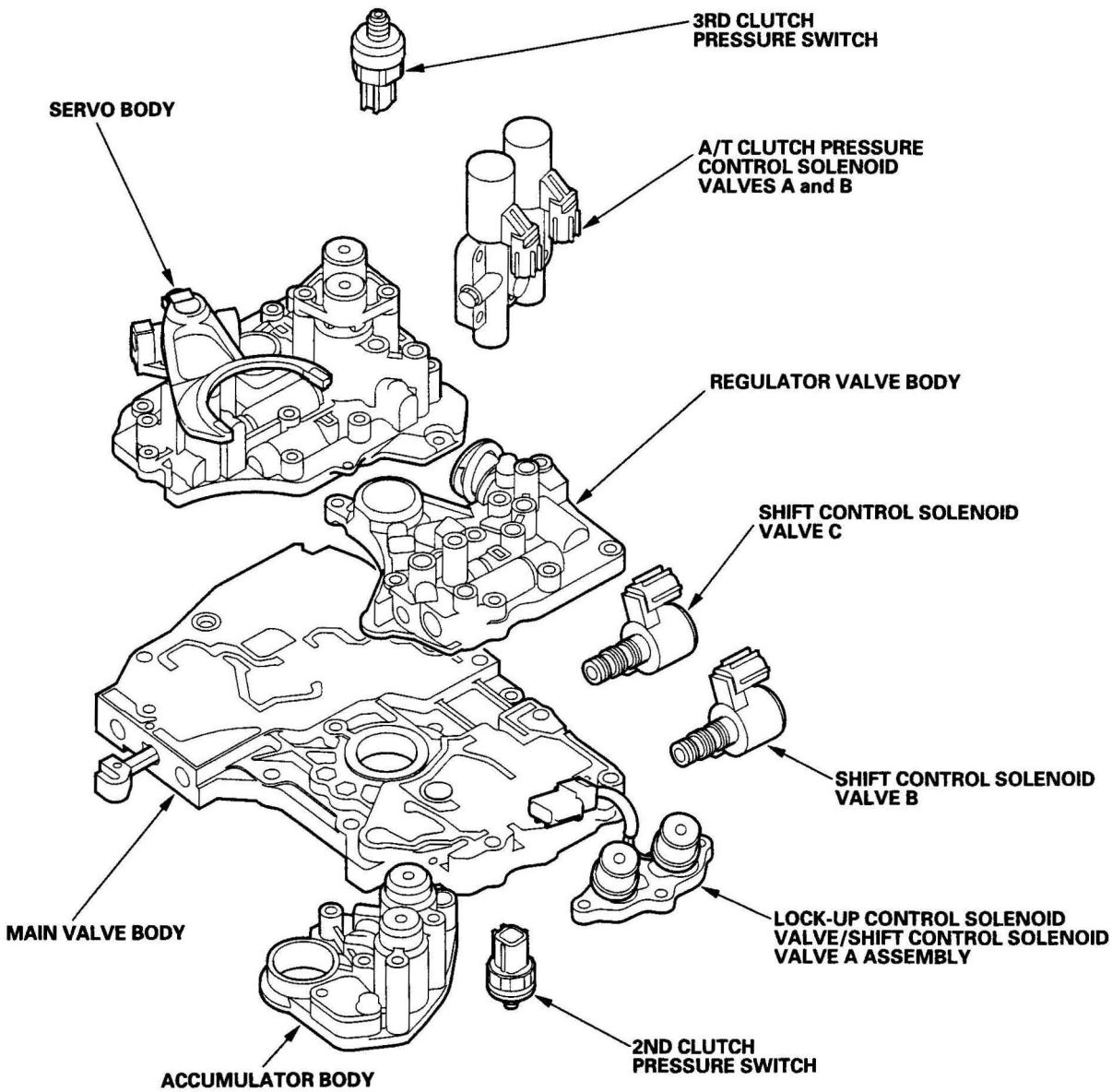
Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
E4	BLU/BLK	LED C	Shift indicator control	In sequential sportshift mode: • 1st and 3rd gear positions: Battery voltage • 2nd and 4th gear positions: 0 V
E5	BLU/GRN	LED B	Shift indicator control	In sequential sportshift mode: • 2nd and 3rd gear positions: Battery voltage • 1st and 4th gear positions: 0 V
E6	BLU/RED	LED A	Shift indicator control	In sequential sportshift mode: • 4th gear position: Battery voltage • 1st, 2nd, and 3rd gear positions: 0 V
E7	ORN	S-DN	Downshift switch signal input	In sequential sportshift mode and shift lever pushed toward downshift position (marked with "−"): 0 V In sequential sportshift mode and shift lever in neutral position: 5 V
E8	YEL	S-UP	Upshift switch signal input	In sequential sportshift mode and shift lever pushed toward upshift position (marked with "+"): 0 V In sequential sportshift mode and shift lever in neutral position: 5 V
E9	RED	S-MODE	Sequential sportshift A/T shift switch signal input	In sequential sportshift mode (shift lever is positioned in sequential sportshift mode): 0 V In other than sequential sportshift mode: 5 V

BACK

Protected by AR

Hydraulic Controls

The valve body includes the main valve body, the regulator valve body, the servo body and the accumulator body. The ATF pump is driven by splines on the left end of the torque converter which is attached to the engine. Fluid flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, directing pressure to each of the clutches. The shift control solenoid valves B and C are mounted on the outside of the torque converter housing. The shift control solenoid valve A and the lock-up control solenoid valve are mounted on the torque converter housing as an assembly. The A/T clutch pressure control solenoid valves A and B are mounted on the transmission housing.



(cont'd)

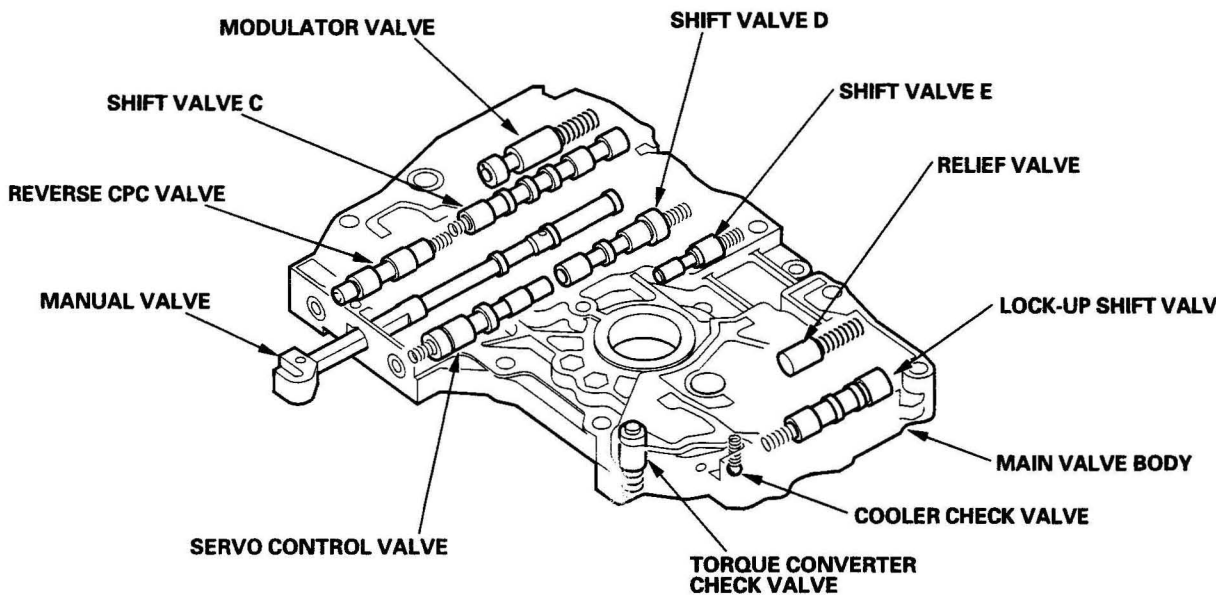
Protected by AR

System Description (cont'd)

Hydraulic Controls (cont'd)

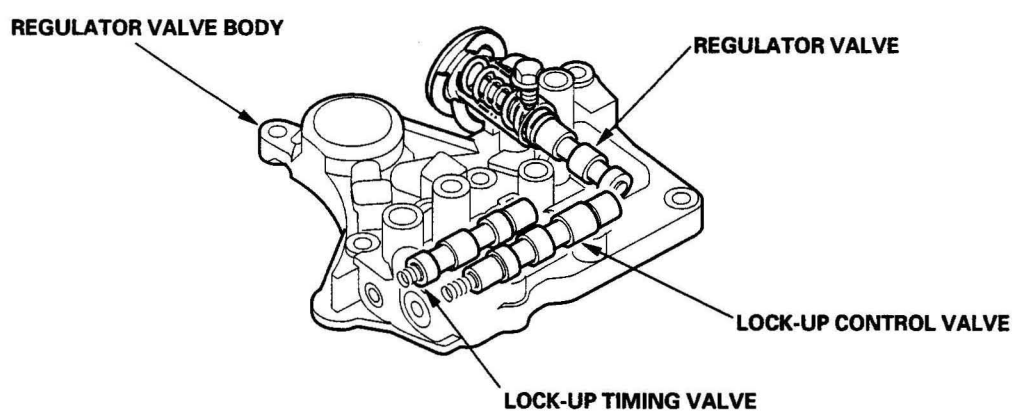
Main Valve Body

The main valve body contains the manual valve, the modulator valve, the shift valve C, the shift valve D, the shift valve E, the servo control valve, the cooler check valve, the torque converter check valve, the reverse CPC valve, the lock-up shift valve, the relief valve, and the ATF pump gears. The primary function of the main valve body is to switch fluid pressure on and off and to control hydraulic pressure going to the hydraulic control system.



Regulator Valve Body

The regulator valve body is located on the main valve body. The regulator valve body contains the regulator valve, the lock-up timing valve, and the lock-up control valve.



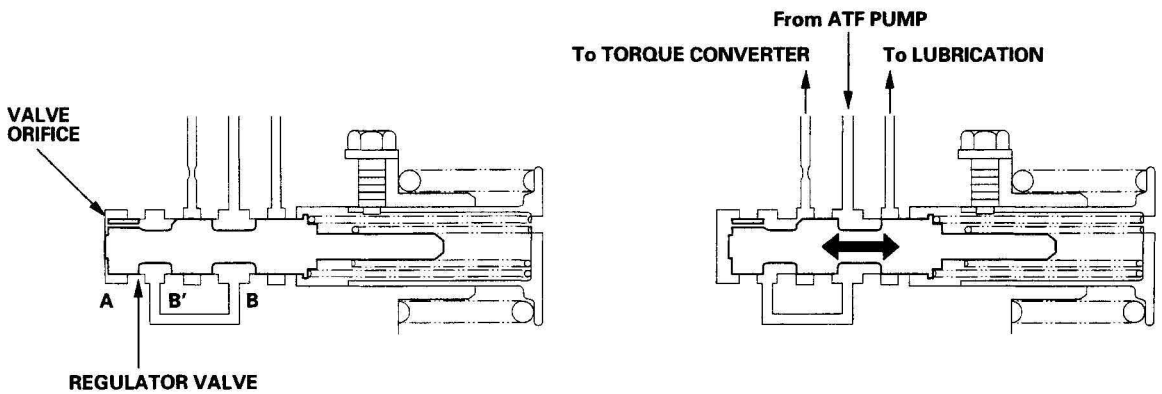
BACK

Protected by AR

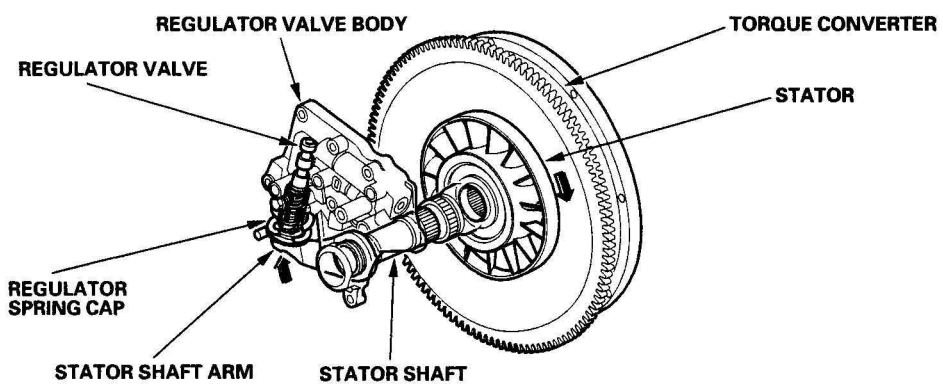
Regulator Valve

The regulator valve maintains constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubricating system and torque converter. Fluid from the ATF pump flows through B and B'. Fluid entering from B flows through the valve orifice to the A cavity. This pressure of the A cavity pushes the regulator valve to the right side, and this movement of the regulator valve uncovers the fluid port to the torque converter and the relief valve. The fluid flows out to the torque converter and the relief valve, and the regulator valve moves to the left side. According to the level of the hydraulic pressure through B, the position of the regulator valve changes, and the amount of fluid from B' through torque converter changes. This operation is continued, maintaining the line pressure.

NOTE: When used, "left" or "right" indicates direction on the illustration below.



Increases in hydraulic pressure according to torque are performed by the regulator valve using stator torque reaction. The stator shaft is splined with the stator in the torque converter, and its arm end contacts the regulator spring cap. When the vehicle is accelerating or climbing (Torque Converter Range), stator torque reaction acts on the stator shaft, and the stator arm pushes the regulator spring cap in the direction of the arrow in proportion to the reaction. The stator reaction spring compresses, and the regulator valve moves to increase the line pressure which is regulated by the regulator valve. The line pressure reaches its maximum when the stator torque reaction reaches its maximum.



(cont'd)

BACK

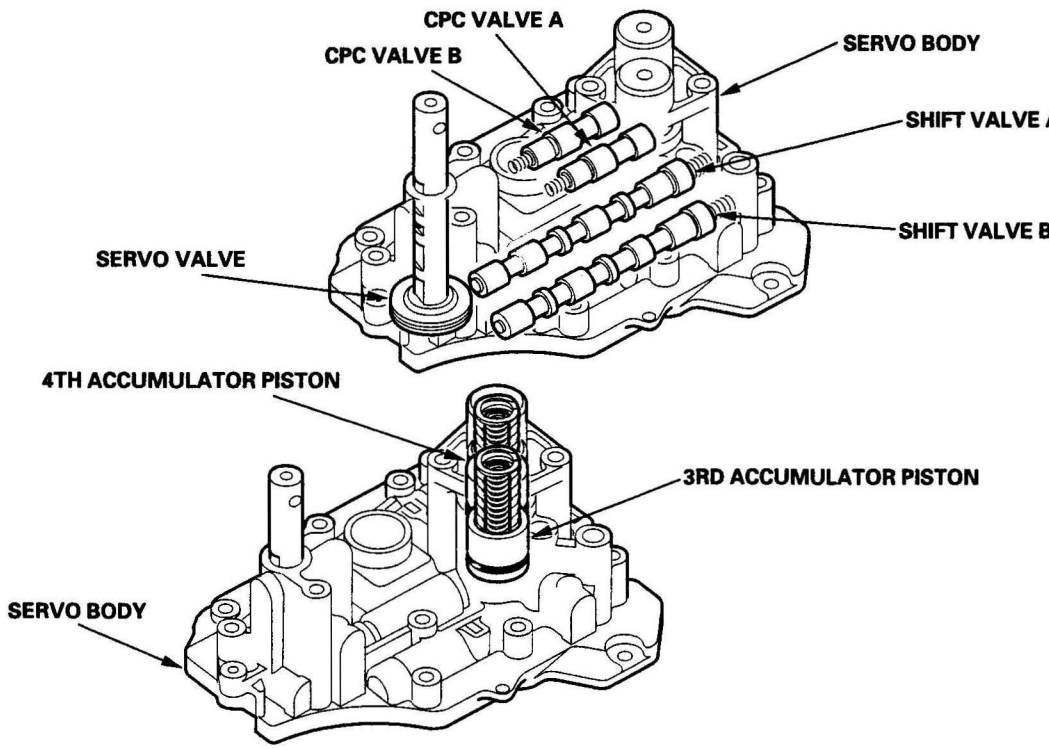
Protected by AR

System Description (cont'd)

Hydraulic Controls (cont'd)

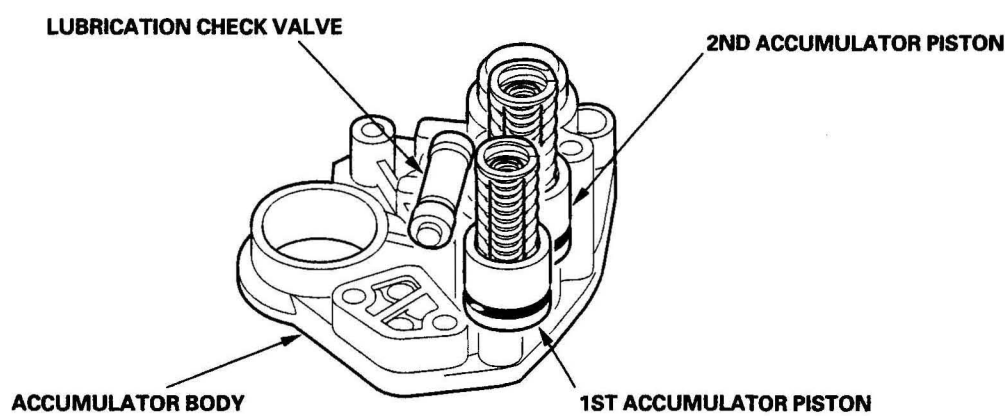
Servo Body

The servo body is on the main valve body. It contains the servo valve, the shift valve A, the shift valve B, the CPC valves A and B, and the 3rd and the 4th accumulators.



Accumulator Body

The accumulator body is on the torque converter housing, next to the main valve body. It contains the 1st and the 2nd accumulators, and the lubrication check valve.



BACK

Protected by AR

Hydraulic Flow

Distribution of Hydraulic Pressure

As the engine turns, the ATF pump starts to operate. Automatic transmission fluid (ATF) is drawn through the ATF strainer (filter) and discharged into the hydraulic circuit. Then, ATF flowing from the ATF pump becomes line pressure that's regulated by the regulator valve. Torque converter pressure from the regulator valve enters the torque converter through the lock-up shift valve and it is discharged from the torque converter. The torque converter check valve prevents torque converter pressure from rising.

The PCM controls the shift control solenoid valves ON and OFF, and the shift control solenoid valves control shift solenoid pressure to the shift valves. Applying shift control solenoid pressure to the shift valves moves the position of the shift valve, and switches the port of hydraulic pressure. The PCM also controls A/T clutch pressure control solenoid valves A and B. The A/T clutch pressure control solenoid valves regulate the A/T clutch pressure control solenoid pressure and apply the A/T clutch pressure control solenoid pressure to CPC valves A and B.

When shifting between upper gear and lower gear, the clutch is engaged by pressure from the CPC pressure mode. The PCM controls one of the shift control solenoid valves to move the position of the shift valve. This movement switches the port of the CPC and line pressure. Line pressure is then applied to the clutch, and the CPC pressure is intercepted. Engaging the clutch with line pressure happens when shifting is completed.

Hydraulic pressure at the ports is as follows:

PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE
1	LINE	5H	CPC B or LINE	57	LS B
3	LINE	5J	CPC B or LINE	58	LS A or LS B
3'	LINE	5K	CPC B or LINE	90	TORQUE CONVERTER
3''	LINE	5K'	CPC B or LINE	90'	TORQUE CONVERTER
4	LINE	6	MODULATE	91	TORQUE CONVERTER
4'	LINE	SA	SH A	91'	TORQUE CONVERTER
4''	LINE	SB	SH B	92	TORQUE CONVERTER
4A	CPC A	SC	SH C	93	ATF COOLER
4B	CPC B	LA	LC	94	TORQUE CONVERTER
5A	CPC A	9	LINE	95	LUBRICATION
5D	CPC B	10	1ST CLUTCH	95'	LUBRICATION
5B	CPC A or LINE	20	2ND CLUTCH	96	TORQUE CONVERTER
5E	CPC A or LINE	25	LINE	97	TORQUE CONVERTER
5F	CPC A or LINE	30	3RD CLUTCH	99	SUCTION
5F'	CPC A or LINE	40	4TH CLUTCH	X	DRAIN
5C	CPC B or LINE	41	4TH CLUTCH	HX	HIGH POSITION DRAIN
5G	CPC B or LINE	56	LS A	AX	AIR DRAIN

NOTE:
- CPC: Clutch Pressure Control pressure
- SH: Shift Control Solenoid pressure
- LS: A/T Clutch Pressure Control Solenoid pressure
- LC: Lock-up Control Solenoid pressure

(cont'd)

BACK

Protected by AR

System Description (cont'd)

Hydraulic Flow (cont'd)

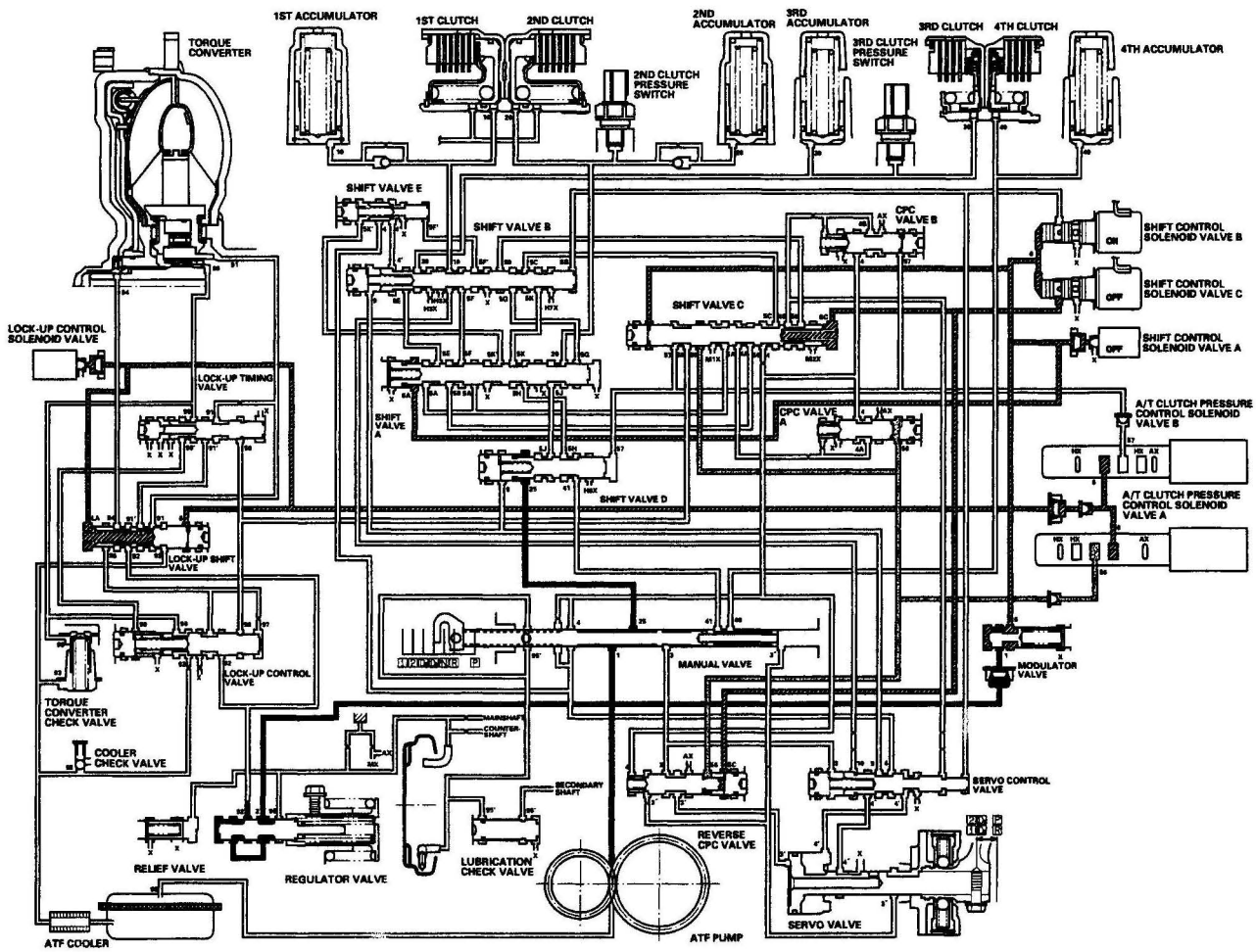
[N] Position

The PCM controls the shift control solenoid valves. The conditions of the shift control solenoid valve and positions of the shift valve are as follows:

- The shift control solenoid valve A is turned OFF, and the shift valve A is moved to the left side.
- The shift control solenoid valve B is turned ON, and the shift valve B remains in the right side.
- The shift control solenoid valve C is turned OFF, and the shift valve C remains in the left side.

Line pressure (1) passes through the manual valve and stops at shift valve D. Line pressure (1) also flows to the modulator valve, and becomes modulator pressure (6). Modulator pressure (6) flows to the shift control solenoid valves and the A/T clutch pressure control solenoid valves. Under this condition, hydraulic pressure is not applied to the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



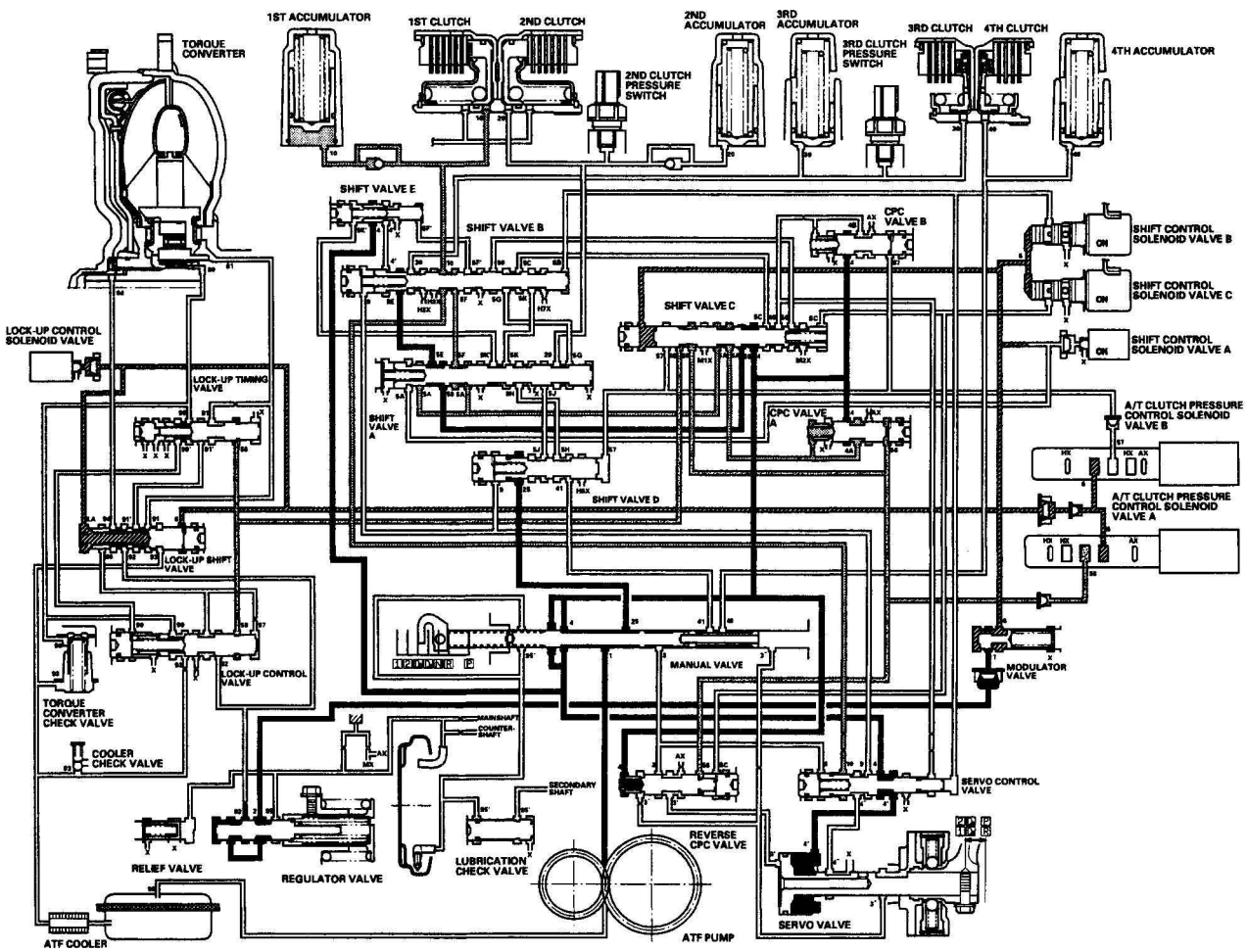
BACK

Protected by AR

D4 Position: 1st gear shifting from N position

The PCM turns the shift control solenoid valves A and C ON when shifting to D4 position from N. Shift control solenoid valve B remains ON. Shift control solenoid valve C is turned ON, and SH C pressure (SC) in the right side of the shift valve C is released, then the shift valve C is moved to the right side. Shift control solenoid valve A is turned ON, and SH A pressure (SA) in the left side of the shift valve A is released, then shift valve A is moved to the right side. The A/T clutch pressure control solenoid valve A regulates LS A pressure (56) and applies it to CPC valve A. Line pressure (1) becomes line pressure (4) at the manual valve, and flows to shift valve C and CPC valve A. Line pressure (4) becomes CPC A pressure (4A) and passes through shift valve C, A, and B, then CPC A pressure (4A) becomes 1st clutch pressure (10) at shift valve B. 1st clutch pressure (10) is applied to the 1st clutch, then the 1st clutch is engaged with pressure of the CPC pressure mode. Line pressure (4) passes through shift valve A and B, then stops at shift valve B.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Protected by AR

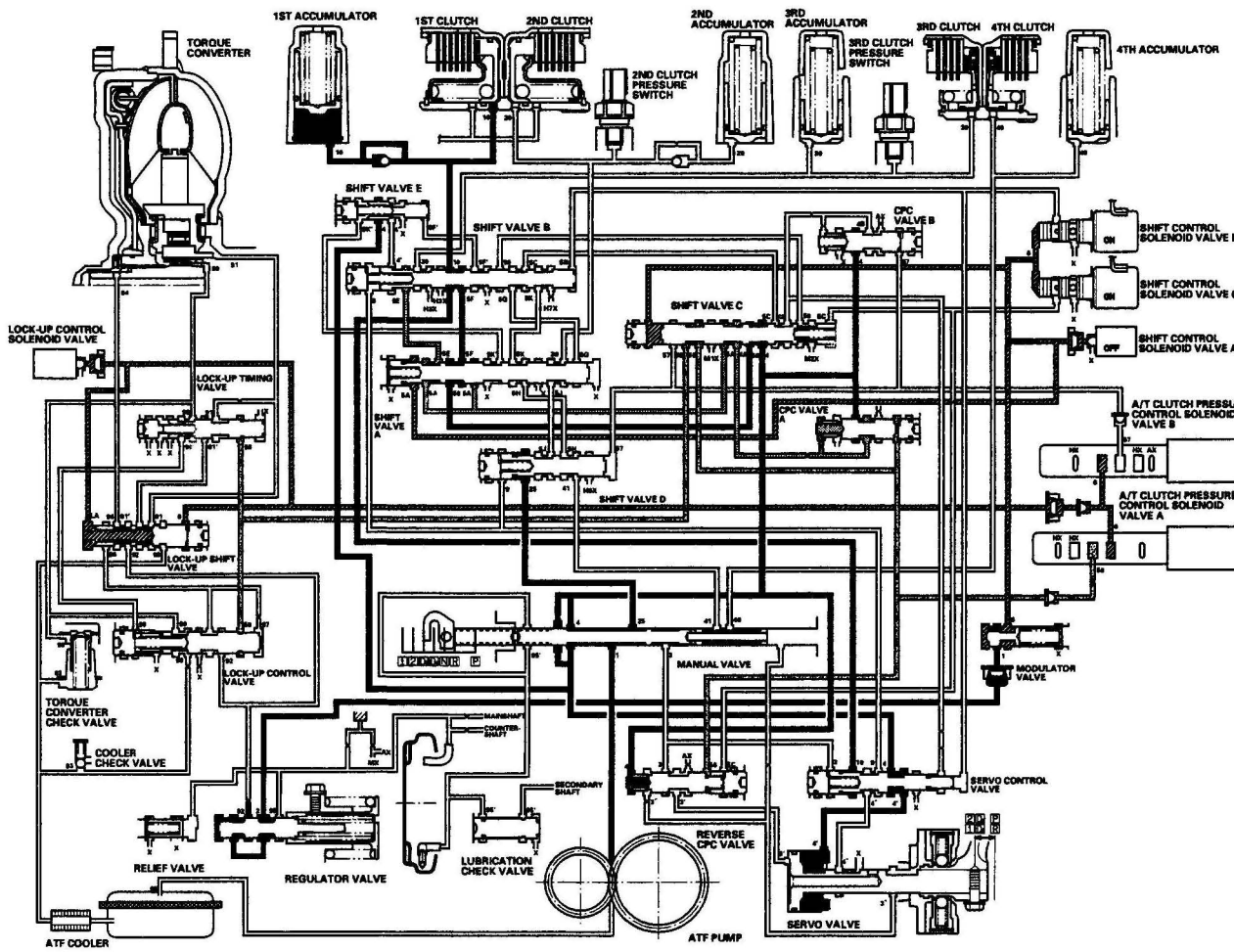
System Description (cont'd)

Hydraulic Flow (cont'd)

D4 Position: Driving in 1st gear

The PCM turns shift control solenoid valve A OFF, but shift control solenoid valves B and C remain ON. SH A pressure (SA) is applied to the left side of shift valve A, then shift valve A is moved to the left side. This movement switches the port of line pressure and CPC pressure on shift valve A. The 1st clutch pressure is changed to line pressure mode, and the 1st clutch is engaged securely. CPC A pressure (5E) stops at shift valve B.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



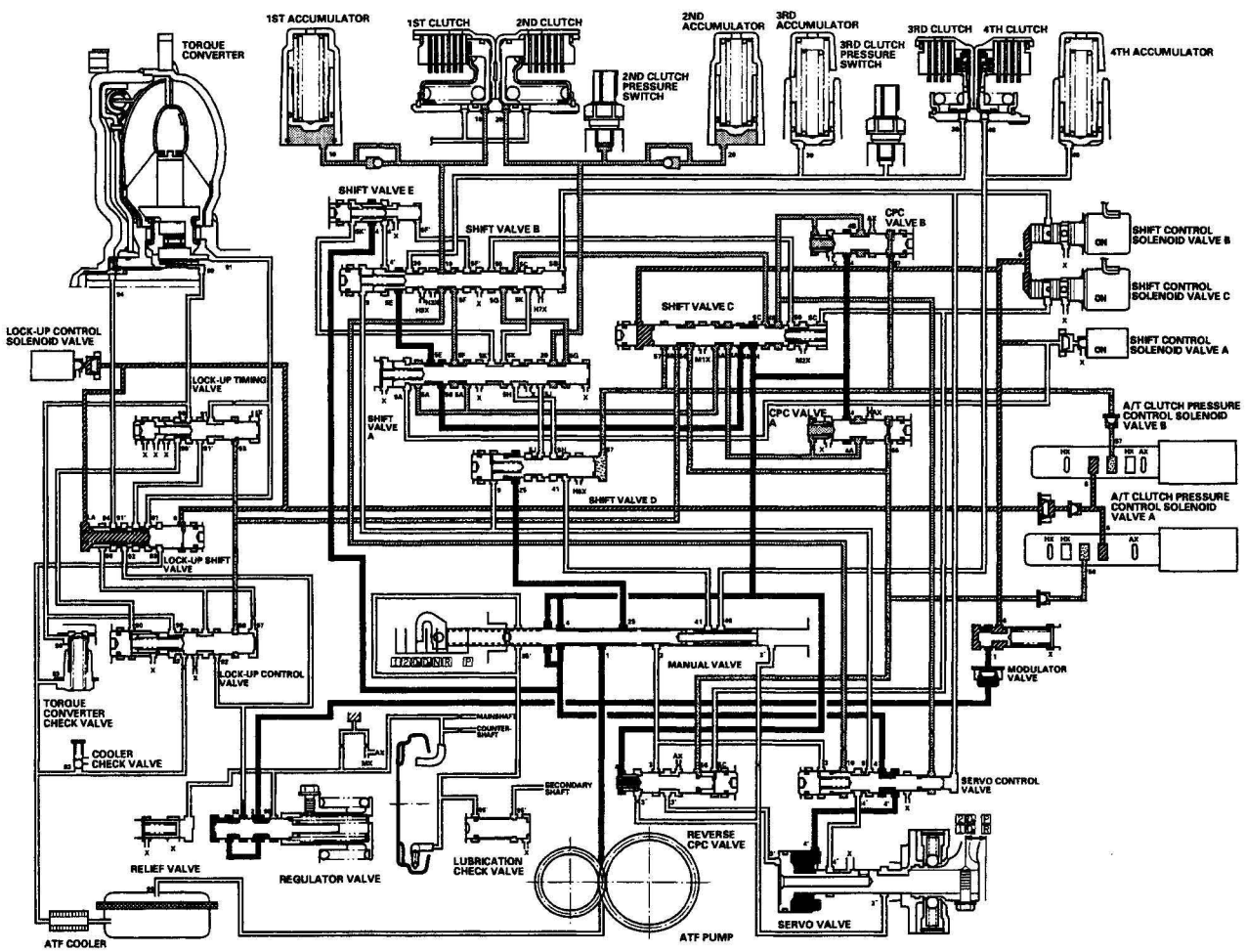
BACK

Protected by AR

D4 Position: Shifting between 1st gear and 2nd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift control solenoid valve A OFF. Shift control solenoid valves B and C remain ON. Then shift control solenoid valve A is turned ON, and SH A pressure (SA) in the left side of the shift valve A is released. Shift valve A is moved to the right side to switch the port of line pressure and CPC pressure. The PCM also controls the A/T clutch pressure control solenoid valves. The A/T clutch pressure control solenoid valves A and B apply their pressure to the CPC valves A and B. Line pressure (4) becomes CPC B pressure (4B) at the CPC valve B, and CPC B pressure passes through shift valves C, B, and A, to become 2nd clutch pressure. The 1st and 2nd clutches are engaged with the CPC pressure mode.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

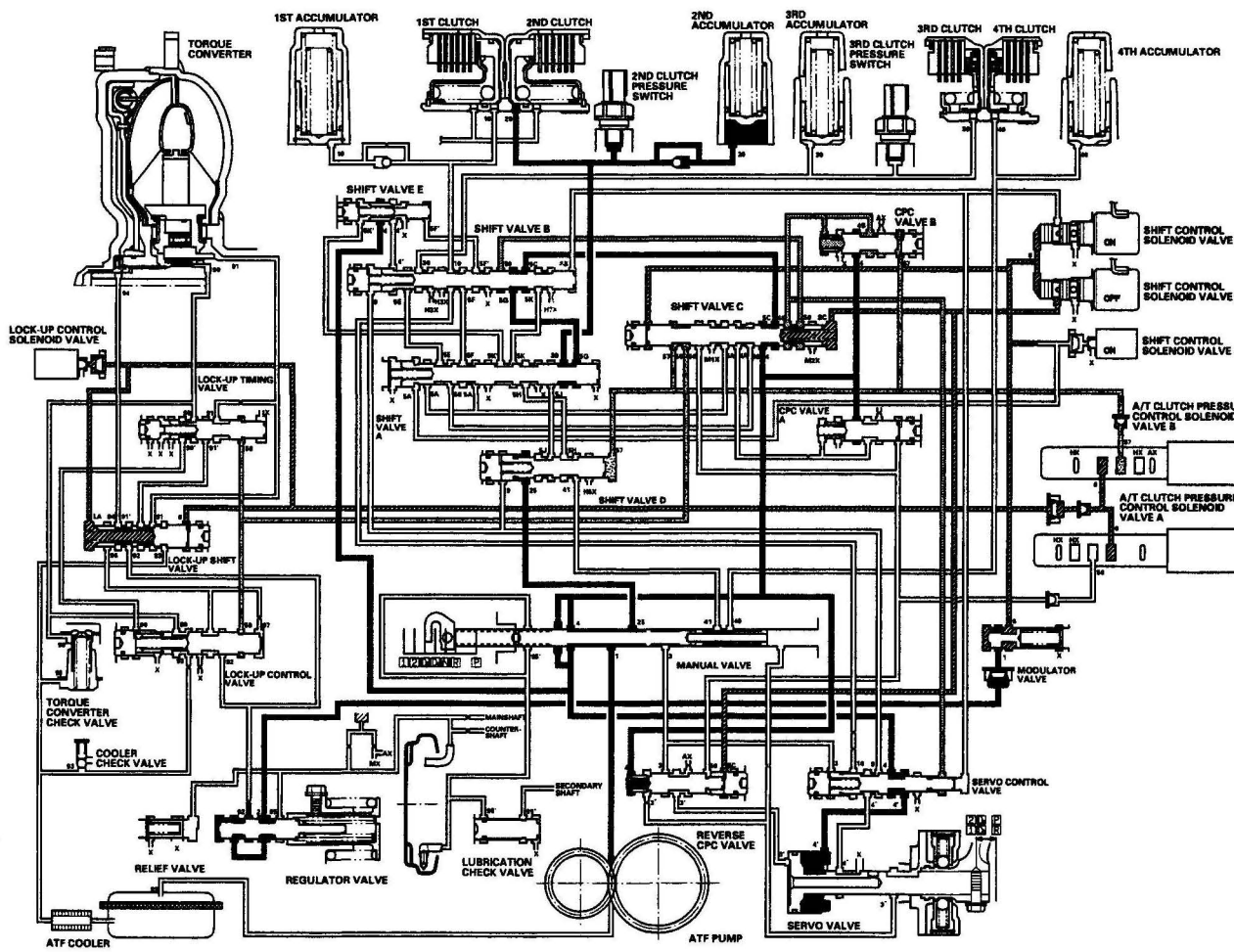
System Description (cont'd)

Hydraulic Flow (cont'd)

D4 Position: Driving in 2nd gear

The PCM turns shift control solenoid valve C OFF, and controls A/T clutch pressure control solnoid valve A to release LS A pressure (56). Shift control solenoid valves A and B remain ON. Releasing LS A pressure in the CPC valve A releases CPC A pressure in the 1st clutch pressure circuit. Shift control solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of shift valve C. Then shift valve C is moved to the left side to switch the port of line pressure and CPC pressure. The 2nd clutch pressure is changed to line pressure mode, and the 2nd clutch is engaged securely. The CPC B pressure (5D) stops at shift valve B.

NOTE: When used, "left" or "right" indicate direction on the hydraulic circuit.



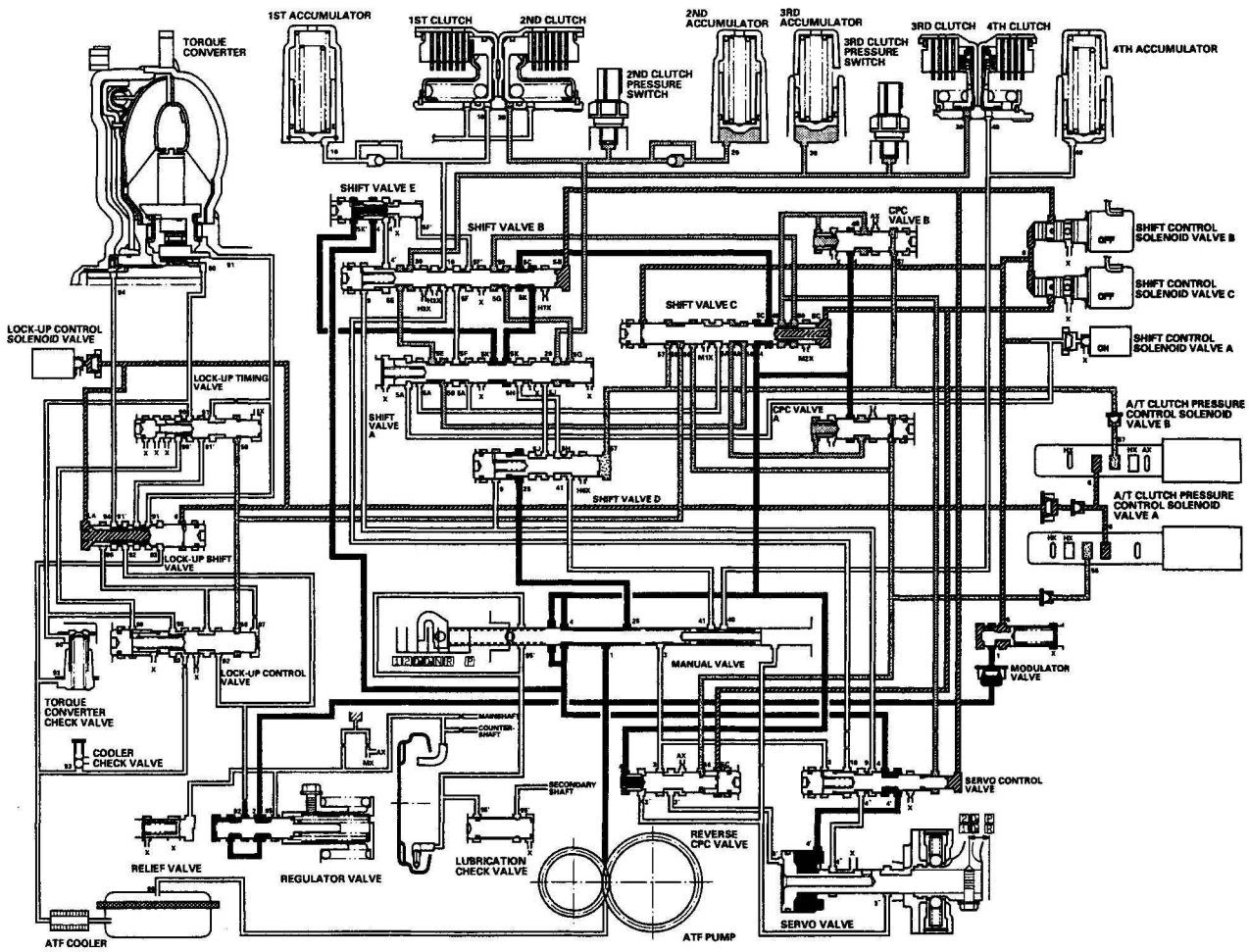
BACK

Protected by AR

D4 Position: Shifting between 2nd gear and 3rd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift control solenoid valve B OFF. The PCM also controls A/T clutch pressure control solenoid valve A to apply LS A pressure (56) to CPC valve A. Shift control solenoid valve A remains ON, and C remains OFF. Shift control solenoid valve B is turned OFF, and SH B pressure (SB) is applied to the right side of shift valve B. Then shift valve B is moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) becomes CPC A pressure (4A) at the CPC valve A. The CPC A pressure (4A) becomes 3rd clutch pressure (30) at shift valve B, and flows to the 3rd clutch. The 2nd clutch pressure is changed to CPC pressure mode by switching the position of shift valve B.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

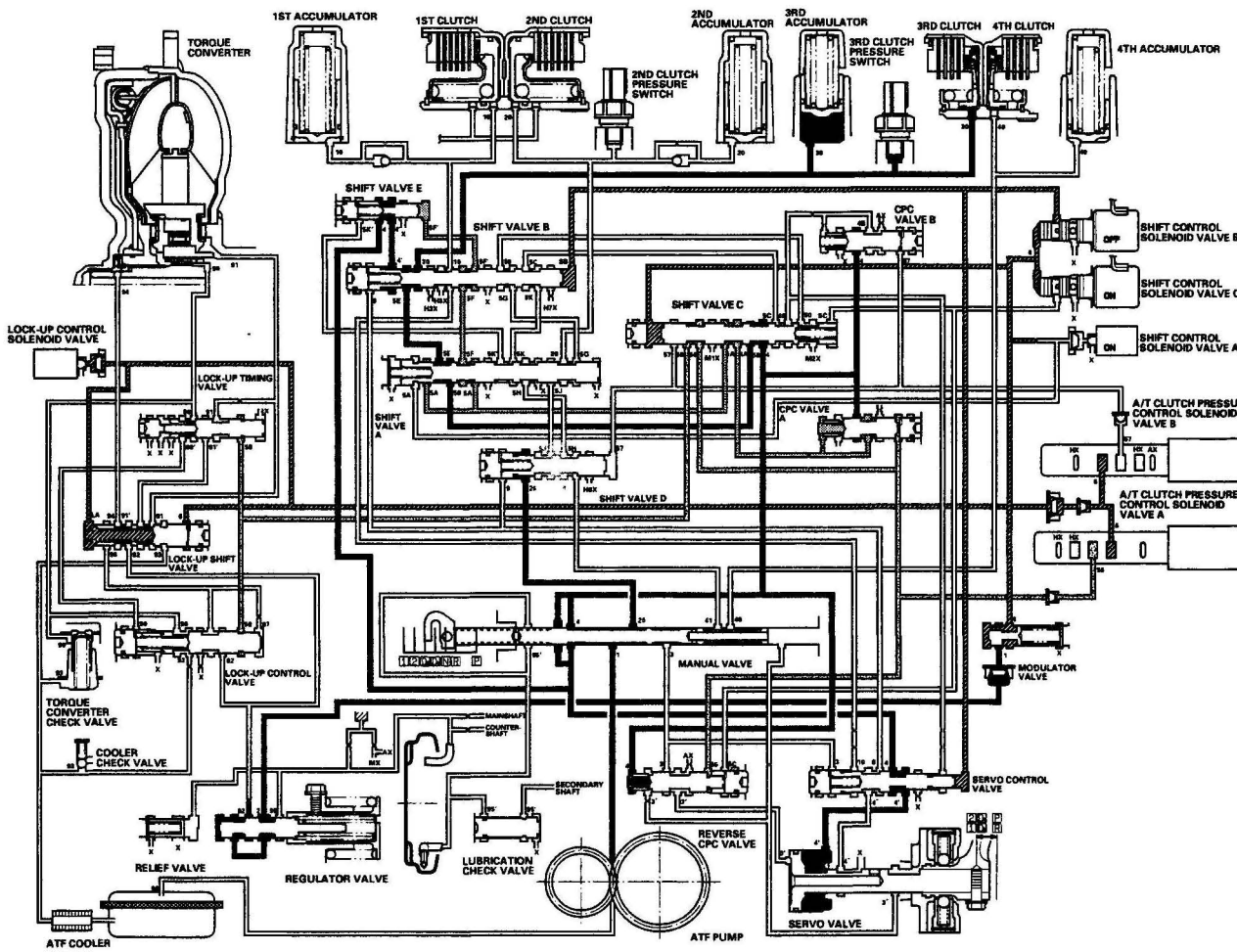
System Description (cont'd)

Hydraulic Flow (cont'd)

D4 Position: Driving in 3rd gear

The PCM turns the shift control solenoid valve C ON, and controls A/T clutch pressure control solenoid valve B to release LS B pressure (57). Shift control solenoid valve A remains ON, and B remains OFF. Releasing LS B pressure in the CPC valve B releases CPC B pressure in the 2nd clutch pressure circuit. Shift control solenoid valve C is turned ON, and SH C pressure (SC) in the right side of shift valve C is released. Then shift valve C is moved to the right side to switch the port line pressure and CPC pressure. The 3rd clutch pressure is changed to line pressure mode, and the 3rd clutch is engaged securely. The CPC A pressure (4A) stops at shift valve E.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



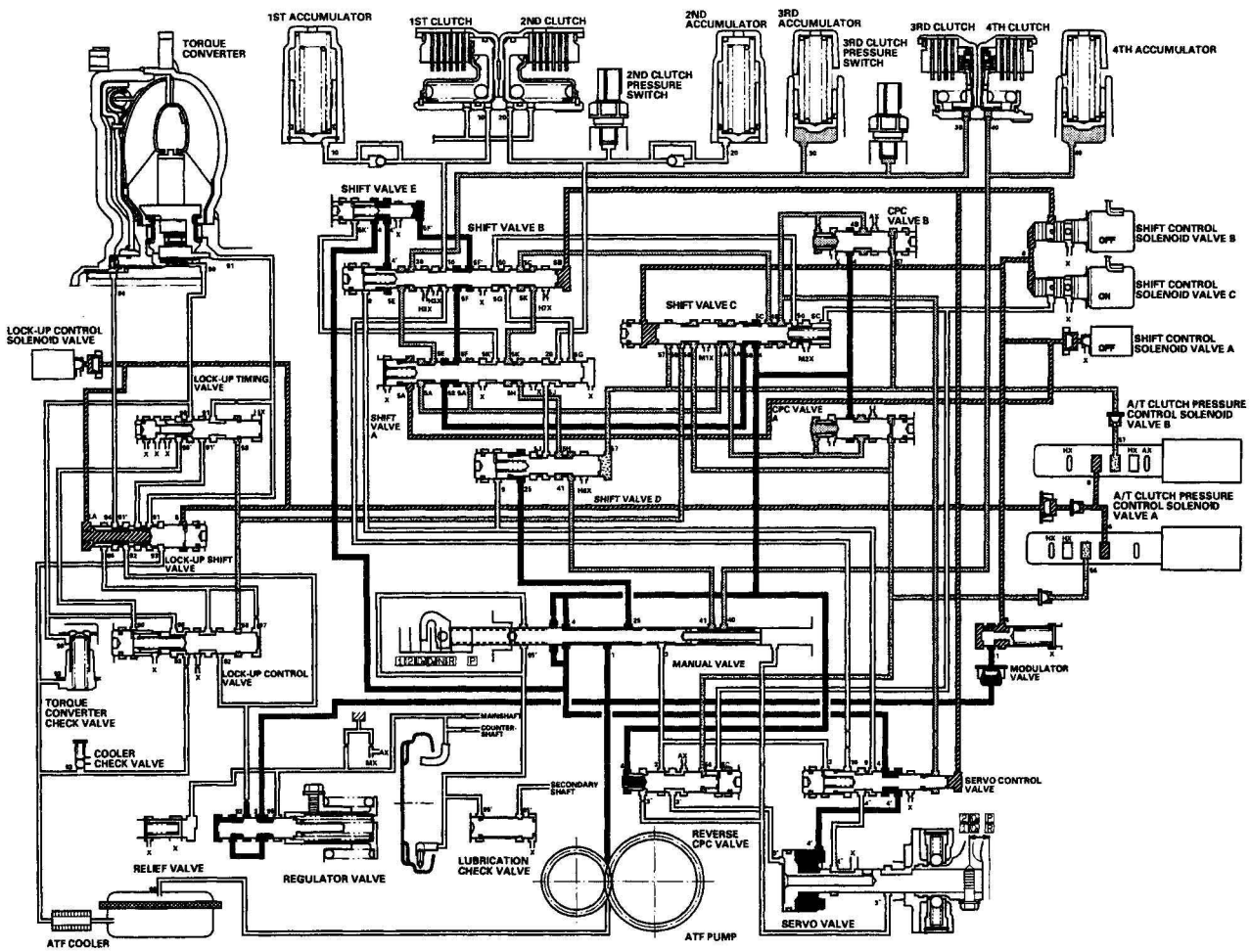
BACK

Protected by AR

D4 Position: Shifting between 3rd gear and 4th gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift control solenoid valve A OFF. The PCM also controls A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B. Shift control solenoid valve B remains OFF, and C remains ON. Shift control solenoid valve A is turned OFF, and SH A pressure (SA) is applied to the left side of shift valve A. Then shift valve A is moved to the left side to switch line pressure and CPC pressure. Line pressure (4) becomes CPC B pressure (4B) at CPC valve B. The CPC B pressure (4B) becomes 4th clutch pressure (41) at shift valve D, and flows to the 4th clutch via the manual valve. The 3rd clutch pressure is changed to CPC pressure mode by switching the position of shift valve A.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

System Description (cont'd)

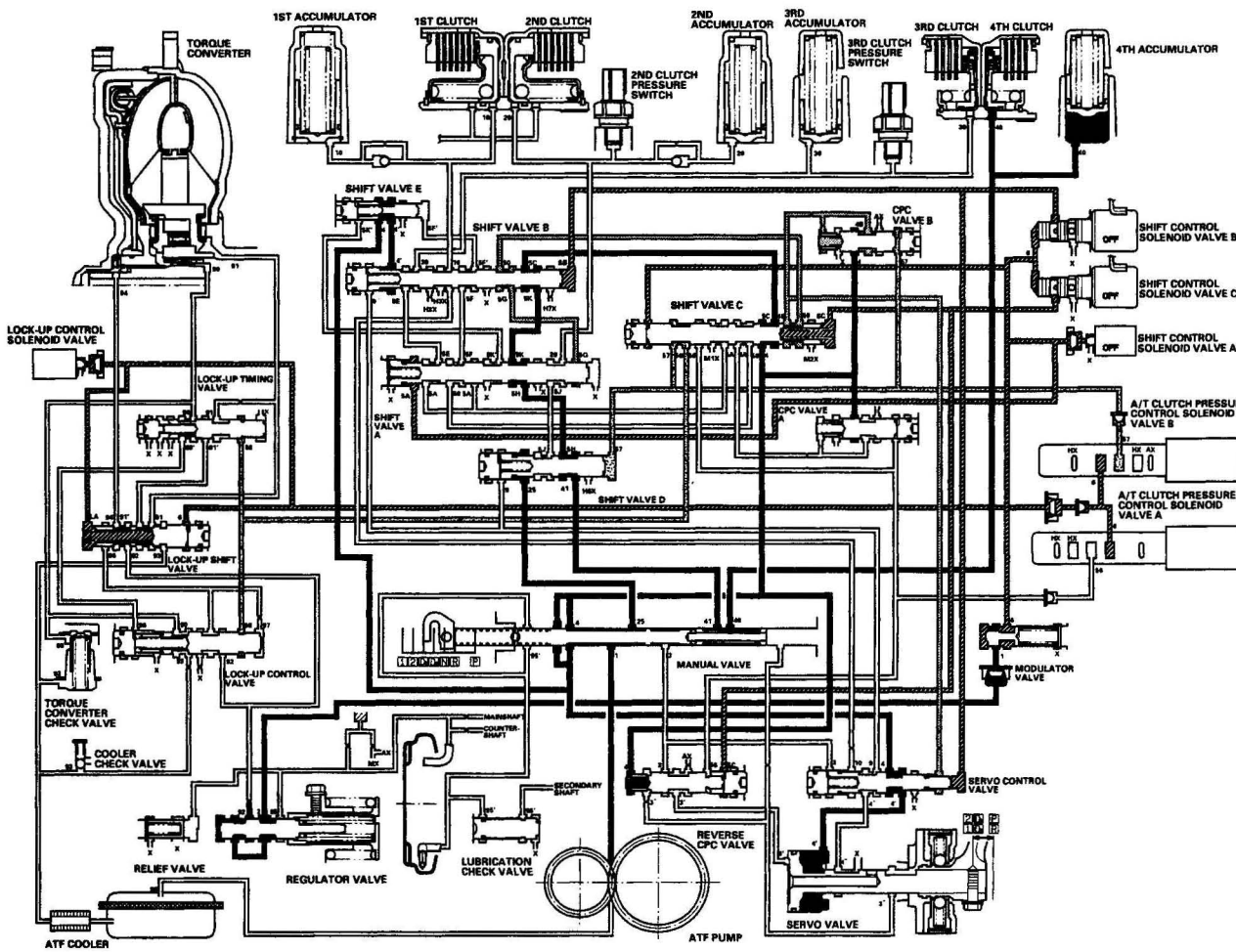
Hydraulic Flow (cont'd)

D4 Position: Driving in 4th gear

The PCM turns shift control solenoid valve C OFF, and controls A/T clutch pressure control solenoid valve A to release LS A pressure (56). Shift control solenoid valves A and B remain OFF. Releasing LS A pressure (56) releases CPC A pressure in the 3rd clutch pressure circuit. Shift control solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of shift valve C. Then shift valve C is moved to the left side to switch the port of line pressure and CPC pressure.

The CPC B pressure (5B) changes to line pressure (5B) at shift valve C, and flows to the 4th clutch via shift valve B, shift valve C, shift valve D, and the manual valve. The 4th clutch pressure is changed to line pressure mode by switching the position of shift valve C, and 4th clutch is engaged securely. The CPC B pressure (5D) stops at shift valve A.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



BACK

Protected by AR

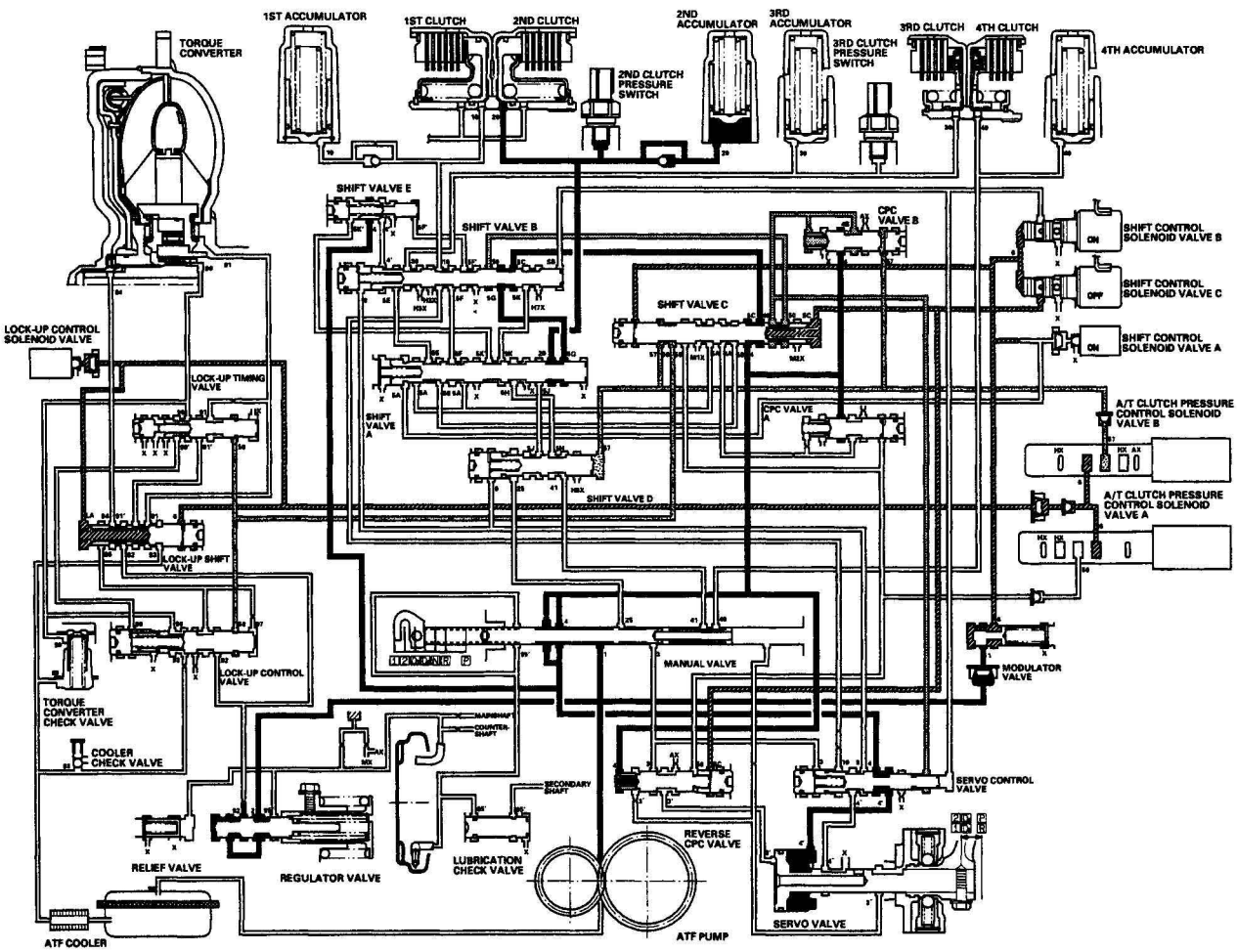
2 Position

The PCM controls the shift control solenoid valves and the A/T clutch pressure control solenoid valves. The conditions of the shift control solenoid valves and the positions of the shift valve are as follows:

- Shift control solenoid valve A is turned ON, and the shift valve A is in the right side.
- Shift control solenoid valve B is turned ON, and the shift valve B is in the right side.
- Shift control solenoid valve C is turned OFF, and the shift valve C is moved to the left side.

The PCM also controls A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B. Line pressure (4) from the manual valve becomes line pressure (5C) at shift valve C. Line pressure (5C) flows to shift valve A via shift valve B, and becomes 2nd clutch pressure (20). The 2nd clutch pressure is applied to the 2nd clutch, and 2nd clutch is engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

System Description (cont'd)

Hydraulic Flow (cont'd)

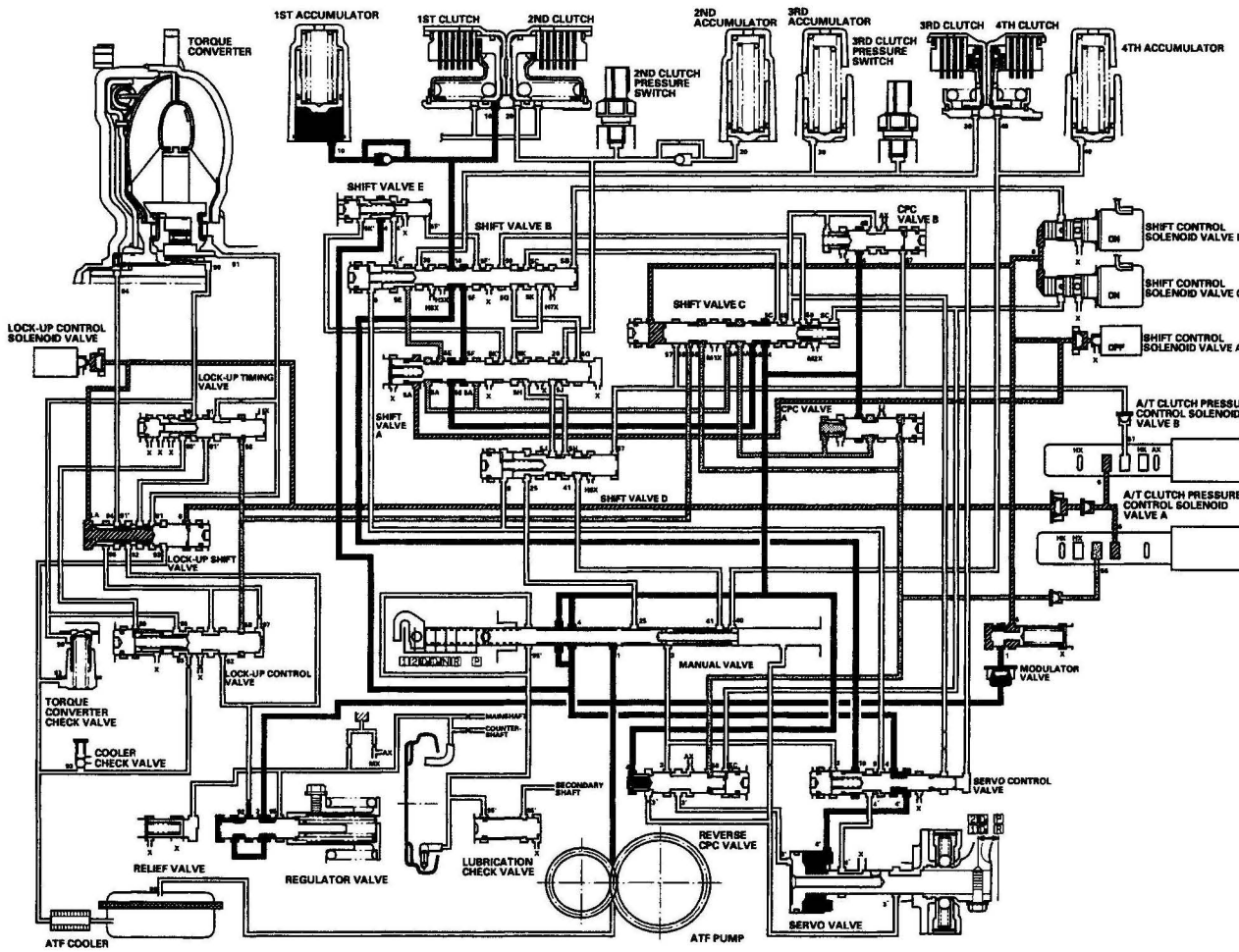
[1] Position

The PCM controls the shift control solenoid valves and the A/T clutch pressure control solenoid valves. The conditions of the shift control solenoid valves and the positions of the shift valve are as follows:

- Shift control solenoid valve A is turned OFF, and the shift valve A is moved to the left side.
- Shift control solenoid valve B is turned ON, and the shift valve B is in the right side.
- Shift control solenoid valve C is turned ON, and the shift valve C is in the right side.

Line pressure (4) becomes line pressure (5B) at shift valve C. Line pressure (5C) flows to shift valve B via shift valve A, and becomes 1st clutch pressure (10). 1st clutch pressure (10) is applied to the 1st clutch, then 1st clutch is engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



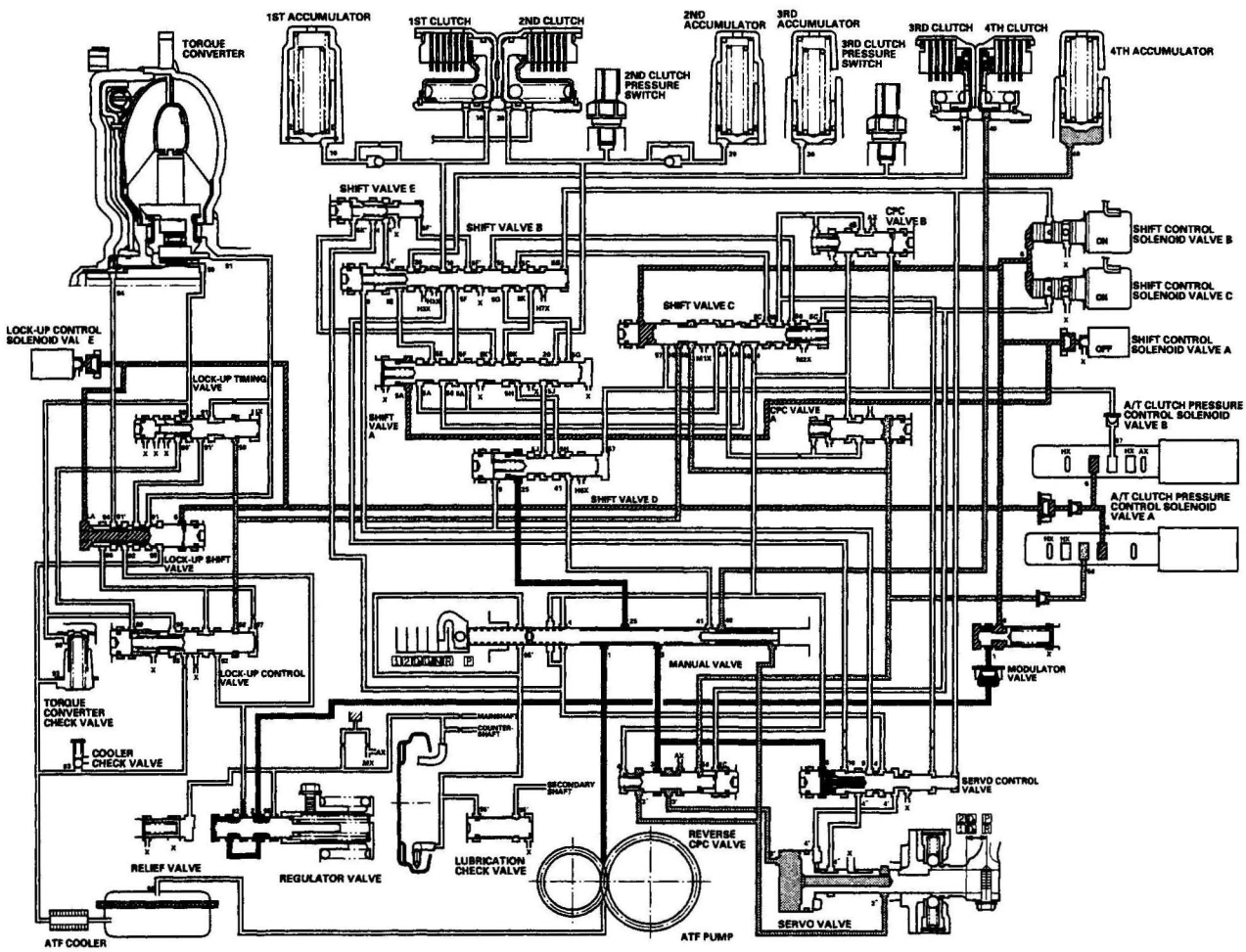
BACK

Protected by AR

[R] Position: Shifting to [R] position from [P] or [N] position

Line pressure (1) becomes line pressure (3) at the manual valve, and flows to the reverse CPC valve. Line pressure (3) is regulated by the reverse CPC valve and becomes line pressure (3'). Line pressure (3') pushes the servo valve to the reverse position, passes through the servo valve, and flows to the manual valve. Line pressure (3') becomes 4th clutch pressure (40). The 4th clutch pressure (40) is applied to the 4th clutch, and 4th clutch is engaged with the reverse CPC pressure mode.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Protected by AR

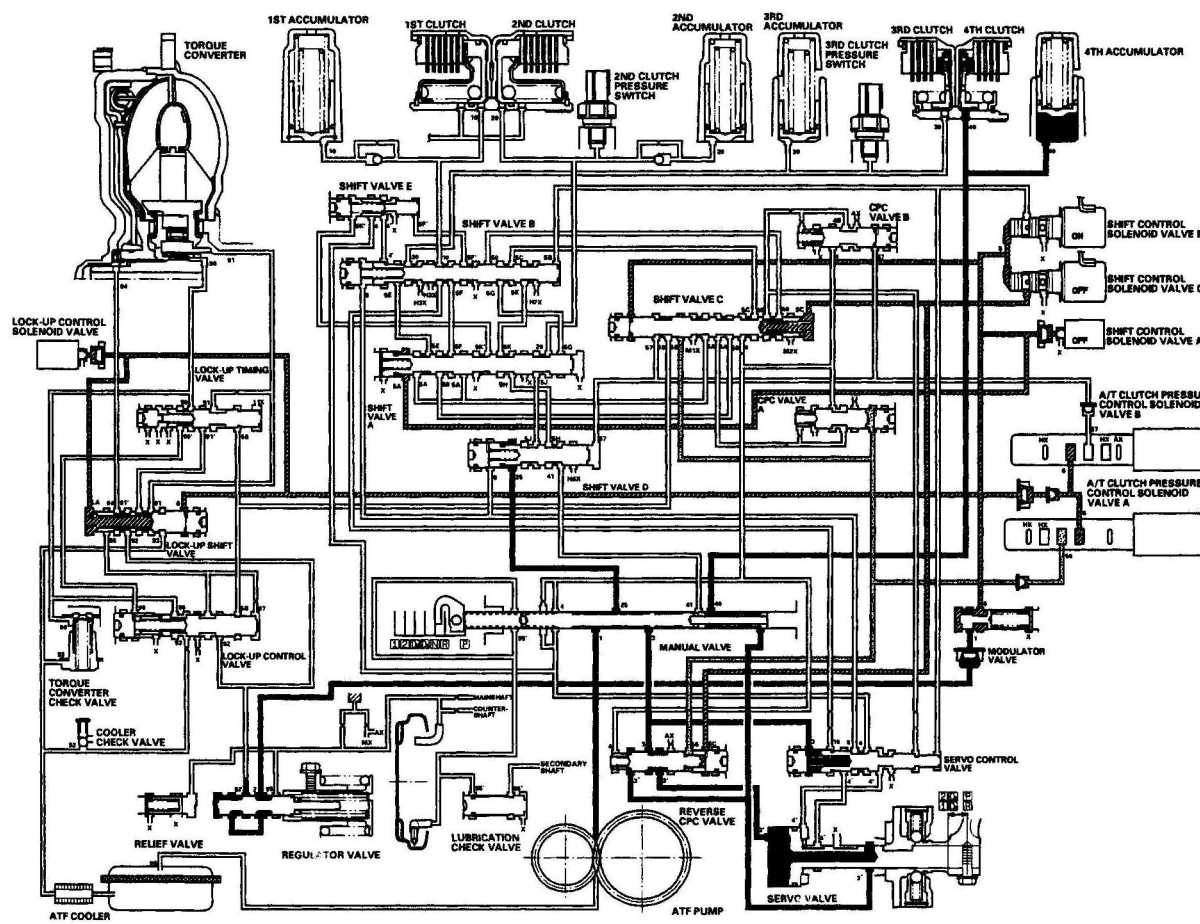
System Description (cont'd)

Hydraulic Flow (cont'd)

[R] Position: Driving in reverse gear
The PCM turns shift control solenoid valve C OFF. Shift control solenoid valve A remains OFF, and B remains ON. Shift control solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of the reverse CPC valve. Then the reverse CPC valve moves to the left side, creating full line pressure. Line pressure to the 4th clutch is same as in shifting to [R] position, and 4th clutch pressure increases. The 4th clutch is engaged with line pressure mode.

Reverse Inhibitor Control
When the [R] position is selected while the vehicle is moving forward at speed over 6 mph (10 km/h), the PCM outputs the 1st speed signal to turn the shift control solenoid valve C ON; shift control solenoid valve A remains OFF, and shift control solenoid valve B remains ON. The reverse CPC valve is moved to right side and covers the port to stop the line pressure (3') to the servo valve. The line pressure (3') is not applied to the servo valve, and the 4th clutch pressure (40) is not applied to the 4th clutch. As a result, power is not transmitted to the reverse position.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



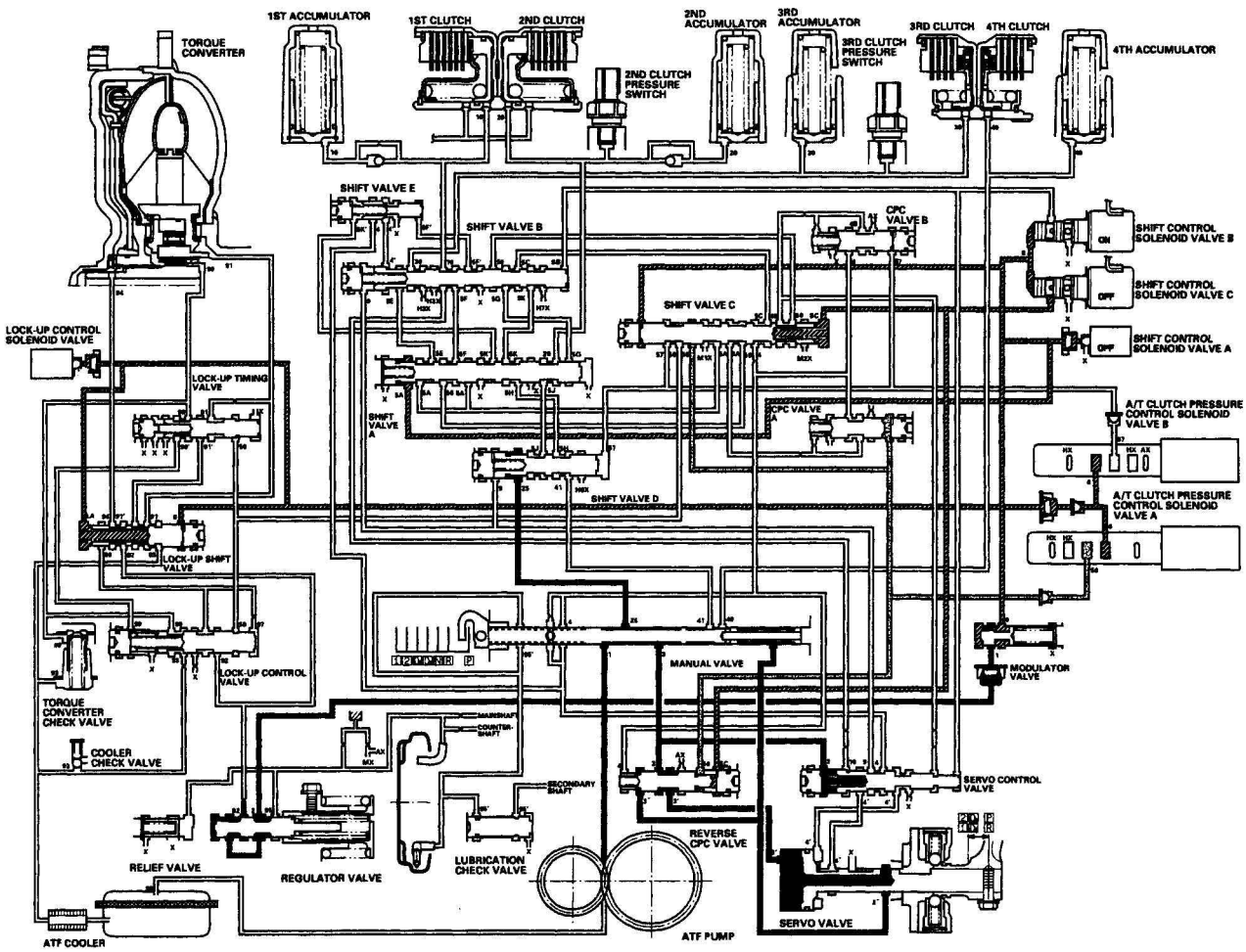
BACK

Protected by AR

[P] Position

Shift control solenoid valve C is turned OFF by the PCM, and SH C pressure (SC) is applied to the right side of the reverse CPC valve. Then the reverse CPC valve is moved to the left side to uncover the port leading line pressure (3) to the servo valve. Line pressure (3') passes through the servo valve and flows to the manual valve. Line pressure (3') is intercepted at the manual valve, and is not applied to the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

System Description (cont'd)

Lock-up System

In the D4 position (3rd and 4th), and D3 position (3rd), pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up piston to be held against the torque converter cover, As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, the PCM optimizes the timing of the lock-up mechanism. When the lock-up control solenoid valve activates, modulator pressure changes to switch lock-up ON and OFF. The lock-up control valve and the lock-up timing valve control the range of lock-up according to A/T clutch pressure control solenoid valves A and B. The lock-up control solenoid valve is mounted on the torque converter housing, and A/T clutch pressure control solenoid valves A and B are mounted on the transmission housing. They are controlled by the PCM.

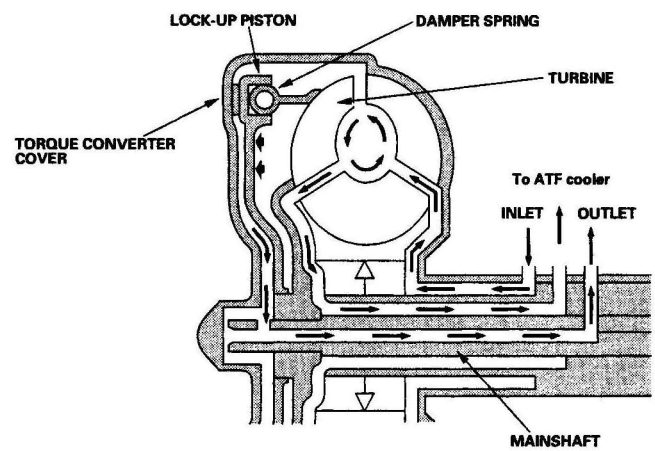
General Operation

1. Operation (clutch on)
   With the lock-up clutch on, fluid in the chamber between the torque converter cover and the lock-up piston is drained off, and the converter fluid exerts pressure through the piston against the torque converter cover. As a result, the converter turbine is locked to the converter cover. The effect is to bypass the converter, placing the vehicle in direct drive.

Power flow

The power flows by way of:

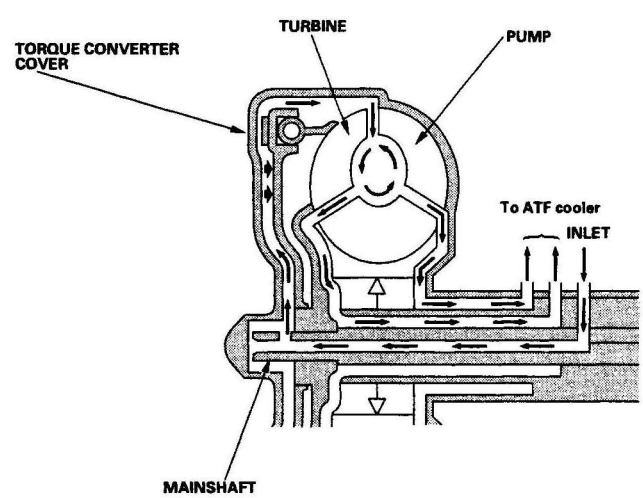
Engine
↓
Drive plate
↓
Torque converter cover
↓
Lock-up piston
↓
Damper spring
↓
Turbine
↓
Mainshaft



2. Operation (clutch off)
   With the lock-up clutch off, fluid flows in the reverse of CLUTCH ON. As a result, the lock-up piston moves away from the converter cover, and torque converter lock-up is released.

Power flow

Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft



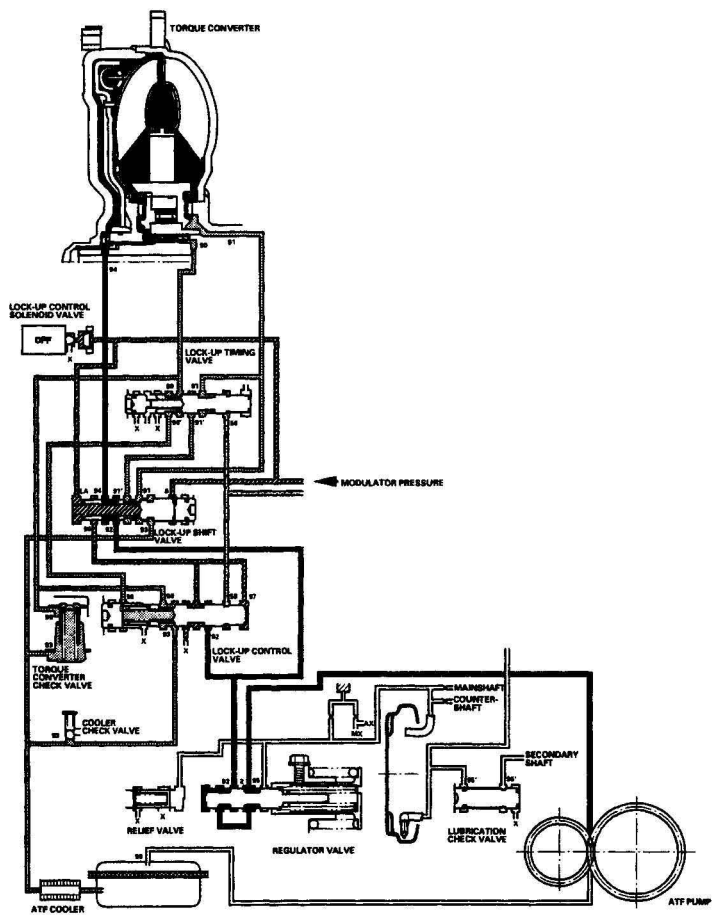
BACK

Protected by AR

No Lock-up

The lock-up control solenoid valve is turned OFF by the PCM. The lock-up shift valve receives LC pressure (LA) on the left side, and modulator pressure (6) on the right side. The lock-up shift valve is in the right side to uncover the port leading torque converter pressure (92) to the left side of the torque converter. Torque converter pressure (92) becomes torque converter pressure (94), and enters into the left side of the torque converter to disengage the lock-up clutch. The lock-up clutch is OFF.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Protected by AR

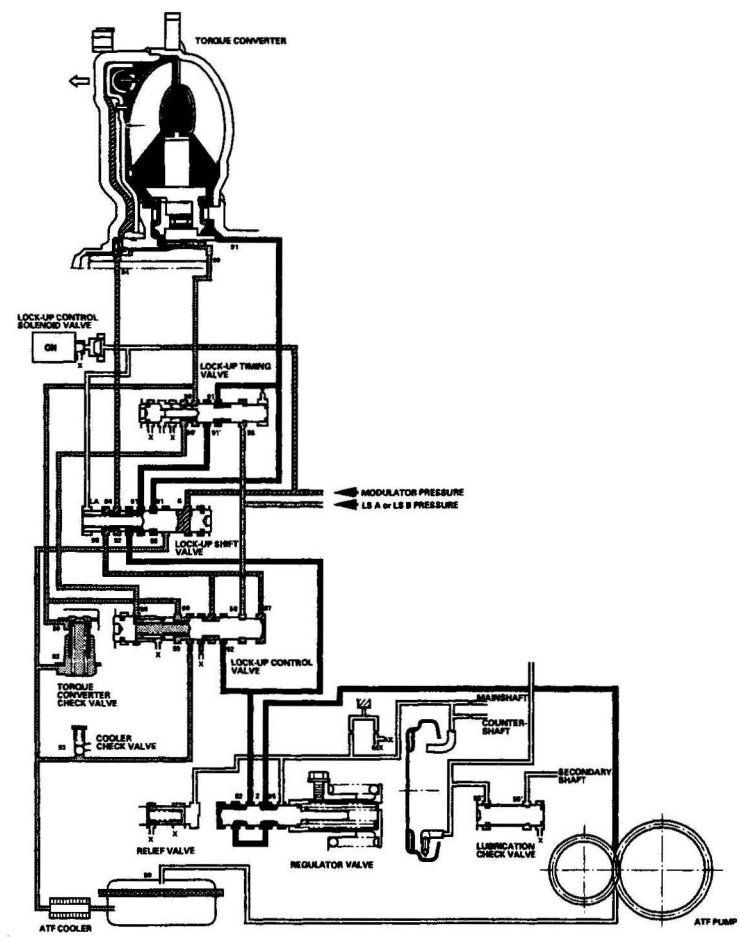
System Description (cont'd)

Lock-up System (cont'd)

Partial Lock-up

As the speed of the vehicle reaches the prescribed value, the lock-up control solenoid valve is turned ON by the PCM to release LC pressure (LA) in the left side of the lock-up shift valve. The lock-up shift valve is moved to the left side to switch the port leading torque converter pressure to the left side and right side of the torque converter. Torque converter pressure (92) flows to the right side of the torque converter to engage the lock-up clutch. The PCM also controls A/T clutch pressure control solenoid valves A and B, and LS A or LS B pressure is applied to the lock-up control valve and the lock-up timing valve. The position of the lock-up control valve depends on torque converter pressure and LS A or LS B pressure. When LS A or LS B pressure (58) is lower, torque converter pressure (92) from the regulator valve passes through the lock-up control valve, and flows to the left side of the torque converter to disengage the lock-up clutch. LS A and LS B pressure increase, and higher pressure is applied to the lock-up control valve to release torque converter back pressure. Torque converter back pressure goes lower, and this allows a greater amount of pressure to work on the lock-up clutch to engage the lock-up clutch. Under this condition, the lock-up clutch is controlled by pressure from the right side (to engage the lock-up clutch) and the left side (to disengage the lock-up clutch); the lock-up clutch is in partial lock-up condition.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



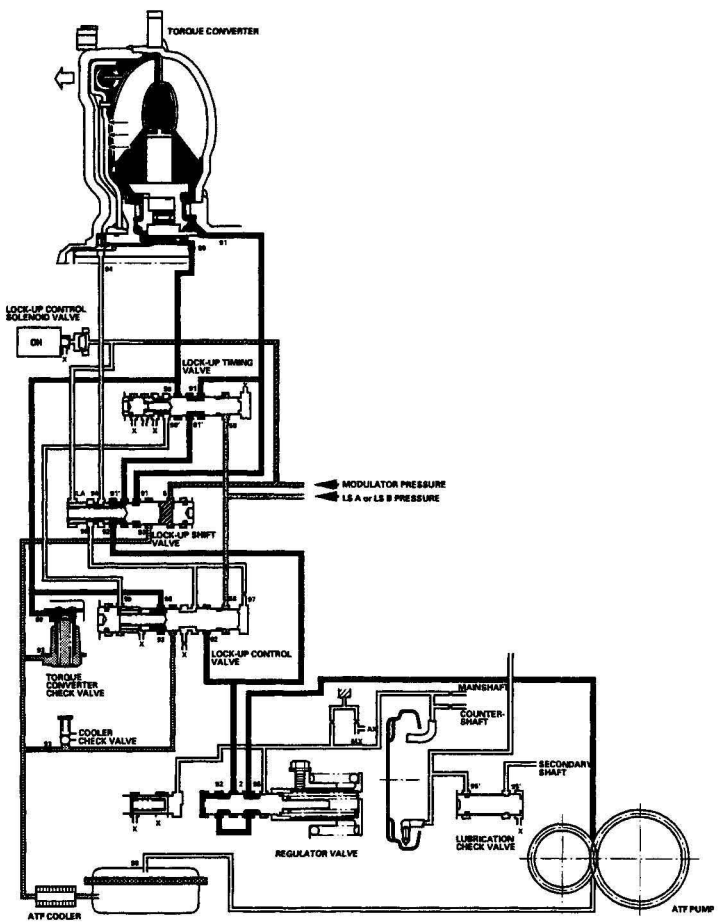
BACK

Protected by AR

Full Lock-up

When the vehicle speed further increases, the PCM controls A/T clutch pressure control solenoid valves A and B to increase LS A or LS B pressure (58). The LS A or LS B pressure (58) is applied to the lock-up control valve and the lock-up timing valve, and moves them to the left side. Under this condition, torque converter back pressure (F2) is released fully, causing the lock-up clutch to be fully engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

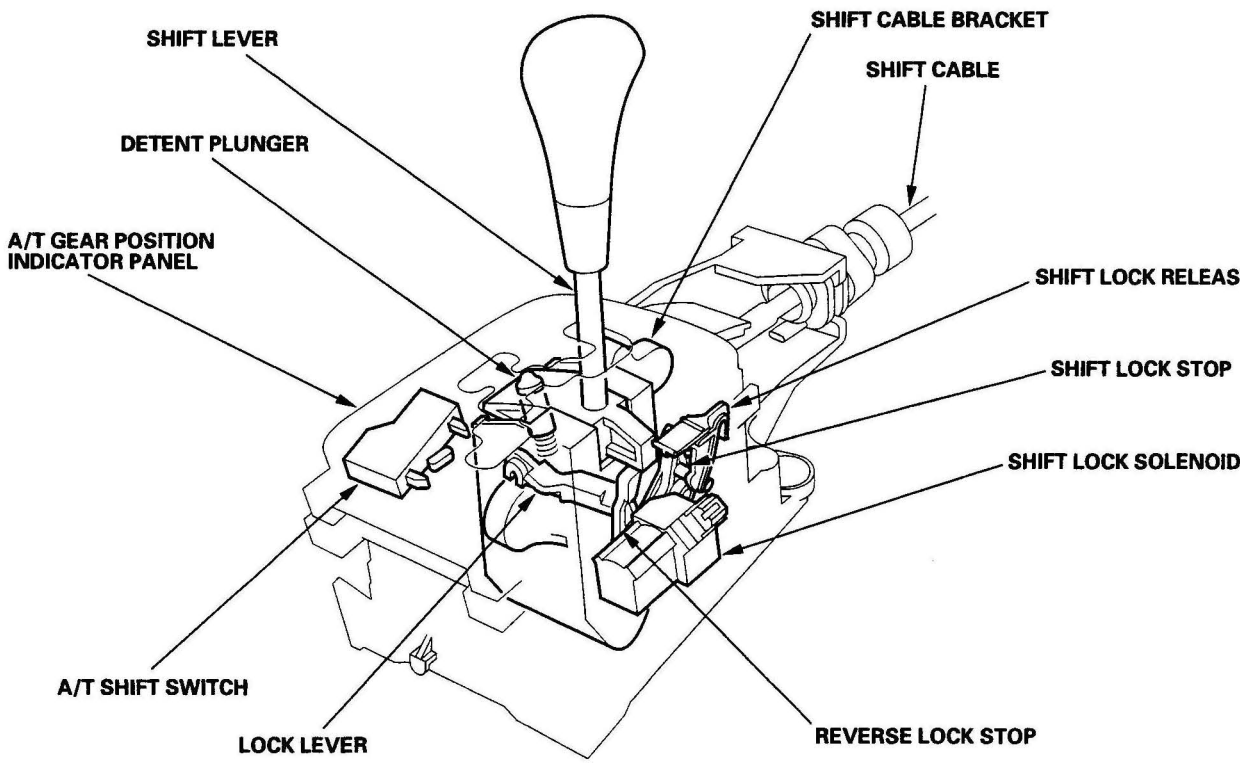
System Description (cont'd)

Shift Lever/Sequential Sportshift Mode Mechanism

The shift lever has eight position: P, R, N, D4, D3, 2, 1 positions, and the sequential sportshift mode position. The shift lever shifts between positions along the gate in the A/T gear position indicator panel. The shift lever can shift out of the P position and into the R position without depressing the shift lever. The shift lock/reverse lock mechanism is an additional shift lever lockout mechanism.

The shift lever is engaged with the shift cable bracket in P, R, N, D4, D3, 2, and 1. This unit shifts the transmission using the shift cable connected between the shift cable bracket and the transmission control shaft.

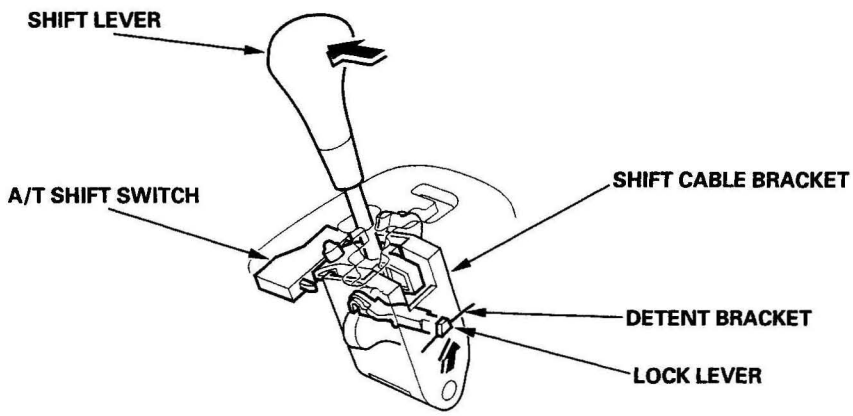
In the sequential sportshift mode position, the shift lever is disengaged from the cable bracket, and the shift lever can be used to shift gears electronically between 1st through 4th, much like a manual transmission.



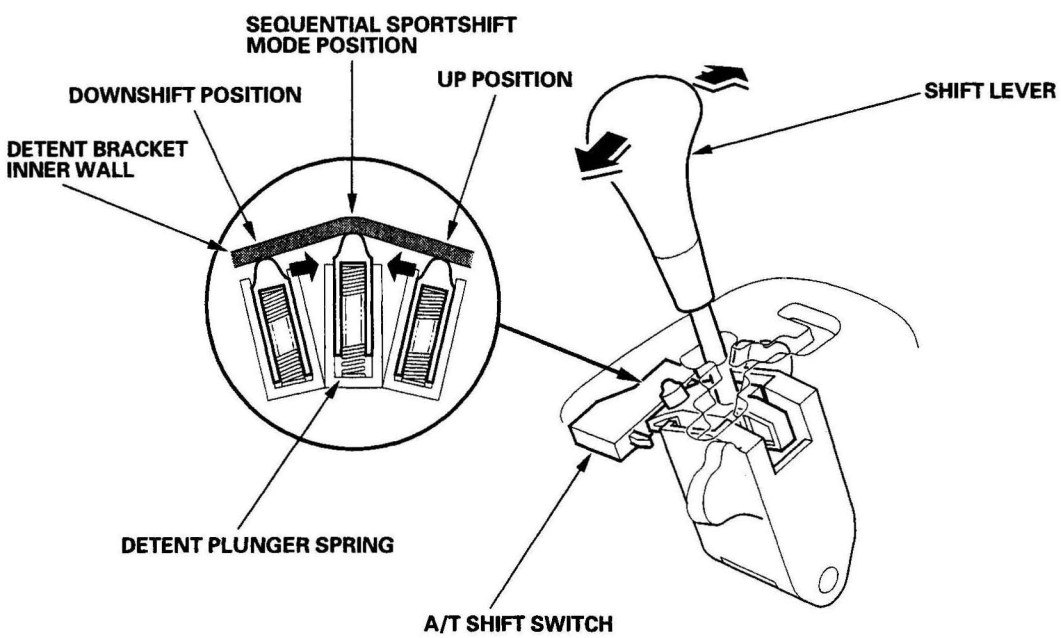
BACK

Protected by AR

When the shift lever shifts to the sequential sportshift mode position, the shift lever releases the lock lever, and the lock lever pops up to engage the shift cable bracket to the detent bracket; the shift cable bracket and the shifting positions in the transmission are held in the D4 position.
The lock lever receives its spring load, pops up in the sequential sportshift mode position, and is depressed by the shift lever and does not engage the shift cable bracket to the shift lever base bracket in any position except sequential sportshift mode.



The shift lever fits into the sequential sportshift mode position by using a detent plunger with a spring. When shifting up or down, the detent plunger is depressed by the detent bracket inner wall, and the detent plunger spring puts the shift lever back into the neutral position. The detent plunger also works in the P position.



(cont'd)

BACK

Protected by AR

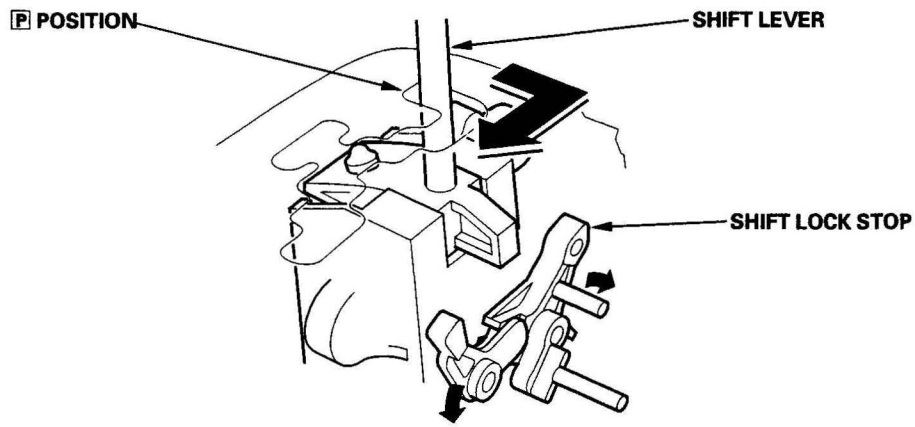
System Description (cont'd)

Shift Lock/Reverse Lock Mechanism

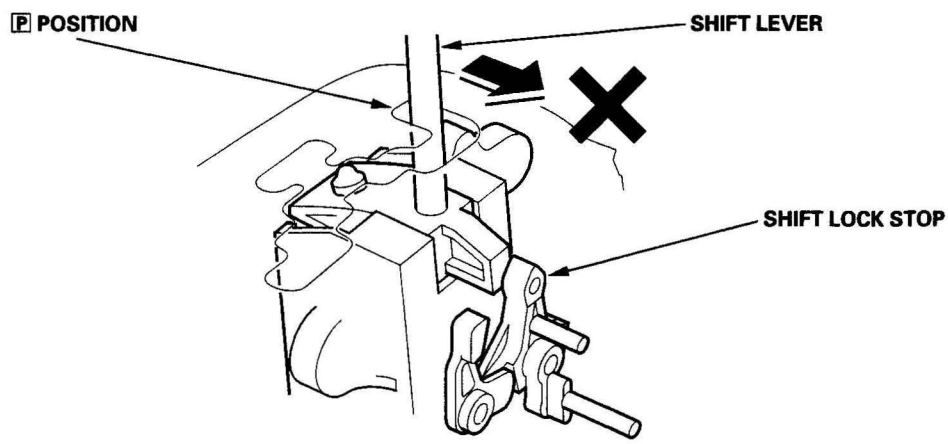
The shift lock system reduces the risk of unintentional engine starting. Starting the engine is possible only in the P and N positions. The shift lock system and the key interlock system make up the interlock control system. The key interlock mechanism is located in the steering lock assembly.

The shift lock mechanism consists of the shift lock solenoid, shift lock stop, shift lock release, and related parts. The reverse lock mechanism shares the shift lock solenoid with the shift lock mechanism, and the reverse lock stop and the shift lock stop are interlocked with the shift lock solenoid operation. The shift lock solenoid is electronically controlled by these shift lock control system signals: brake signal, interlock control signal, and A/T gear position switch P position signal. If the shift lock solenoid does not operate, the shift lock/reverse lock mechanism can be released by depressing the shift lock release.

In the P position while depressing the brake pedal, the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the shift lock stop. This allows the shift lever to be moved.



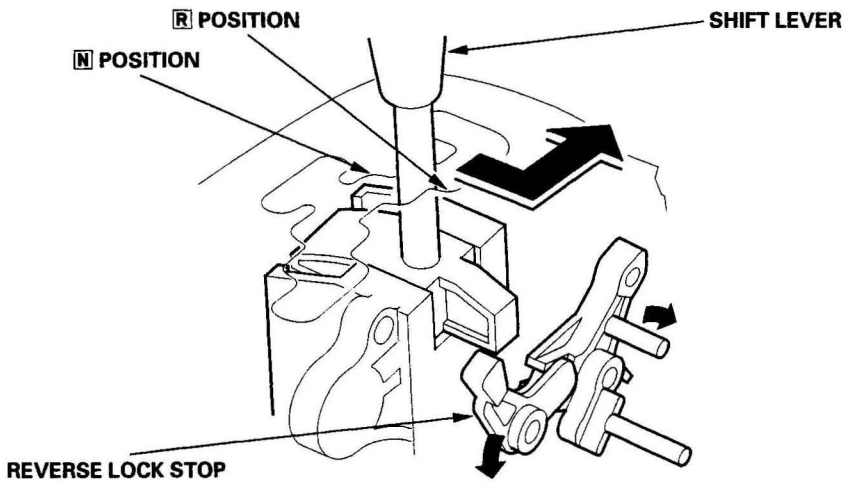
When the brake pedal is released, the shift lock solenoid remains OFF, and the shift lock stop locks to block the shift lever in the P position.



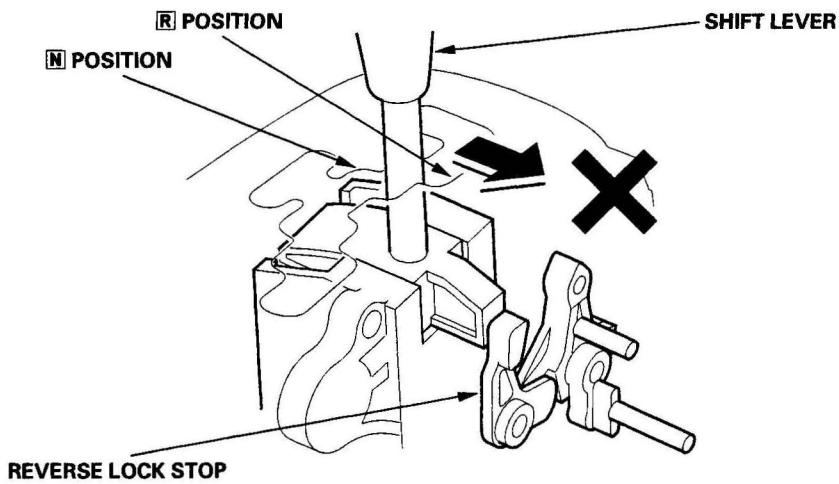
BACK

Protected by AR

When the shift lever is shifted to the R position from the D4 position and the N position (under certain conditions), the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the reverse lock stop. This allows the shift lever to be moved to the R position.



If the allowable conditions of turning ON the solenoid are not met, the shift lock solenoid remains OFF, and the reverse lock stop locks to block the shift lever in the N position.

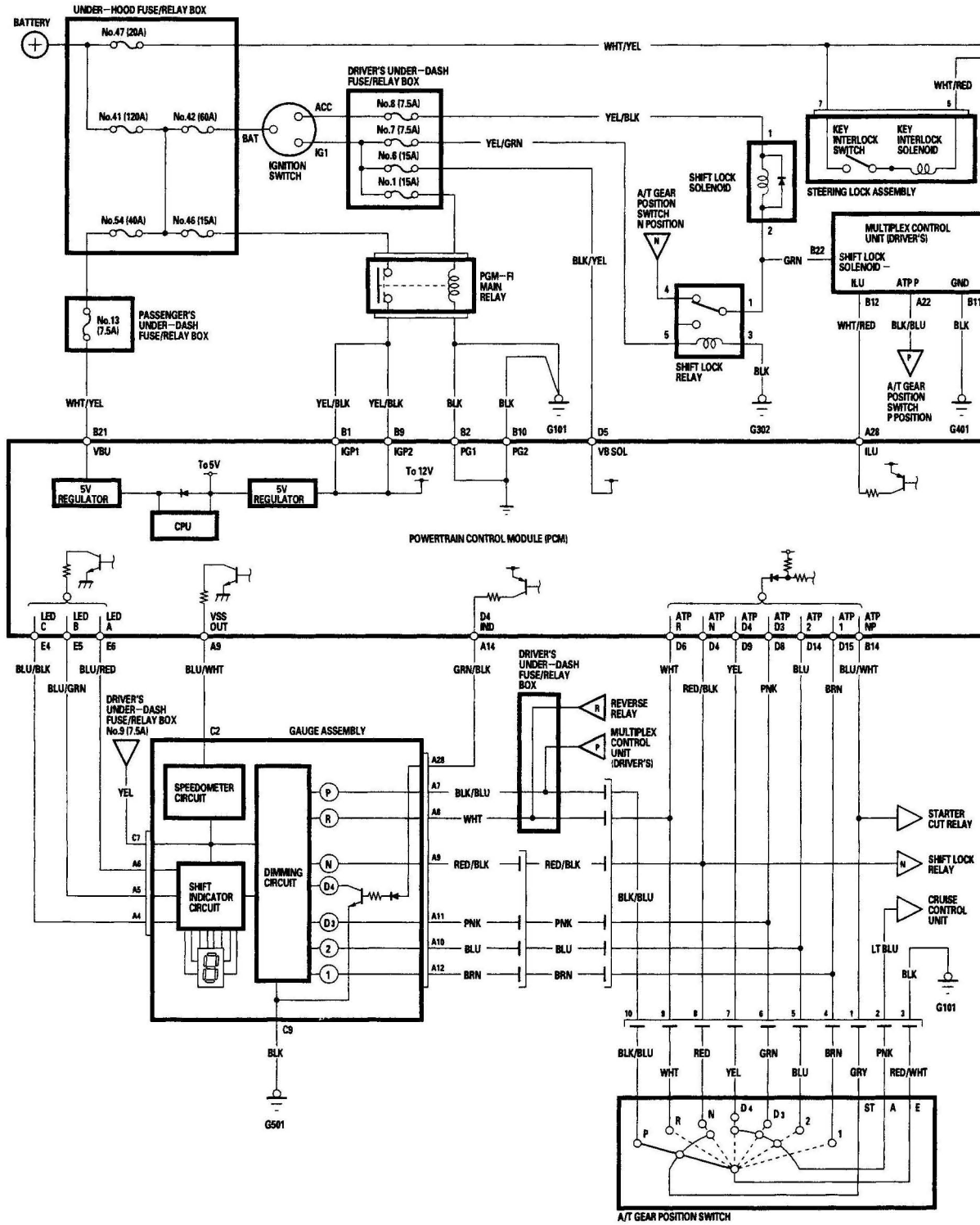


(cont'd)

Protected by AR

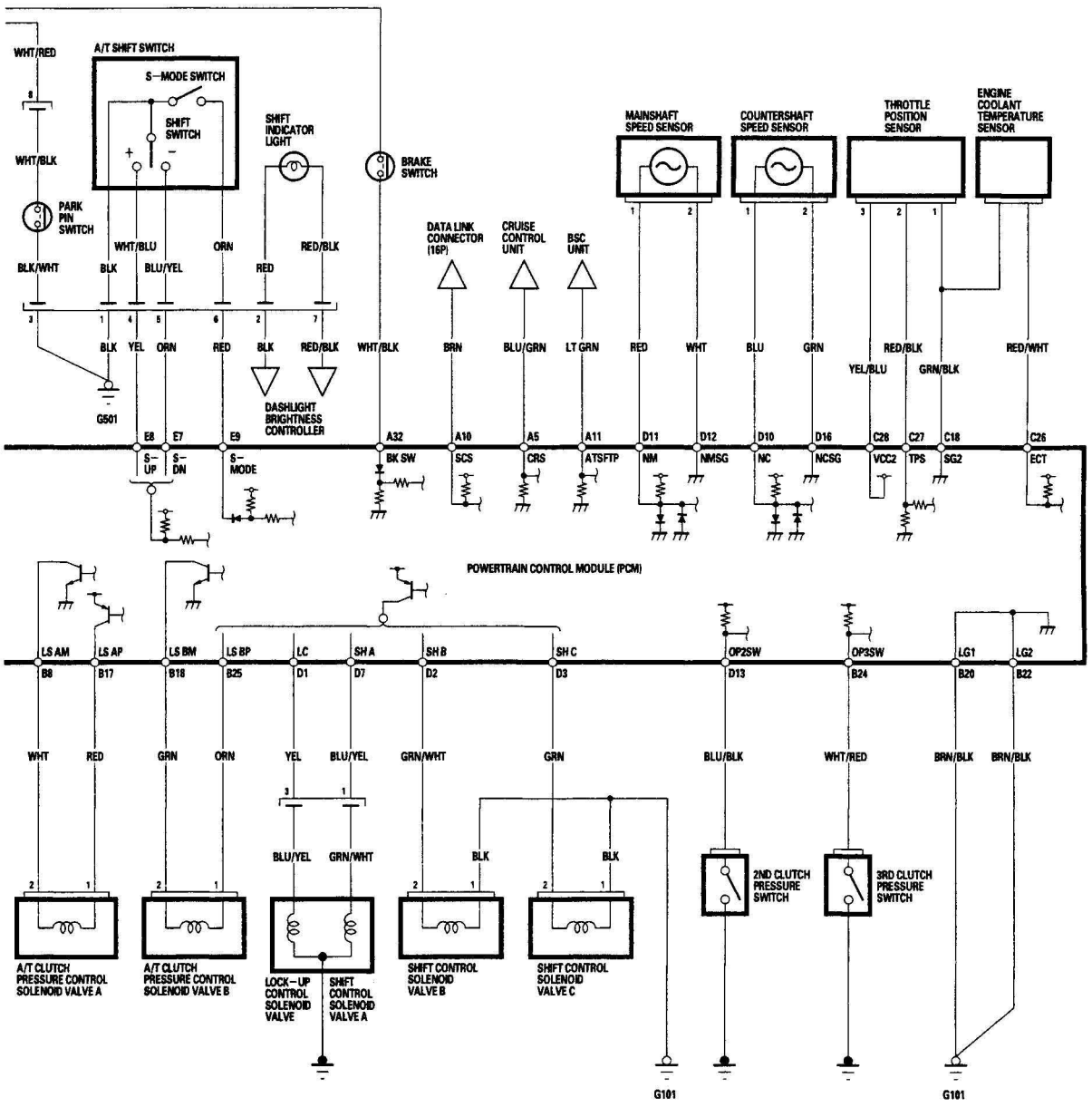
System Description (cont'd)

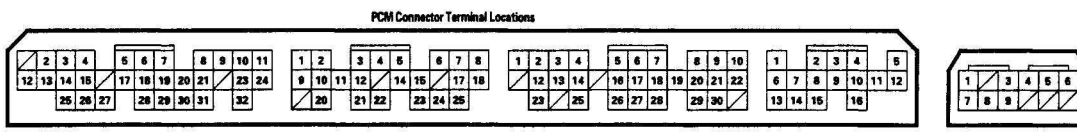
Circuit Diagram



BACK

Protected by AR





BACK

Protected by AR

DTC Troubleshooting

DTC P0715: Problem in Mainshaft Speed Sensor Circuit

NOTE: Record all freeze data before you troubleshoot.

Code P0715 (15) on the PCM doesn't always mean there's an electrical problem in the mainshaft or countershaft speed sensor circuit; code P0715 (15) may also indicate a mechanical problem in the transmission. Any problem causing irregular countershaft to mainshaft speed difference can cause this code.

1. Check the mainshaft and the countershaft speed sensor installation.

   Are the mainshaft and countershaft speed sensors installed properly?

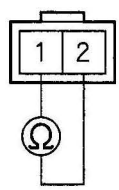
   YES – Go to step 2.

   NO – Reinstall and recheck. ■

2. Disconnect the 2P connector from the mainshaft speed sensor.

3. Measure mainshaft speed sensor resistance at the sensor connector.

   MAINSHAFT SPEED SENSOR CONNECTOR



Terminal side of male terminals

   Is the resistance 400 – 600 Ω ?

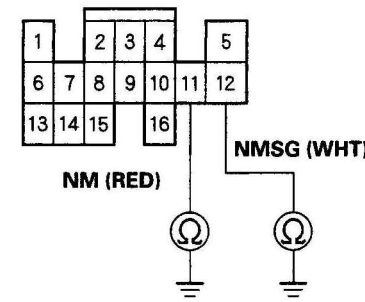
   YES – Go to step 4.

   NO – Replace the mainshaft speed sensor. ■

4. Disconnect the D (16P) connector from the PCM.

5. Check for continuity between body ground and PCM connector terminals D11 and D12 individually.

   PCM CONNECTOR D (16P)



Wire side of female terminals

   Is there continuity?

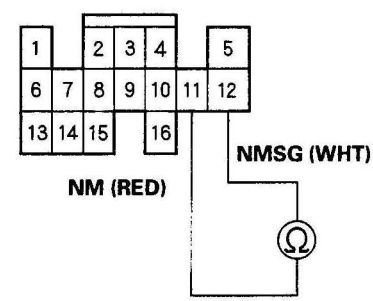
   YES – Repair short to ground in the wires between PCM connector terminals D11 and D12 and the mainshaft speed sensor. ■

   NO – Go to step 6.

6. Connect the mainshaft speed sensor connector.

7. Measure the resistance between PCM connector terminals D11 and D12.

   PCM CONNECTOR D (16P)



Wire side of female terminals

   Is the resistance 400 – 600 Ω ?

   YES – Run the Electrical Troubleshooting Flowchart for code P0720 (code 9). Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

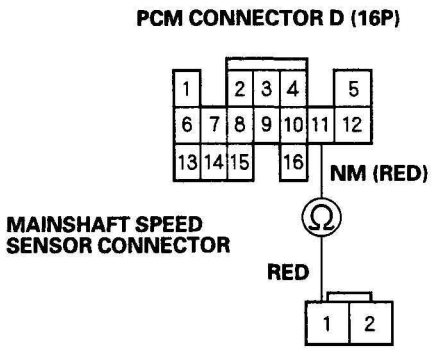
   NO – Go to step 8.

BACK

Protected by AR

8. Disconnect the 2P connector from the mainshaft speed sensor.

9. Check for continuity between PCM connector terminal D11 and the No.1 terminal of the mainshaft speed sensor connector.



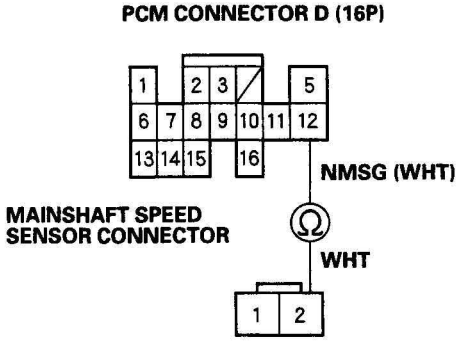
Wire side of female terminals

Is there continuity?

YES—Go to step 10.

NO—Repair open in the wire between PCM connector terminal D11 and the mainshaft speed sensor.■

10. Check for continuity between PCM connector terminal D12 and the No.2 terminal of the mainshaft speed sensor connector.



Wire side of female terminals

Is there continuity?

YES—Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

NO—Repair open in the wire between PCM connector terminal D12 and the mainshaft speed sensor.■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0720: Problem in Countershaft Speed Sensor Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Check the countershaft speed sensor installation.

   Is the countershaft speed sensor installed properly?

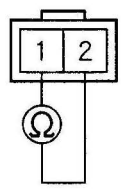
   YES – Go to step 2.

   NO – Reinstall and recheck. ■

2. Disconnect the 2P connector from the countershaft speed sensor.

3. Measure countershaft speed sensor resistance at the sensor connector.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Terminal side of male terminals

Is the resistance 400 – 600 Ω ?

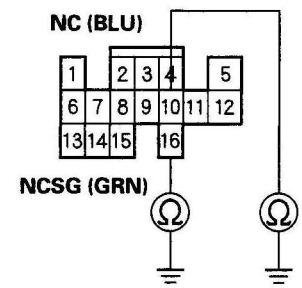
YES – Go to step 4.

NO – Replace the countershaft speed sensor. ■

4. Disconnect the D (16P) connector from the PCM.

5. Check for continuity between body ground and PCM connector terminals D10 and D16 individually.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is there continuity?

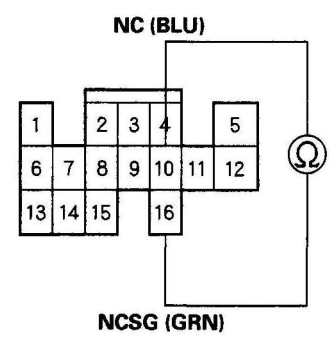
YES – Repair short to ground in the wires between PCM connector terminals D10 and D16 and the countershaft speed sensor. ■

NO – Go to step 6.

6. Connect the countershaft speed sensor connector.

7. Measure the resistance between PCM connector terminals D10 and D16.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is the resistance 400 – 600 Ω ?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Repair loose terminal or open in the wires between PCM connector terminals D10 and D16 and the countershaft speed sensor. ■

BACK

Protected by AR

DTC P0730: Problem in Shift Control System

NOTE:
- Record all freeze data beofore you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Lock-up control solenoid valve/shift control solenoid valve A assembly
  - Shift control solenoid valve B
  - Shift control solenoid valve C
  - A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES—Perform the Troubleshooting Flowchart for the indicated Code(s). Recheck for code P0730 after troubleshooting.■

   NO—Go to step 2.

   NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

2. Measure the 1st, 2nd, 3rd, and 4th clutch pressure (see page 14-100).

   Is each clutch pressure within the service limit?

   YES—Go to step 3.

   NO—Repair the hydraulic system as necessary.■

3. Replace the Solenoid Assembly set (lock-up control solenoid valve/shift control solenoid valve A assembly (see page 14-102), the shift control solenoid valves B and C (see page 14-103) and the A/T clutch pressure control solenoid valves A and B (see page 14-105)).

4. Turn the ignition switch OFF, and reset the PCM memory by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

5. Calibrate the engine idle control system in the PCM (see page 11-158), and drive the vehicle at a speed over 12 mph (20 km/h) in 1st, 2nd, 3rd, 4th gear in the D4 position for more than 30 seconds.

6. Recheck for code P0730.

   Does the OBD II scan tool indicate code P0730?

   YES—Replace the transmission.■

   NO—The system is OK at this time.■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0740: Problem in Lock-up Control System

NOTE:
- Record all freeze data before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Lock-up control solenoid valve/shift control solenoid valve A assembly
  - A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES – Perform the Troubleshooting Flowchart for the indicated Code(s). Recheck for code P0740 after troubleshooting. ■

   NO – Go to step 2.

   NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

2. Measure the line pressure (see page 14-100).

   Is the line pressure within the service limit?

   YES – Go to step 3.

   NO – Repair the hydraulic system as necessary. ■

3. Replace the Lock-up Control Solenoid Assembly set (lock-up control solenoid valve/shift control solenoid valve A assembly (see page 14-102) and the A/T clutch pressure control solenoid valves A and B (see page 14-105)).

4. Turn the ignition switch OFF, and reset the PCM memory by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

5. Using the scan tool, check to be sure that the engine coolant temperature is 176°F (80°C) or above.

6. Calibrate the engine idle control system in the PCM (see page 11-158), and drive the vehicle at 55 mph (88 km/h) for more than 1 minute.

7. Recheck for code P0740.

   Does the OBD II scan tool indicate code P0740?

   YES – Replace the transmission and torque converter. ■

   NO – The system is OK at this time. ■

BACK

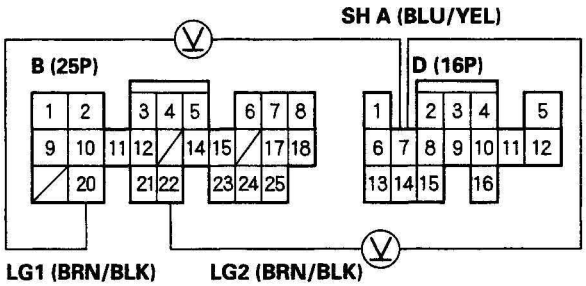
Protected by AR

DTC P0753: Problem in Shift Control Solenoid Valve A Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the B (25P) and D (16P) connectors from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between PCM connector terminals D7 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

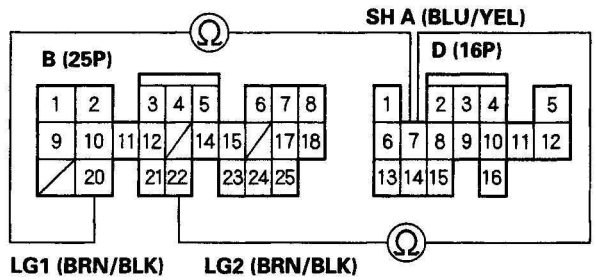
Is there voltage?

YES – Repair short to power in the wire between PCM connector terminal D7 and the shift control solenoid valve A. ■

NO – Go to step 5.

5. Turn the ignition switch OFF.
6. Measure the resistance between PCM connector terminals D7 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

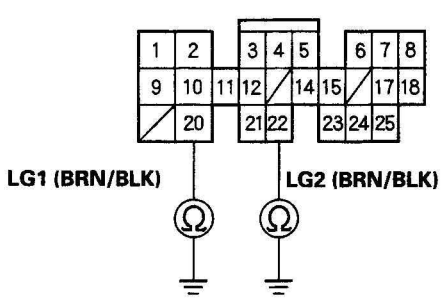
Is the resistance 12 – 25 Ω ?

YES – Go to step 11.

NO – Go to step 7.

7. Check for continuity between PCM connector terminal B20 and body ground, and between B22 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Go to step 8.

NO – Repair open in the wires between PCM connector terminals B20 and B22 and ground (G101). Repair poor ground (G101). ■

(cont'd)

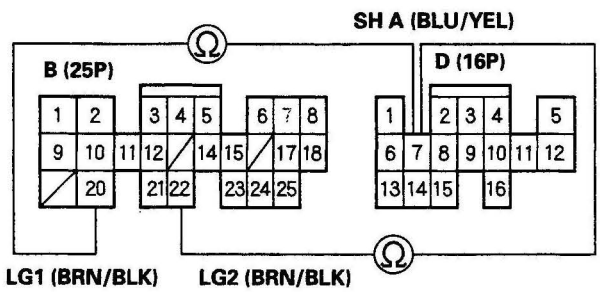
Protected by AR

DTC Troubleshooting (cont'd)

8. Disconnect the 3P connector from the lock-up control solenoid valve/shift control solenoid valve A assembly.

9. Check for continuity between PCM connector terminals D7 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

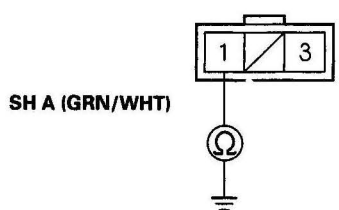
Is there continuity?

YES – Repair short to ground in the wire between the D7 terminal and shift control solenoid valve A. ■

NO – Go to step 10.

10. Measure the resistance between the No. 1 terminal of the lock-up control solenoid valve/shift control solenoid valve A assembly connector and body ground.

LOCK-UP CONTROL SOLENOID VALVE/ SHIFT CONTROL SOLENOID VALVE A ASSEMBLY CONNECTOR (3P)



Terminal side of male terminals

Is the resistance 12–25 Ω ?

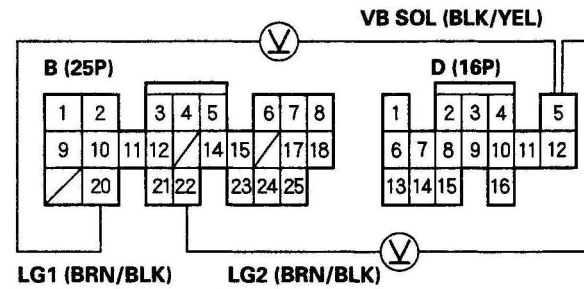
YES – Check for an open in the wire between PCM connector terminal D7 and shift control solenoid valve A. ■

NO – Replace the lock-up control solenoid valve/ shift control solenoid valve A assembly. ■

11. Turn the ignition switch ON (II).

12. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

BACK

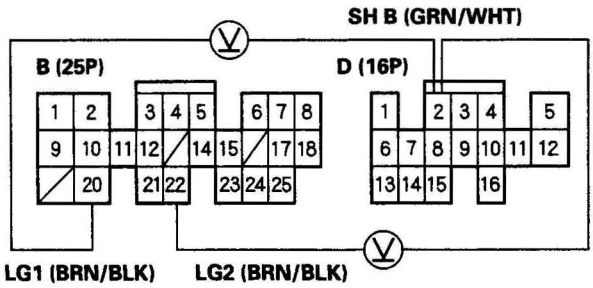
Protected by AR

DTC P0758: Problem in Shift Control Solenoid Valve B Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the B (25P) and D (16P) connectors from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between PCM connector terminals D2 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

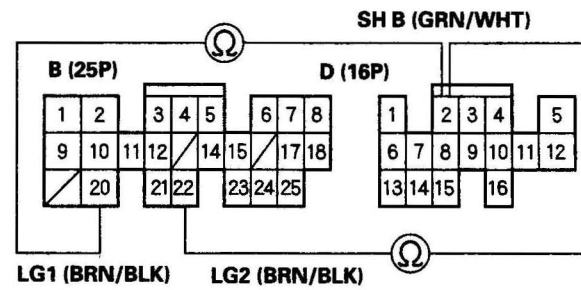
Is there voltage?

YES—Repair short to power in the wire between PCM connector terminal D2 and the shift control solenoid valve B.■

NO—Go to step 5.

5. Turn the ignition switch OFF.
6. Measure the resistance between PCM connector terminals D2 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

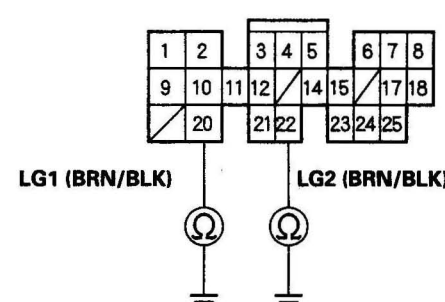
Is the resistance 12—25 Ω?

YES—Go to step 11.

NO—Go to step 7.

7. Check for continuity between PCM connector terminal B20 and body ground, and between B22 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES—Go to step 8.

NO—Repair open in the wires between PCM connector terminals B20 and B22 and ground (G101). Repair poor ground (G101).■

(cont'd)

BACK

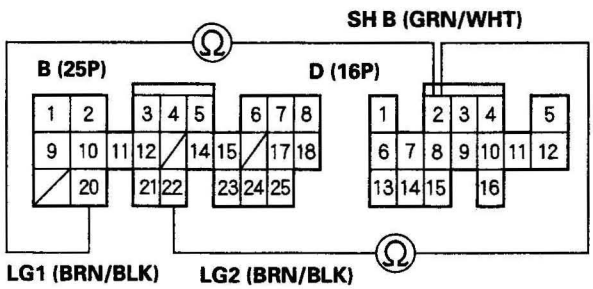
Protected by AR

DTC Troubleshooting (cont'd)

8. Disconnect the 2P connector from the shift control solenoid valve B.

9. Check for continuity between PCM connector terminals D2 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

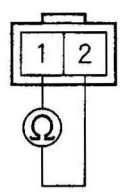
Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal D2 and the shift control solenoid valve B.■

NO—Go to step 10.

10. Measure shift control solenoid valve B resistance at the solenoid valve connector.

SHIFT CONTROL SOLENOID VALVE B CONNECTOR



Terminal side of male terminals

Is the resistance 12—25 Ω ?

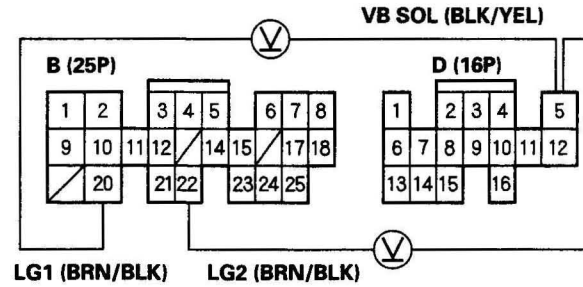
YES—Check for an open in the wires between PCM connector terminal D2 and the shift control solenoid valve B and between the No. 1 terminal of the shift control solenoid valve B connector and ground (G101).■

NO—Replace the shift control solenoid valve B.■

11. Turn the ignition switch ON (II).

12. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

NO—Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box.■

BACK

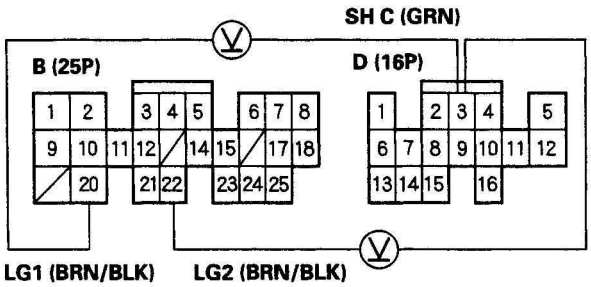
Protected by AR

DTC P0763: Problem in Shift Control Solenoid Valve C Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the B (25P) and D (16P) connectors from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between PCM connector terminals D3 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

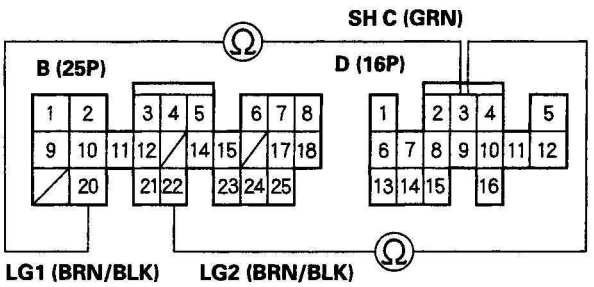
Is there voltage?

YES – Repair short to power in the wire between the D3 terminal and the shift control solenoid valve C. ■

NO – Go to step 5.

5. Turn the ignition switch OFF.
6. Measure the resistance between PCM connector terminals D3 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

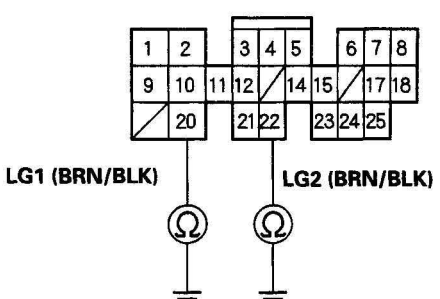
Is the resistance 12–25 Ω ?

YES – Go to step 11.

NO – Go to step 7.

7. Check for continuity between PCM connector terminal B20 and body ground, and between B22 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Go to step 8.

NO – Repair open in the wires between PCM connector terminals B20 and B22 and ground (G 101). Repair poor ground (G101). ■

(cont'd)

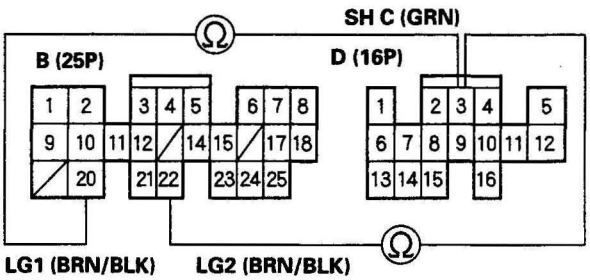
Protected by AR

DTC Troubleshooting (cont'd)

8. Disconnect the 2P connector from shift control solenoid valve B.

9. Check for continuity between PCM connector terminals D3 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

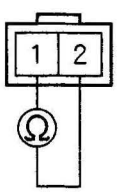
Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal D3 and the shift control solenoid valve C.■

NO—Go to step 10.

10. Measure shift control solenoid valve C resistance at the solenoid valve connector.

SHIFT CONTROL SOLENOID VALVE C CONNECTOR



Terminal side of male terminals

Is the resistance 12—25 Ω ?

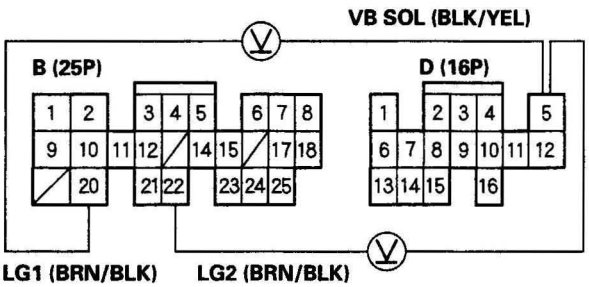
YES—Check for an open in the wires between PCM connector terminal D3 and the shift control solenoid valve C and between the No. 1 terminal of the shift control solenoid valve C connector and ground (G101).■

NO—Replace shift control solenoid valve C.■

11. Turn the ignition switch ON (II).

12. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

NO—Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box.■

BACK

Protected by AR

DTC P1705: Short in A/T Gear Position Switch Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Observe the A/T gear position indicator, and shift each position separately.

   Do any indicators stay on when the shift lever is not in that position?

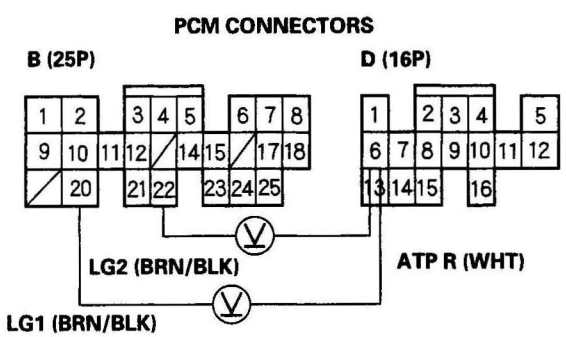
   YES – Go to step 3.

   NO – The system is OK at this time. Check the wire harness for damage. ■
3. Disconnect the A/T gear position switch connector.

   Do all gear position indicators go out?

   YES – Replace the A/T gear position switch. ■

   NO – Go to step 4.
4. Turn the ignition switch OFF, and connect the A/T gear position switch connector.
5. Turn the ignition switch ON (II).
6. Shift to all positions other than [R].
7. Measure the voltage between PCM connector terminals D6 and B20 or B22.



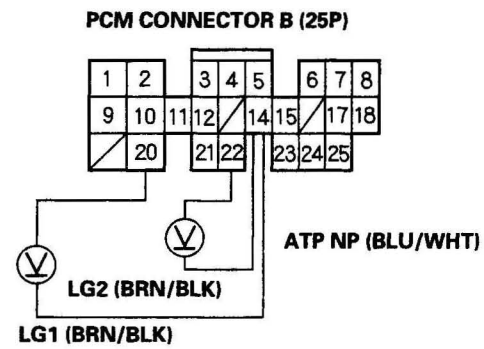
Wire side of female terminals

Is there battery voltage?

YES – Go to step 8.

NO – Check for a short in the wire between PCM connector terminal D6 and the A/T gear position switch or A/T gear position indicator, and check for an open in the wires between PCM connector terminals B20 and B22 and body ground (G101). If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

8. Shift to all positions other than [P] or [N].
9. Measure the voltage between PCM connector terminals B14 and B20 or B22.



Wire side of female terminals

Is there about 5 V?

YES – Go to step 10.

NO – Check for a short in the wire between PCM connector terminal B14 and the A/T gear position switch, and in the [P] and [N] position signal wires between the A/T gear position indicator and the A/T gear position switch. If necessary, substitute a known-good PCM and recheck. ■

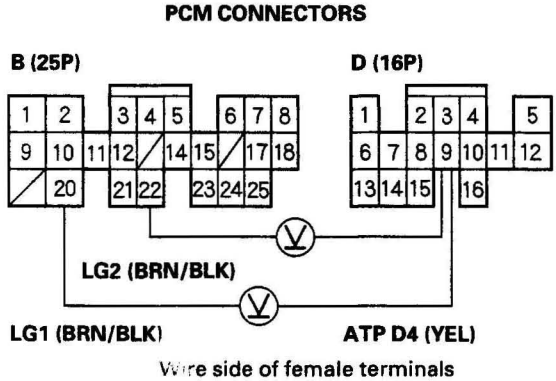
10. Shift to all positions other than [D4].

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

11. Measure the voltage between PCM connector terminals D9 and B20 or B22.



Wire side of female terminals

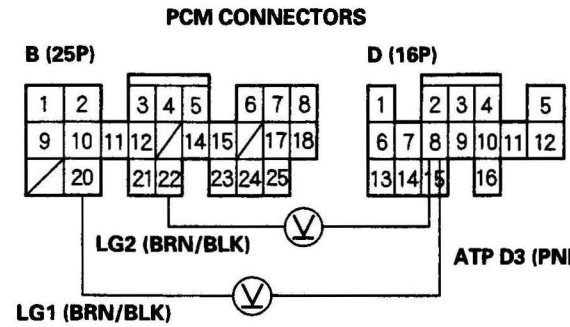
Is there about 5 V?

YES – Go to step 12.

NO – Check for a short in the wire between PCM connector terminal D9 and the A/T gear position switch. If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

12. Shift to all positions other than D₃.

13. Measure the voltage between PCM connector terminals D8 and B20 or B22.



Wire side of female terminals

Is there battery voltage?

YES – Go to step 14.

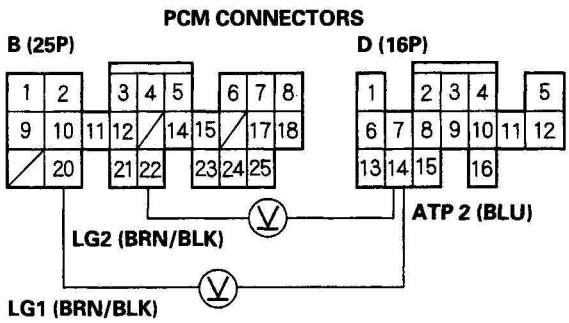
NO – Check for a short in the wire between PCM connector terminal D8 and the A/T gear position switch or A/T gear position indicator. If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

BACK

Protected by AR

14. Shift to all positions other than 2.

15. Measure the voltage between PCM connector terminals D14 and B20 or B22.



Wire side of female terminals

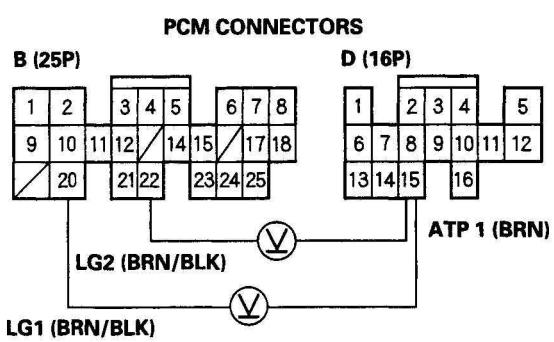
Is there battery voltage?

YES – Go to step 16.

NO – Check for short in the wire between PCM connector terminal D14 and the A/T gear position switch or A/T gear position indicator. If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

16. Shift to all positions other than 1.

17. Measure the voltage between PCM connector terminals D15 and B20 or B22.



Wire side of female terminals

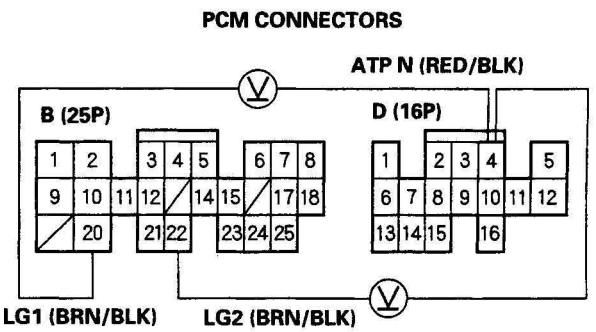
Is there battery voltage?

YES – Go to step 18.

NO – Check for a short in the wire between PCM connector terminal D15 and the A/T gear position switch or A/T gear position indicator. If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

18. Shift to all positions other than N.

19. Measure the voltage between PCM connector terminals D4 and B20 or B22.



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for a short in the wire between PCM connector terminal D4 and the A/T gear position switch or A/T gear position indicator. If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P1706: Open in A/T Gear Position Switch Circuit

NOTE: Record all freeze data before you troubleshoot.

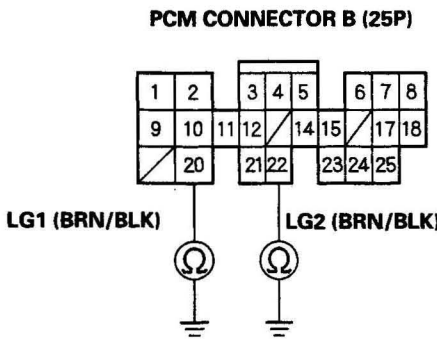
1. Test the A/T gear position switch (see page 14-144).

   Is the switch OK?

   YES – Go to step 2.

   NO – Replace the A/T gear position switch. ■

2. Check for continuity between PCM connector terminals B20 and B22 and body ground.



Wire side of female terminals

   Is there continuity?

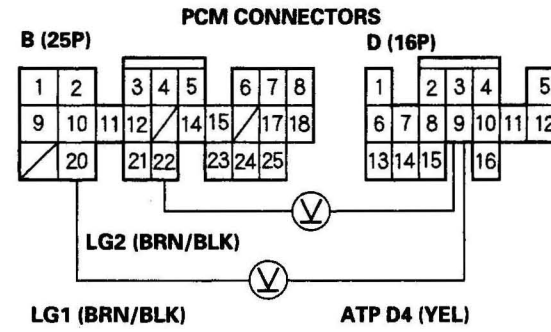
   YES – Go to step 3.

   NO – Repair open in the wires between PCM connector terminals B20 and B22 and ground (G101). Repair poor ground (G101). ■

3. Turn the ignition switch ON (II).

4. Shift to the D4 position.

5. Measure the voltage between PCM connector terminals D9 and B20 or B22.



Wire side of female terminals

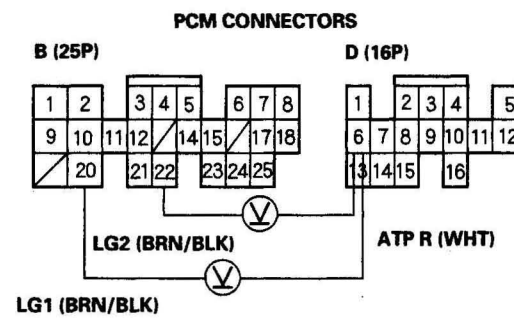
   Is there voltage?

   YES – Repair open in the wire between PCM connector terminal D9 and the A/T gear position switch. ■

   NO – Go to step 6.

6. Shift to the R position.

7. Measure the voltage between PCM connector terminals D6 and B20 or B22.



Wire side of female terminals

   Is there voltage?

   YES – Repair open in the wire between PCM connector terminal D6 and the A/T gear position switch. ■

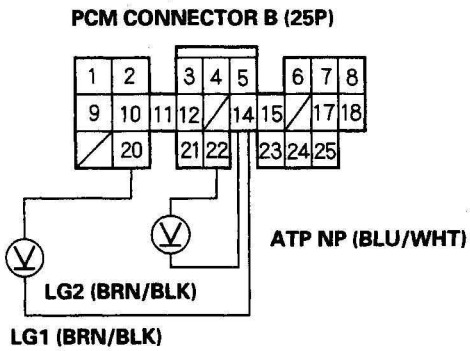
   NO – Go to step 8.

BACK

Protected by AR

8. Shift to the [P] or [N] position.

9. Measure the voltage between PCM connector terminals B14 and B20 or B22.



Wire side of female terminals

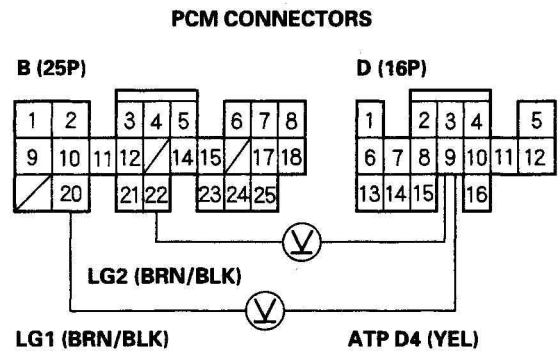
Is there voltage?

YES – Repair open in the wire between PCM connector terminal B14 and the A/T gear position switch. ■

NO – Go to step 10.

10. Shift to the [D3] position.

11. Measure the voltage between PCM connector terminals D8 and B20 or B22.



Wire side of female terminals

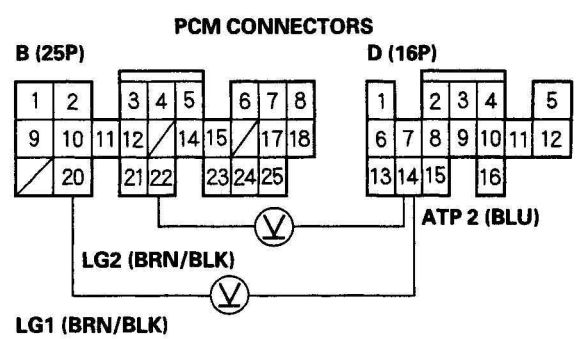
Is there voltage?

YES – Repair open in the wire between PCM connector terminal D8 and the A/T gear position switch. ■

NO – Go to step 12.

12. Shift to the [2] position.

13. Measure the voltage between PCM connector terminals D14 and B20 or B22.



Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D14 and the A/T gear position switch. ■

NO – Go to step 14.

(cont'd)

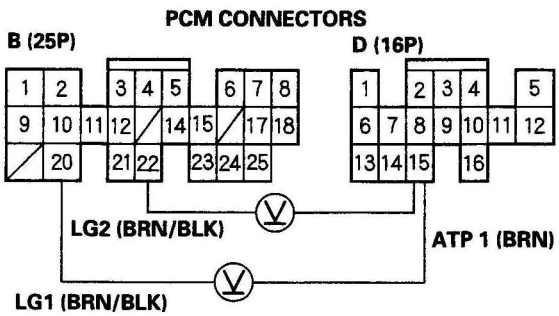
BACK

Protected by AR

DTC Troubleshooting (cont'd)

14. Shift to the 1 position.

15. Measure the voltage between PCM connector terminals D15 and B20 or B22.



Wire side of female terminals

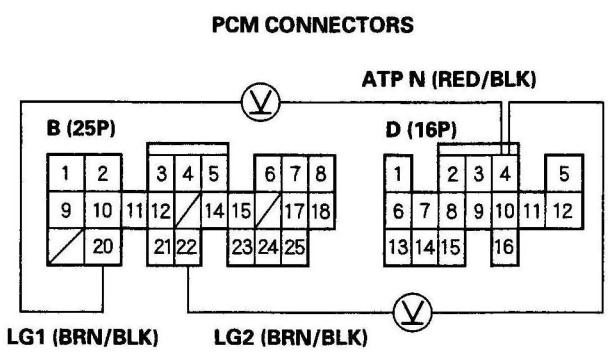
Is there voltage?

YES—Repair open in the wire between PCM connector terminal D15 and the A/T gear position switch. ■

NO—Go to step 16.

16. Shift to the N position.

17. Measure the voltage between PCM connector terminals D4 and B20 or B22.



Wire side of female terminals

Is there voltage?

YES—Repair open in the wire between PCM connector terminal D4 and the A/T gear position switch. ■

NO—Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

BACK

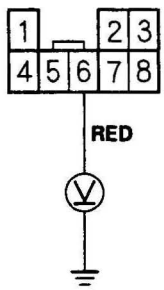
Protected by AR

DTC P1709: Problem in A/T Shift Switch Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Remove the center console.
3. Disconnect the A/T shift switch connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the No. 6 terminal of the A/T shift switch connector and body ground.

A/T SHIFT SWITCH CONNECTOR



Wire side of female terminals

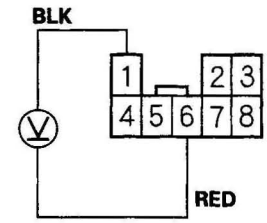
Is there about 5V?

YES—Go to step 6.

NO—Repair open or short in the wire between the E9 terminal of the PCM and the A/T shift switch connector.■

6. Measure the voltage between the No. 1 and No. 6 terminal of the A/T shift switch connector.

A/T SHIFT SWITCH CONNECTOR



Wire side of female terminals

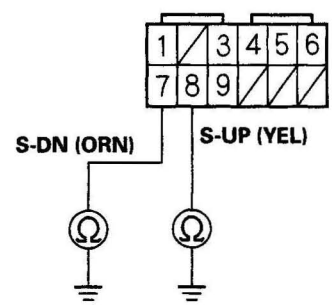
Is there about 5V?

YES—Go to step 7.

NO—Repair open in the wire between the No. 1 terminal of the A/T shift switch connector and ground, and repair poor ground (G501).■

7. Turn the ignition switch OFF.
8. Disconnect the E (12P) connector from the PCM.
9. Check for continuity between PCM connector terminal E7 and body ground, and between E8 and body ground.

PCM CONNECTOR E (12P)



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminals E7 and E8 and the A/T shift switch connector.■

NO—Go to step 10.

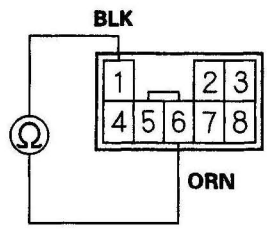
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

10. Measure the resistance between the No. 6 and No. 1 terminals of the A/T shift switch connector with the shift lever in the sequential sportshift mode position and when releasing it from the sequential sportshift mode position.

A/T SHIFT SWITCH CONNECTOR



Terminal side of male terminals

Is the resistance 0 Ω in the sequential sportshift mode position, and 10 MΩ or more when out of the sequential sportshift mode position?

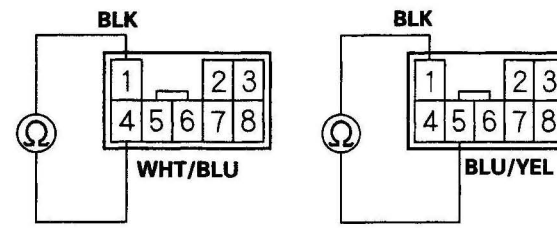
YES—Go to step 11.

NO—Faulty A/T shift switch. Replace the shift lever detent bracket assembly.■

11. Shift the shift lever into the sequential sportshift mode position.

12. Measure the resistance between the No. 4 and No. 1 terminals of the A/T shift switch connector while pushing the shift lever toward the "+" mark on the A/T gear position indicator panel; then measure the resistance in neutral position. Measure the resistance between the No. 5 and No. 1 terminals while pulling the shift lever toward "—" mark; then measure the resistance in neutral position.

A/T SHIFT SWITCH CONNECTOR



Terminal side of male terminals

Is the resistance 0 Ω with the shift lever pushed toward the "+ "mark, and pulled toward the "— " mark, and is it 10 MΩ or more with it released?

YES—Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

NO—Faulty A/T shift switch. Replace the shift lever detent bracket assembly.■

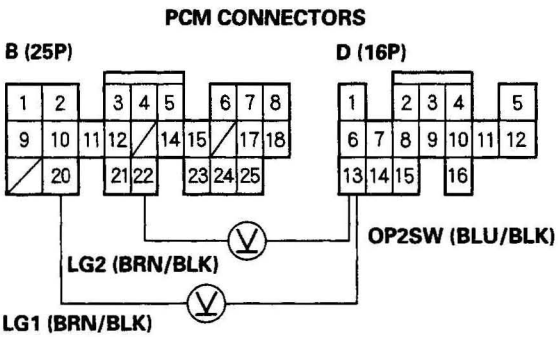
BACK

Protected by AR

DTC P1738: Problem in 2nd Clutch Pressure Switch Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Measure the voltage between PCM connector terminals D13 and B20 or B22.



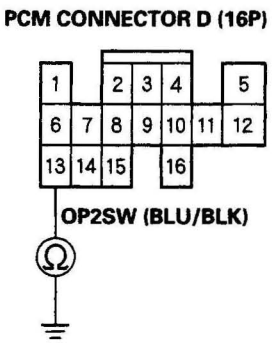
Wire side of female terminals

Is there battery voltage?

YES – Go to step 7.

NO – Go to step 3.

3. Turn the ignition switch OFF.
4. Disconnect the D (16P) connector from the PCM.
5. Disconnect the 2nd clutch pressure switch connector.
6. Check for continuity between PCM connector terminal D13 and body ground.



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal D13 and the 2nd clutch pressure switch. ■

NO – Disconnect the 2nd clutch pressure switch connector, and go to step 15.

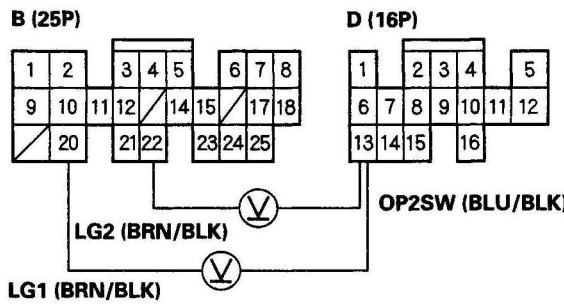
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Raise the front of the vehicle, and make sure it is securely supported.
8. Set the parking brake, and block the rear wheels securely.
9. Start the engine, cancel the TCS, then shift to the 2 position and drive for more than 5 seconds.
10. Measure the voltage between PCM connector terminals D13 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

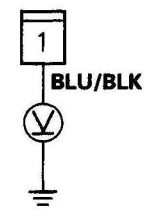
Is there about 0 V?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Go to step 11.

11. Turn the ignition switch OFF.
12. Disconnect the 2nd clutch pressure switch connector.
13. Turn the ignition switch ON (II).
14. Measure the voltage between the 2nd clutch pressure switch connector terminal and body ground.

2ND CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminal

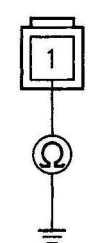
Is there battery voltage?

YES – Go to step 15.

NO – Repair open in the wire between the 2nd clutch pressure switch and the PCM. ■

15. Measure the resistance between the 2nd clutch pressure switch connector terminal and body ground.

2ND CLUTCH PRESSURE SWITCH CONNECTOR



Terminal side of male terminals

Is the resistance 10 MΩ or more?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Replace the 2nd clutch pressure switch

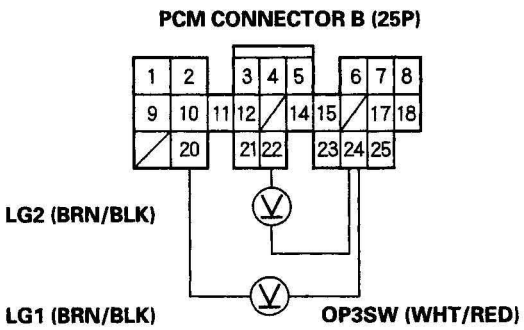
BACK

Protected by AR

DTC P1739: Problem in 3rd Clutch Pressure Switch Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Measure the voltage between PCM connector terminals B24 and B20 or B22.



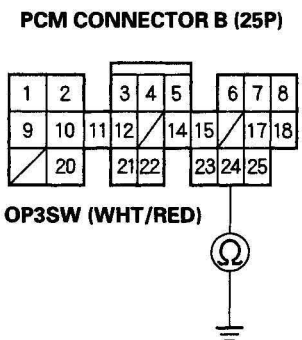
Wire side of female terminals

Is there battery voltage?

YES – Go to step 7.

NO – Go to step 3.

3. Turn the ignition switch OFF.
4. Disconnect the B (25P) connector from the PCM.
5. Disconnect the 3rd clutch pressure switch connector.
6. Check for continuity between PCM connector terminal B24 and body ground.



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal B24 and the 3rd clutch pressure switch. ■

NO – Disconnect the 3rd clutch pressure switch connector, and go to step 15.

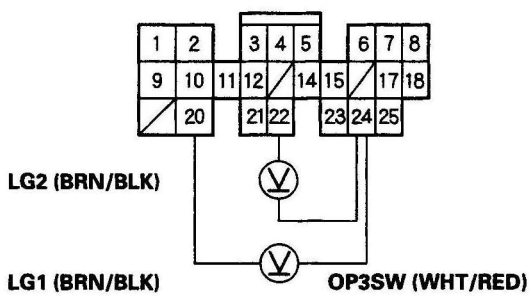
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Raise the front of the vehicle, and make sure it is securely supported.
8. Set the park brake, and block rear wheels securely.
9. Start the engine, cancel the TCS, then shift to the D3 position and drive in 3rd gear for more than 5 seconds.
10. Measure the voltage between PCM connector terminals B24 and B20 or B22.

PCM CONNECTOR B (25P)



Wire side of female terminals

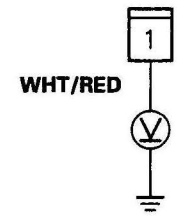
Is there about 0 V?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Go to step 11.

11. Turn the ignition switch OFF.
12. Disconnect the 3rd clutch pressure switch connector.
13. Turn the ignition switch ON (II).
14. Measure the voltage between the 3rd clutch pressure switch connector terminal and body ground.

3RD CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminal

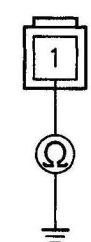
Is there battery voltage?

YES – Go to step 15.

NO – Repair open in the wire between the 3rd clutch pressure switch and the PCM. ■

15. Measure the resistance between the 3rd clutch pressure switch connector terminal and body ground.

3RD CLUTCH PRESSURE SWITCH CONNECTOR



Terminal side of male terminal

Is the resistance 10 MΩ or more?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Replace the 3rd clutch pressure switch. ■

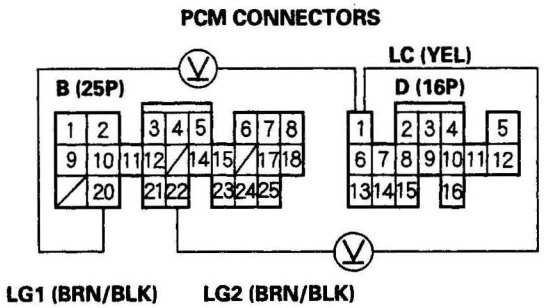
BACK

Protected by AR

DTC P1753: Problem in Lock-up Control Solenoid Valve Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the B (25P) and D (16P) connectors from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between PCM connector terminals D1 and B20 or B22.



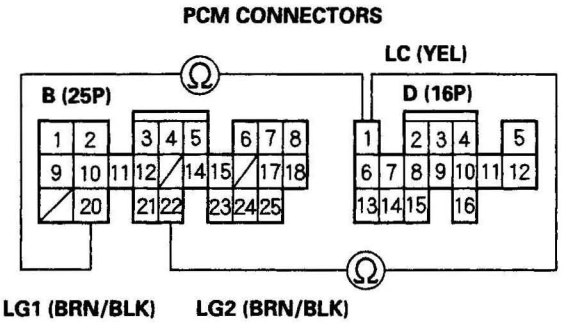
Wire side of female terminals

Is there voltage?

YES – Repair short to power in the wire between PCM connector terminal D1 and the lock-up control solenoid valve. ■

NO – Go to step 5.

5. Turn the ignition switch OFF.
6. Measure the resistance between PCM connector terminals D1 and B20 or B22.



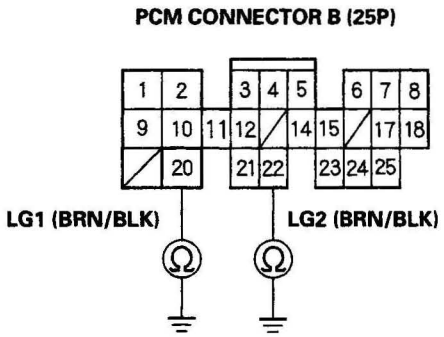
Wire side of female terminals

Is the resistance 12 – 25 Ω ?

YES – Go to step 11.

NO – Go to step 7.

7. Check for continuity between PCM connector terminals B20 and B22 and body ground.



Wire side of female terminals

Is there continuity?

YES – Go to step 8.

NO – Repair open in the wires between PCM connector terminals B20 and B22 and ground (G101). Repair poor ground (G101). ■

(cont'd)

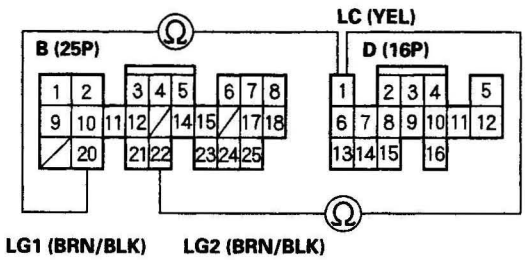
Protected by AR

DTC Troubleshooting (cont'd)

8. Disconnect the 3P connector from the lock-up control solenoid valve/shift control solenoid valve A assembly.

9. Check for continuity between PCM connector terminals D1 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

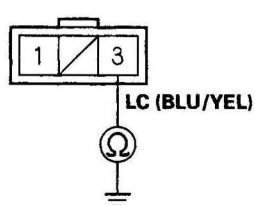
Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal D1 terminal and the lock-up control solenoid valve. ■

NO—Go to step 10.

10. Measure the resistance between the No.3 terminal of the lock-up control solenoid valve/shift control solenoid valve A assembly connector and body ground.

LOCK-UP CONTROL SOLENOID VALVE/ SHIFT CONTROL SOLENOID VALVE A ASSEMBLY CONNECTOR (3P)



Terminal side of male terminals

Is the resistance 12—25Ω ?

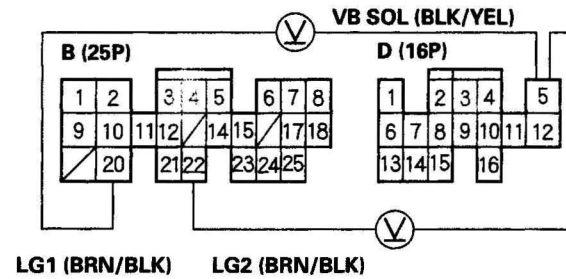
YES—Check for an open in the wire between PCM connector terminal D1 and the lock-up control solenoid valve. ■

NO—Replace the lock-up control solenoid valve/ shift control solenoid valve A assembly. ■

11. Turn the ignition switch ON (II).

12. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO—Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

BACK

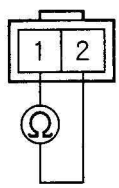
Protected by AR

DTC P1768: Problem in A/T Clutch Pressure Control Solenoid Valve A Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Disconnect the 2P connector from A/T clutch pressure control solenoid valve A.
2. Measure A/T clutch pressure control solenoid resistance at the solenoid valve connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Terminal side of male terminals

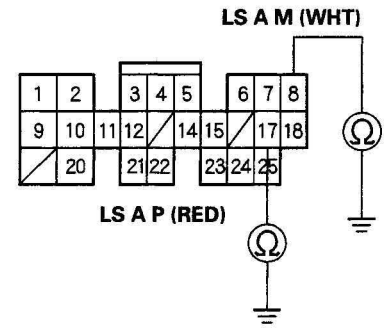
Is the resistance about 5 Ω ?

YES – Go to step 3.

NO – Replace the A/T clutch pressure control solenoid valves A and B. ■

3. Disconnect the B (25P) connector from the PCM.
4. Check for continuity between body ground and PCM connector terminals B8 and B17 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

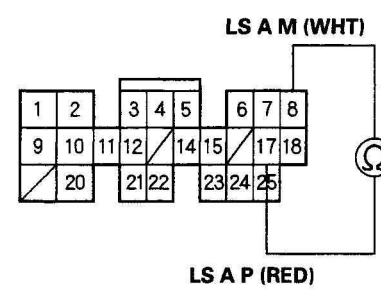
Is there continuity?

YES – Repair short to ground in the wires between PCM connector terminals B8 and B17 and A/T clutch pressure control solenoid valve A. ■

NO – Go to step 5.

5. Connect the A/T clutch pressure control solenoid valve A connector.
6. Measure the resistance between PCM connector terminals B8 and B17.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is the resistance about 5 Ω ?

YES – Go to step 7.

NO – Repair loose terminal or open in the wires between PCM connector terminals B8 and B17 and A/T clutch pressure control solenoid valve A. ■

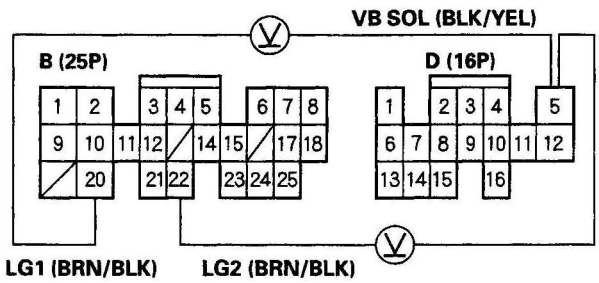
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Disconnect the D (16P) connector from the PCM.
8. Turn the ignition switch ON (II).
9. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

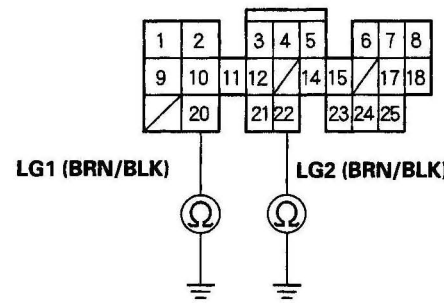
Is there battery voltage?

YES – Go to step 10.

NO – Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box, and between PCM connector terminals B20 and B22 and ground (G101). ■

10. Turn the ignition switch OFF.
11. Check for continuity between PCM connector terminals B20 and B22 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Repair open in the wire between PCM connector terminals B2, B10, B20 and B22 and ground (G101). Repair poor ground (G101). ■

BACK

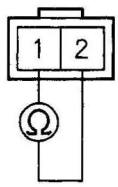
Protected by AR

DTC P1773: Problem in A/T Clutch Pressure Control Solenoid Valve B Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Disconnect the 2P connector from A/T clutch pressure control solenoid valve B.
2. Measure A/T clutch pressure control solenoid resistance at the solenoid valve connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



Terminal side of male terminals

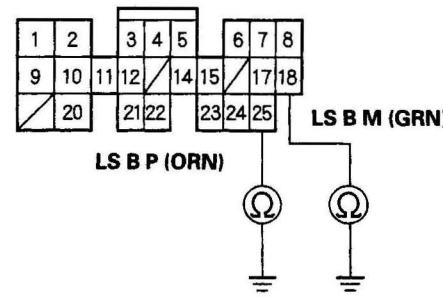
Is the resistance about 5 Ω ?

YES – Go to step 3.

NO – Replace the A/T clutch pressure control solenoid valves A and B. ■

3. Disconnect the B (25P) connector from the PCM.
4. Check for continuity between body ground and PCM connector terminals B18 and B25 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

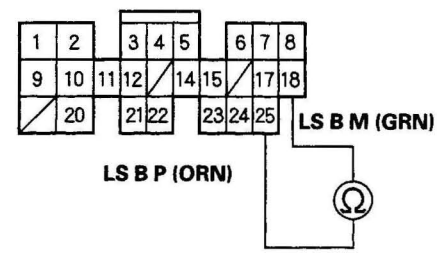
Is there continuity?

YES – Repair short to ground in the wires between PCM connector terminals B18 and B25 and A/T clutch pressure control solenoid valve B. ■

NO – Go to step 5.

5. Connect the A/T clutch pressure control solenoid valve B connector.
6. Measure the resistance between PCM connector terminals B18 and B25.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is the resistance about 5 Ω ?

YES – Go to step 7.

NO – Repair loose terminal or open in the wires between PCM connector terminals B18 and B25 and A/T clutch pressure control solenoid valve B. ■

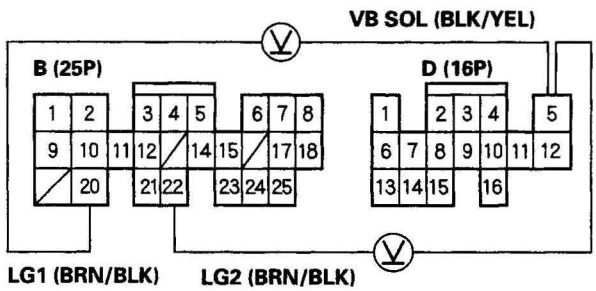
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Disconnect the D (16P) connector from the PCM.
8. Turn the ignition switch ON (II).
9. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

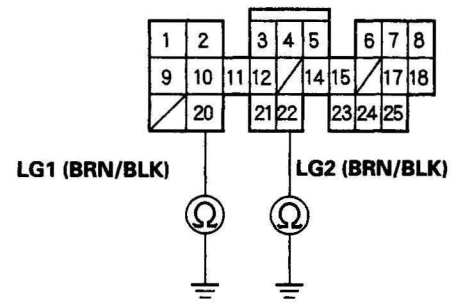
Is there battery voltage?

YES – Go to step 10.

NO – Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

10. Turn the ignition switch OFF.
11. Check for continuity between PCM connector terminals B20 and B22 and body ground individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Repair open in the wire between PCM connector terminals B2, B10, B20 and B22 and ground (G101). Repair poor ground (G101). ■

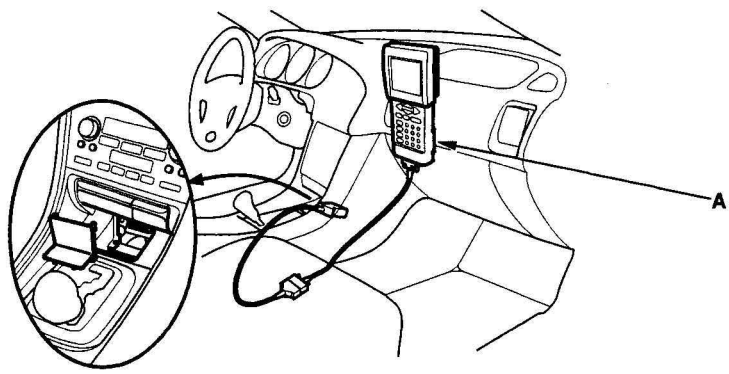
BACK

Protected by AR

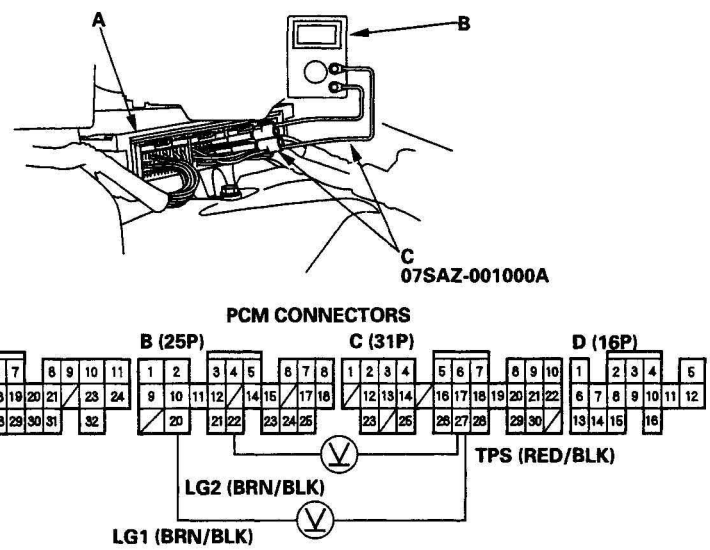
Road Test

Special Tools Required
Backprobe set 07SAZ-001000A (Two required)

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Apply the parking brake, and block rear wheels. Start the engine, then shift to the D4 position while depressing the brake pedal. Depress the accelerator pedal, and release it suddenly. The engine should not stall.
3. Repeat the same test in the D3 position.
4. Connect the Honda PGM Tester (A), and go to the PGM-FI Data List; then go to step 7. If you don't have a PGM Tester, go to step 5.



5. Remove the center console (see page 20-63), then remove the PCM (A).
6. Connect a digital multimeter (B) and the special tools (C) to check voltage between the C27 (+) terminal and B20 (−) or B22 (−) terminal of the PCM.



Wire side of female terminals

(cont'd)

Protected by AR

Road Test (cont'd)

7. Test-drive the vehicle on a flat road in the D4 position. Check for abnormal noise and clutch slippage. While driving, check that the shift points occur at the proper speeds by monitoring the throttle position sensor voltage and comparing your shift point speeds and voltage to those in the table. (The throttle position sensor voltage represents the throttle opening.)

Upshift-D4 position

Throttle Opening	Unit of Speed	1st → 2nd	2nd → 3rd	3rd → 4th	Lock-up ON
Throttle position sensor voltage: 0.7 V	mph	16–17	24–26	34–38	47–49
	km/h	26–28	38–42	54–60	75–79
Throttle position sensor voltage: 2.25 V	mph	28–29	50–53	73–77	84–88
	km/h	43–47	80–86	118–124	135–141
Fully-opened throttle. Throttle position sensor voltage: 4.5 V	mph	34–38	64–68	98–101	99–103
	km/h	55–61	103–109	157–163	160–166

Downshift-D4 position

Throttle Opening	Unit of Speed	Lock-up OFF	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.8 V	mph	44–47	17–19	———	6–8 (3rd → 1st)
	km/h	71–75	27–31	———	9–13 (3rd → 1st)
Throttle position sensor voltage: 2.25 V	mph	71–75	———	———	———
	km/h	115–121	———	———	———
Fully-opened throttle. Throttle position sensor voltage: 4.5 V	mph	90–94	89–92	57–61	27–31
	km/h	145–151	142–148	92–98	44–50

8. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th, then shift from the D4 position to 2 position. The vehicle should immediately begin slowing down from engine braking.

9. Check for abnormal noise and clutch slippage in the following positions.

   1 (1st Gear) Position
   Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage. Upshifts should not occur with the shift lever in this position.

   2 (2nd Gear) Position
   Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage. Upshifts and downshifts should not occur with the shift lever in this position.

   R (Reverse) Position
   Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

10. Test in the P (Park) Position.
    Park the vehicle on a slope (approx. 16°), apply the parking brake, and shift into the P position. Release the brake; the vehicle should not move.

BACK

Protected by AR

Stall Speed Test

1. Engage the parking brake, and block the front wheels.
2. Connect a tachometer to the engine, and start the engine.
3. Make sure the A/C switch is OFF.
4. After the engine has warmed up to normal operating temperature (the radiator fan comes on), shift to the [2] position.
5. Fully depress the brake pedal and accelerator for 6 to 8 seconds, and note engine speed. Do not move the shift lever while raising engine speed.
6. Allow two minutes for cooling, then repeat the test in the [D4], [1], and [R] positions.

NOTE:
- Do not test stall speed for more than 10 seconds at a time.
- Stall speed tests should be used for diagnostic purposes only.
- Stall speed should be the same in the [D4], [2], [1], and [R] positions.
- Do not test stall speed with the A/T pressure gauges installed.

Stall Speed rpm:
Specification: 2,400 rpm
Service Limit: 2,250—2,550 rpm

TROUBLE	PROBABLE CAUSE
Stall rpm high in the [D4], [2], [1], and [R] positions	• Low fluid level or ATF pump output • Clogged ATF strainer • Pressure regulator valve stuck closed • Slipping clutch
Stall rpm high in the [1] position	Slippage of 1st clutch
Stall rpm high in the [2] position	Slippage of 2nd clutch
Stall rpm high in the [R] position	Slippage of 4th clutch
Stall rpm low in the [D4], [2], [1], and [R] positions	• Engine output low • Torque converter one-way clutch slipping

Protected by AR

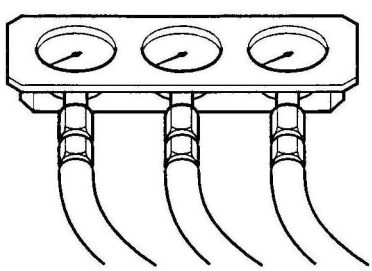
Pressure Tests

Special Tools Required
- A/T oil pressure gauge set 07406-0020400 or 07406-0020401
- A/T pressure hose, 2210 mm 07MAJ-PY4011A
- A/T pressure hose adapter 07MAJ-PY40120

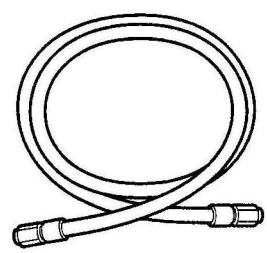
1. Before testing, be sure the transmission fluid is filled to the proper level.
2. Raise the front of the vehicle, and make sure it is securely supported.
3. Set the parking brake, and block rear wheels securely.
4. Allow the front wheels to rotate freely.
5. Warm up the engine (the radiator fan comes on), then stop it and connect a tachometer.
6. Connect the oil pressure gauges to each inspection hole securely, and do not allow dust or other foreign particles to enter the holes.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

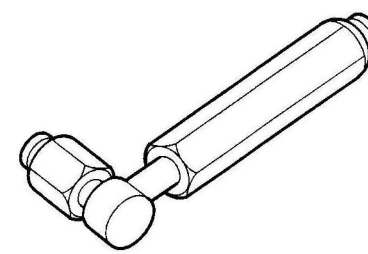
A/T OIL PRESSURE GAUGE SET W/PANEL 07406-0020400 or 07406-0020401

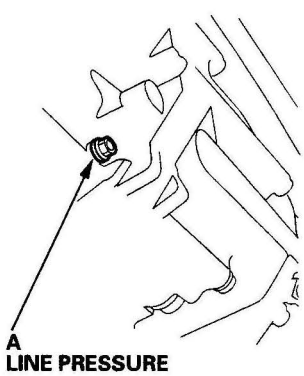


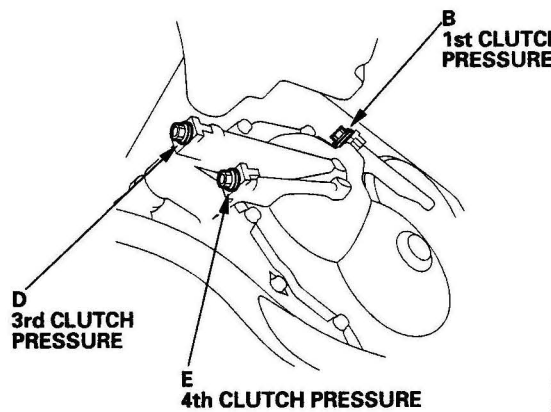
A/T PRESSURE HOSE, 2210 mm 07MAJ-PY4011A (4 Required)

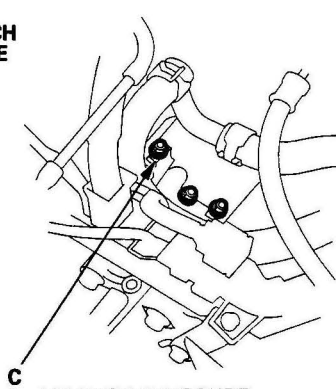


A/T PRESSURE HOSE ADAPTER 07MAJ-PY40120 (4 Required)









BACK

Protected by AR

7. Start the engine, and run it at 2,000 rpm in the [P] or [N] position.
8. Measure line pressure at line pressure inspection hole (A) in the [N] or [P] position.
   NOTE: Higher pressure may be indicated if measurements are made in shift lever positions other than [N] or [P].
9. Shift to the [1] position, and measure 1st clutch pressure at the 1st clutch pressure inspection hole (B).
10. Shift to the [2] position, and measure 2nd clutch pressure at the 2nd clutch pressure inspection hole (C).
11. Shift to the [P] position, then press the brake pedal and hold it.
12. Shift to the [D4] position, and release the brake pedal (the transmission should be in 1st gear).
13. Accelerate the engine to 2,500 rpm (the transmission will shift to 2nd gear).
14. Release the accelerator for more than 5 seconds after the transmission shifts to 2nd gear (the engine will come down to about 1,000 rpm).
15. Press the accelerator very slowly to increase engine speed to 2,000 rpm gradually over 5 seconds, then hold it at 2,000 rpm.
16. Measure 3rd and 4th clutch pressure at the 3rd clutch pressure inspection hole (D), and the 4th clutch pressure inspection hole (E), (the transmission will shift from 2nd gear to 3rd gear, and then to 4th gear).
17. Shift to the [R] position, and measure 4th clutch pressure at the 4th clutch pressure inspection hole.

PRESSURE	SHIFT LEVER POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Line (A)	[N] or [P]	No (or low) line pressure	Torque converter, ATF pump, pressure regulator valve, torque converter check valve	800 – 860 kPa (8.2 – 8.8 kgf/cm², 120 – 130 psi)	760 kPa (7.7 kgf/cm², 110 psi)
1st clutch (B)	[1]	No or low 1st pressure	1st clutch	790 – 870 kPa (8.1 – 8.9 kgf/cm², 120 – 130 psi)	750 kPa (7.6 kgf/cm², 110 psi)
2nd clutch (C)	[2]	No or low 2nd pressure	2nd clutch		
3rd clutch (D)	[D4]	No or low 3rd pressure	3rd clutch		
4th clutch (E)		No or low 4th pressure	4th clutch		
	[R]		Servo valve or 4th clutch		

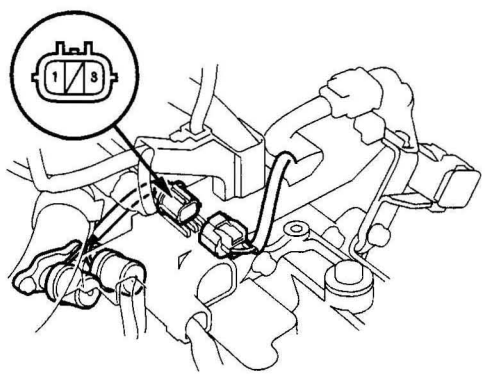
18. Reinstall the sealing bolts with new sealing washers, and tighten the bolts to the specified torque.
    TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

    NOTE: Do not reuse the old sealing washers.

Protected by AR

Lock-up Control Solenoid Valve - Shift Control Solenoid Valve A Assembly Test

1. Disconnect the 3P connector from the lock-up control solenoid valve/shift control solenoid valve A assembly.



2. Measure the resistance of the lock-up control solenoid valve between the No. 3 terminal of the 3P connector and body ground.

   STANDARD: 12–25 Ω

3. Measure the resistance of the shift control solenoid valve A between the No. 1 terminal of the 3P connector and body ground.

   STANDARD: 12–25 Ω

4. Replace the lock-up control solenoid valve/shift control solenoid valve A assembly if either resistance is out of specification.

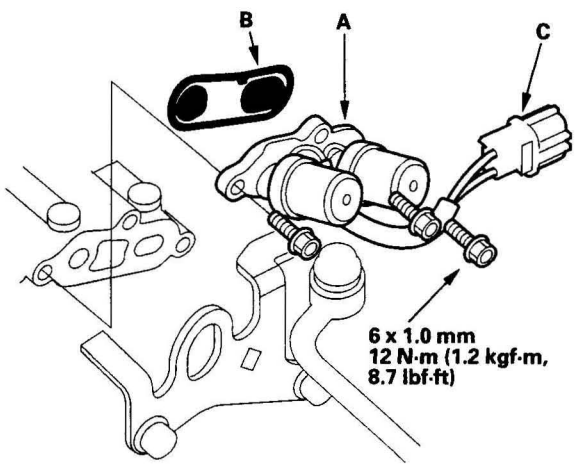
5. If the resistance is within the standard, connect the No. 1 terminal of the 3P connector to the battery positive terminal. A clicking sound should be heard. Connect the No. 3 terminal to the battery positive terminal. A clicking sound should be heard. Replace the lock-up control solenoid valve/shift control solenoid valve A assembly if no sound is heard.

Lock-up Control Solenoid Valve - Shift Control Solenoid Valve A Assembly Replacement

NOTE: Lock-up control solenoid valve/shift control solenoid valve A assembly must be removed/replaced as an assembly.

1. Remove the bolt securing the harness cover connector bracket, then remove the harness cover from the transmission hanger.

2. Remove the mounting bolts and lock-up control solenoid valve/shift control solenoid valve A assembly (A).



3. Clean the mounting surface and fluid passage, and install a new lock-up control solenoid valve/shift control solenoid valve A assembly with a new filter/gasket (B).

4. Install the harness cover on the transmission hanger, and install the connector bracket bolt.

5. Install the male terminal connector (C) of the solenoid connector on the harness cover.

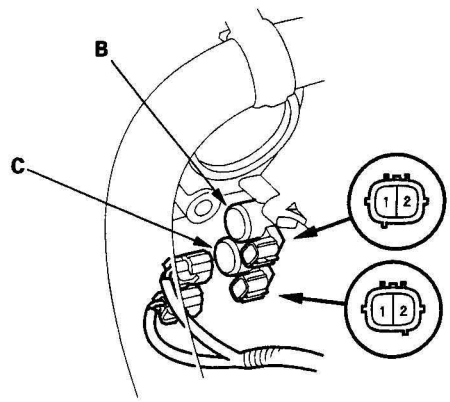
6. Check the connector for rust, dirt or oil, then reconnect it.

BACK

Protected by AR

Shift Solenoid Valves B and C Test

1. Remove the starter.
2. Disconnect the shift control solenoid valve B or C connector.



3. Measure the resistance between the No. 1 and No. 2 terminals of shift control solenoid valve B or C.

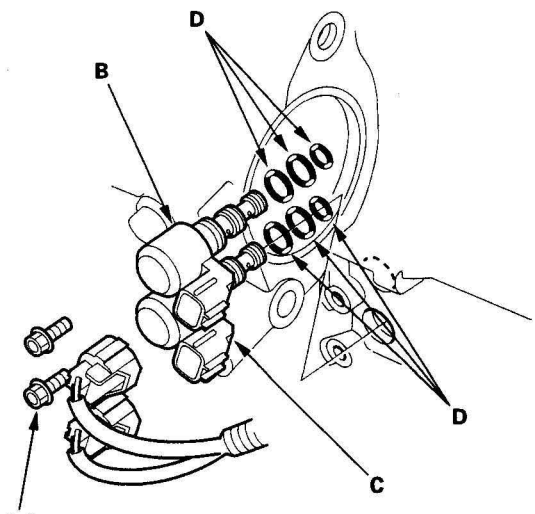
   STANDARD: 12–25 Ω

4. Replace shift control solenoid valve B or C if the resistance is out of standard.
5. If the resistance is within the standard, connect the No. 2 terminal of the shift control solenoid valve B or C connector to the battery positive terminal, and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard. Replace shift control solenoid valve B or C if no clicking sound is heard.

Shift Solenoid Valves B and C Replacement

NOTE: If shift control solenoid valve B and C are replaced or removed at the same time, be sure to reinstall them correctly. The shift control solenoid valve B connector is black, and the connector color of shift control solenoid valve C connector is brown.

1. If you are replacing shift control solenoid valve B, remove the starter.
2. If necessary, remove the mounting bolt and shift control solenoid valve B.



6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)

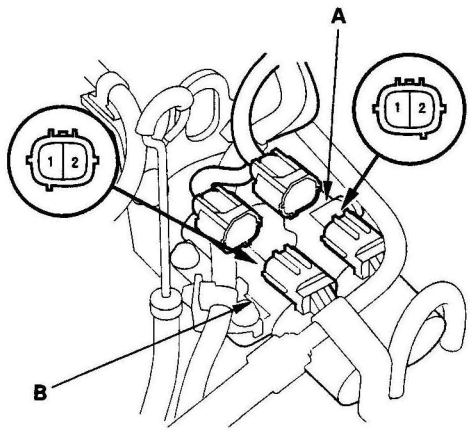
3. Remove the mounting bolt and shift control solenoid valve C.
4. Install a new shift control solenoid valve B or C with new O-rings (D). While installing the valves, do not allow dust or other foreign particles to enter the transmission.
5. Check the connector for rust, dirt or oil, then reconnect it.
6. Install the starter, if removed.

BACK

Protected by AR

A/T Clutch Pressure Control Solenoid Valves A and B Test

1. Disconnect the 2P connectors from A/T clutch pressure control solenoid valves A and B.



2. Measure the resistance between the No. 1 and No. 2 terminals of each connector.

   STANDARD: About 5.0 Ω

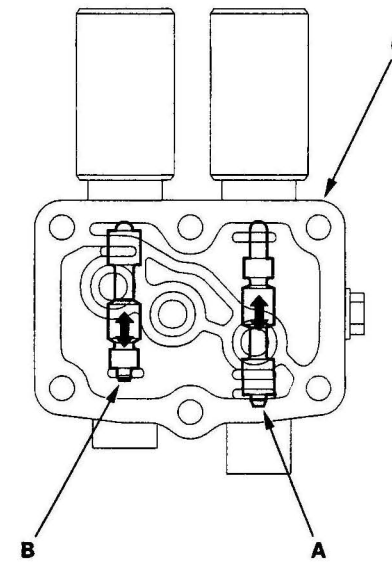
3. If the resistance of either solenoid is out of standard, replace the A/T clutch pressure control solenoid valves A and B.

4. Connect the No. 1 terminal of A/T clutch pressure control solenoid valves A and B to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. A clicking sound should be heard.

5. If not, remove the A/T clutch pressure control solenoid valves A and B.

6. Check the fluid passage of the A/T clutch pressure control solenoid valves for dust and dirt and clean the passage if necessary.

7. Connect the No. 1 terminal of A/T clutch pressure control solenoid valves A and B to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure A/T clutch pressure control solenoid valves A and B move.



8. Disconnect one of the battery terminals and check valve movement.

   NOTE: You can see the valve movement through the fluid passage in the mounting surface of the assembly body (C).

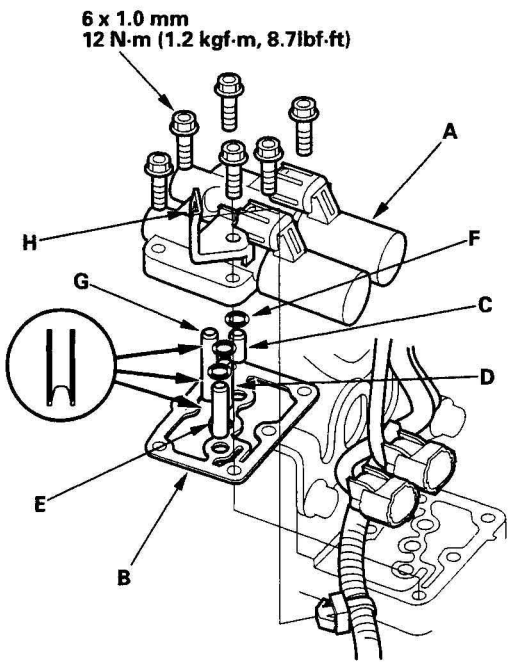
9. If either valve binds, or moves sluggishly, or if the solenoid does not operate, replace the A/T clutch pressure control solenoid valves A and B.

BACK

Protected by AR

A/T Clutch Pressure Control Solenoid Valves A and B Replacement

1. Remove the ATF cooler hose (outlet line) at the ATF cooler line. Turn the end of the cooler hose up to prevent ATF from flowing out, then plug the line and hose.
2. Remove the bolt securing the harness cover connector bracket, then remove the harness cover from the transmission hanger.
3. Remove the ATF cooler line (outlet line) from the transmission housing.
4. Remove the mounting bolts and the A/T clutch pressure control solenoid valves A and B (A).

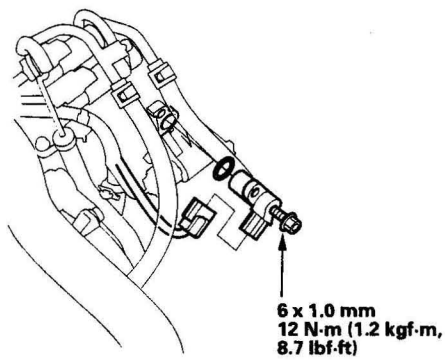


5. Clean the mounting surface and fluid passages of the A/T clutch pressure control solenoid valves A and B and the transmission housing.
6. Place a new gasket (B) on the transmission housing, then install the 8 x 18 mm ATF feed pipe (C), 8 x 26 mm pipe (D) and 8 x 36 mm pipe (E) with their filter side into the transmission housing.
7. Install new O-rings (F) over the feed pipes, and install the 8 x 40 mm ATF feed pipe (G).
8. Install the new A/T clutch pressure control solenoid valves A and B (A) and harness clamp bracket (H).
9. Check the A/T clutch pressure control solenoid valves A and B connectors for rust, dirt, or oil then connect them securely.
10. Install the ATF cooler line (outlet line), and connect the ATF cooler hose to the cooler line.

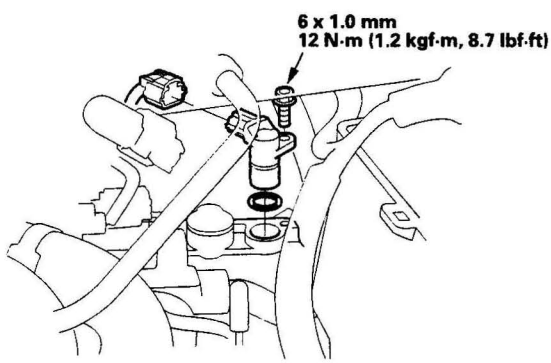
Protected by AR

Speed Sensor Replacement

1. Disconnect the connectors from the mainshaft and countershaft speed sensors.
2. Remove the bolt securing the mainshaft speed sensor, then remove the mainshaft speed sensor from the end cover.



3. Remove the bolt securing the countershaft speed sensor, then remove the countershaft speed sensor from the transmission housing.



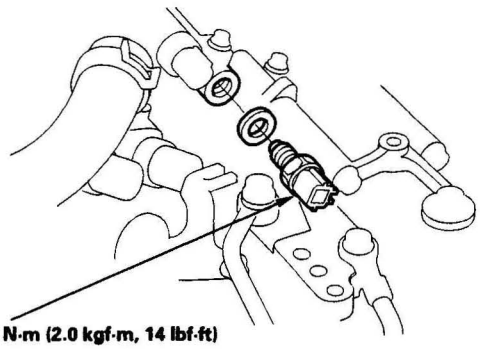
4. Replace the O-rings with new ones before installing the sensors.
5. Install the mainshaft and countershaft speed sensors, then connect the connectors.

BACK

Protected by AR

2nd Clutch Pressure Switch Replacement

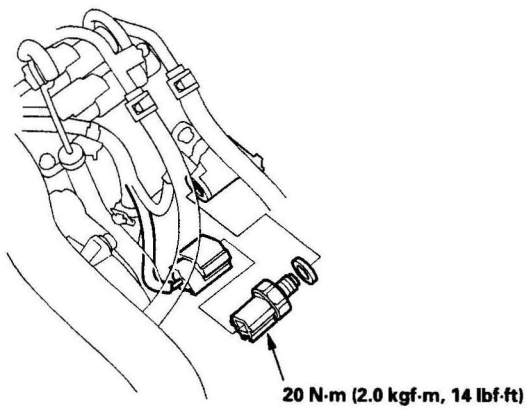
1. Disconnect the connector from the 2nd clutch pressure switch.



2. Replace the 2nd clutch pressure switch, then install a new one with a new sealing washer. Tighten the switch on the metal part, not the plastic part.
3. Reconnect the connector, making sure there is no water, oil, dust, or other foreign particles inside it.

3rd Clutch Pressure Switch Replacement

1. Disconnect the connector from the 3rd clutch pressure switch.



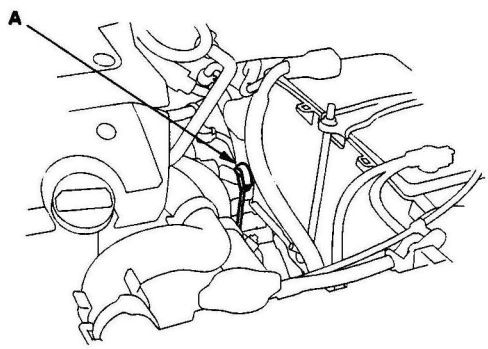
2. Replace the 3rd clutch pressure switch, then install a new one with a new sealing washer. Tighten the switch on the metal part, not the plastic part.
3. Reconnect the connector, making sure there is no water, oil, dust, or other foreign particles inside it.

Protected by AR

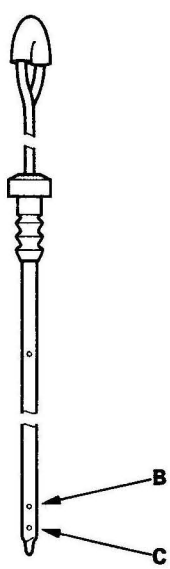
ATF Level Check

NOTE: Keep all foreign particles out of the transmission.

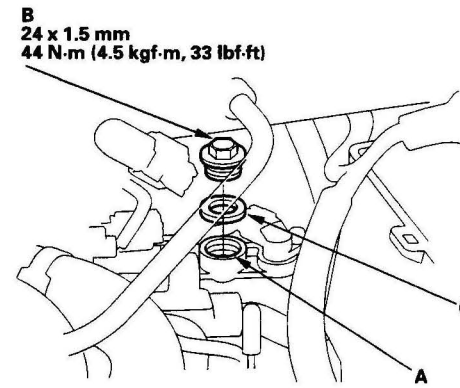
1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Park the vehicle on the level ground. Turn off the engine.
3. Remove the dipstick (yellow loop) (A) from the transmission, and wipe it with a clean cloth.



4. Insert the dipstick into the transmission.
5. Remove the dipstick and check the fluid level. It should be between the upper mark (B) and lower mark (C).



6. If the level is below the lower mark, pour the recommended fluid into the filler hole (A) to bring it to the upper mark. Always use Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.



7. Install the ATF filler bolt (B) with a new sealing washer (C).
8. Insert the dipstick back into the transmission.

BACK

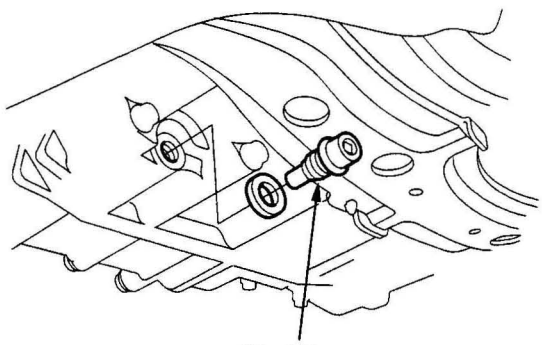
Protected by AR

ATF Replacement

NOTE: Keep all foreign particles out of the transmission.

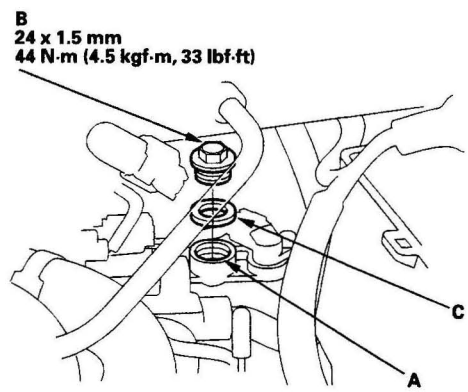
1. Bring the transmission up to operating temperature (the radiator fan comes on) by driving the vehicle.
2. Park the vehicle on the level ground, and turn the engine off.
3. Remove the ATF filler bolt and drain plug, and drain the automatic transmission fluid (ATF).

   NOTE: If a cooler flusher is to be used, refer to ATF Cooler Flushing (see page 14-123).



4. Reinstall the drain plug with a new sealing washer.
5. Refill the transmission with the recommended fluid into the filler hole (A) to the upper mark on the dipstick. Always use Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

   Automatic Transmission Fluid Capacity:
   2.7 ℓ (2.9 US qt) at changing
   7.1 ℓ (7.5 US qt) at overhaul

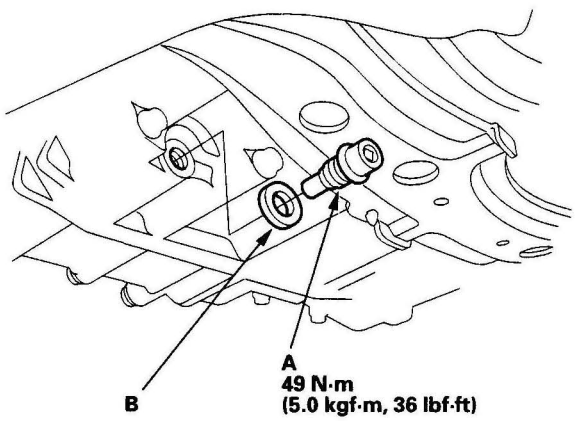


6. Install the ATF filler bolt (B) with a new sealing washer (C).

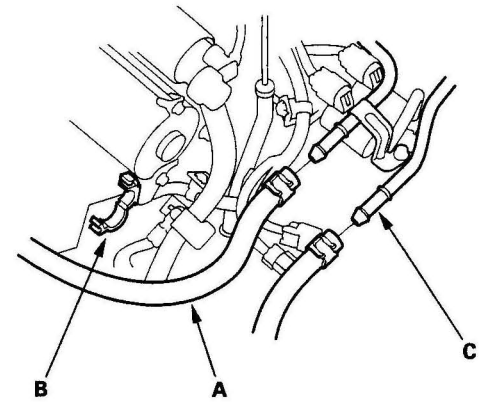
Protected by AR

Transmission Removal

1. Before disconnecting the battery, make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset stations.
2. Remove the bolts securing the support struts to the hood. Secure the hood in a vertical position, then reinstall the right strut in the lower position.
3. Disconnect the battery negative terminal, then remove the positive terminal.
4. Remove the battery hold-down bracket, then remove the battery and battery tray.
5. Remove the battery cable clamps from the battery base. Remove the battery base.
6. Loosen the mounting bolt securing the battery base bracket, then remove the battery base bracket.
7. Remove the intake air duct.
8. Raise the vehicle, and make sure it is securely supported. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer (B).



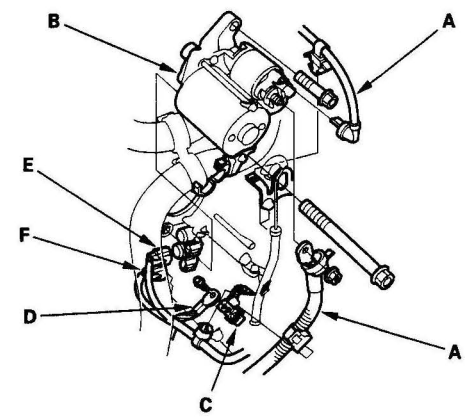
9. Remove the ATF cooler hose (A) from the clamp (B) on the starter.



10. Remove the ATF cooler hoses (A) from the ATF cooler lines (C). Turn the ends of the ATF cooler hoses up to prevent ATF flowing out, then plug the ATF cooler hoses and lines.

    NOTE: Check for any signs of leakage at the hose joints.

11. Remove the starter cables (A) from the starter (B) and clamp bracket (C), then remove the starter.

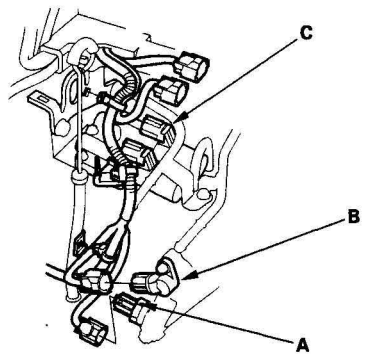


12. Remove the transmission ground terminal (D).
13. Disconnect the shift control solenoid valve B connector (E), and C connector (F), then remove the harness clamp from the clamp bracket.

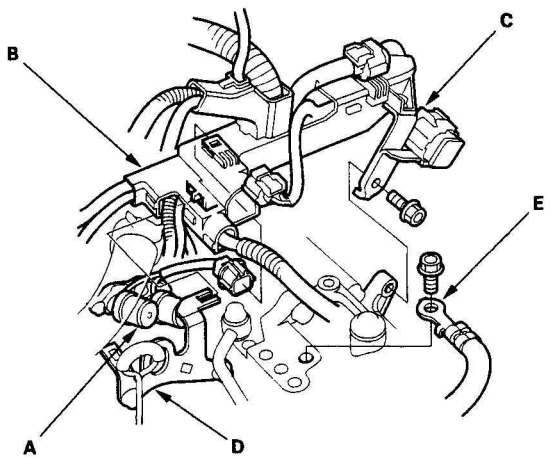
BACK

Protected by AR

14. Disconnect the connectors from the 3rd clutch pressure switch (A), mainshaft speed sensor (B), and A/T clutch pressure control solenoid valves A and B (C), then remove the harness clamps from the clamp brackets.

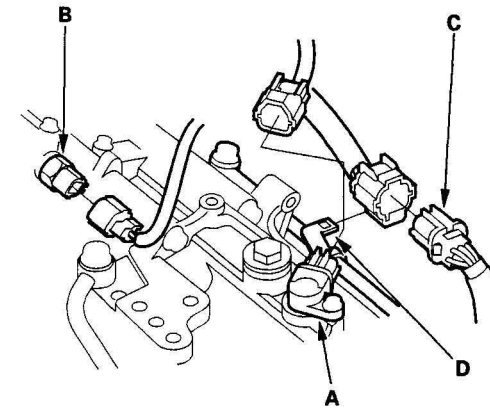


15. Disconnect the connector from the lock-up control solenoid valve/shift control solenoid valve A assembly (A), then remove the connector from the harness cover (B).



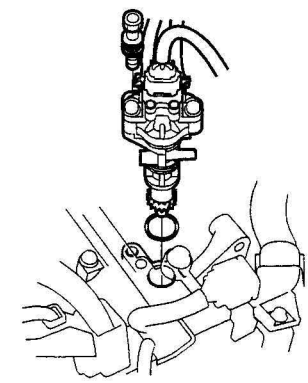
16. Remove the bolt securing the connector bracket (C), then push the harness cover rearward to remove it from the transmission hanger (D). Remove the ground terminal (E).

17. Disconnect the connectors from the countershaft speed sensor (A), and 2nd clutch pressure switch (B).



18. Remove the A/T gear position switch connector (C) from the connector bracket (D), then disconnect it.

19. Remove the vehicle speed sensor (VSS)/ power steering speed sensor. Do not disconnect the hoses.

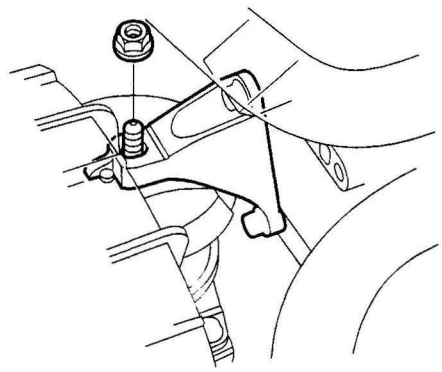


(cont'd)

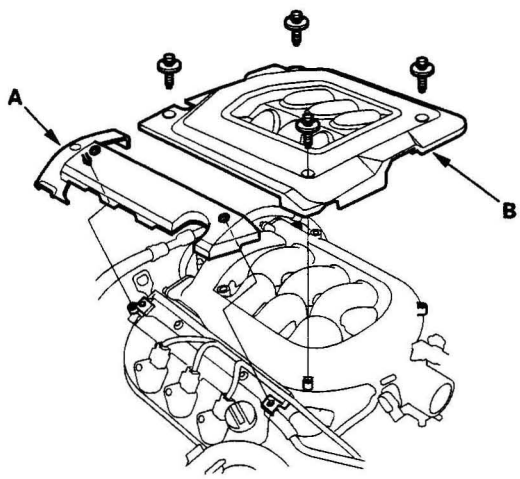
Protected by AR

Transmission Removal (cont'd)

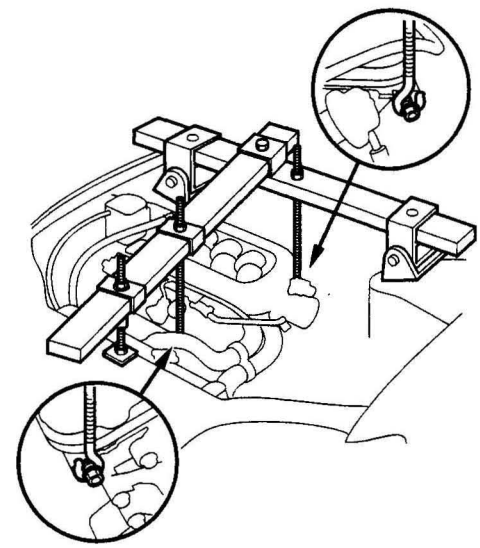
20. Remove the nut from the front mount.



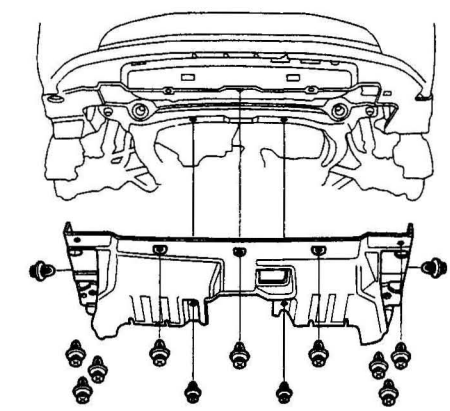
21. Remove the front engine cover (A) and rear engine cover (B).



22. Lift and support the engine/transmission assembly with an engine hanger (P/N AAR-T-12566, available through the American Honda Tool and Equipment program, or equivalent). Before attaching the hanger, remove the front bulkhead cover (see page 20-135), and the front strut support beam.



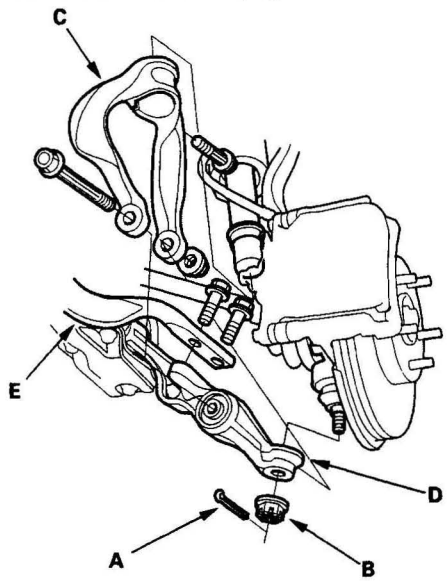
23. Remove the splash shield.



BACK

Protected by AR

24. Remove the cotter pins (A), castle nuts (B), and damper forks (C), then separate the ball joints from the lower arms (D) (see page 18-9).

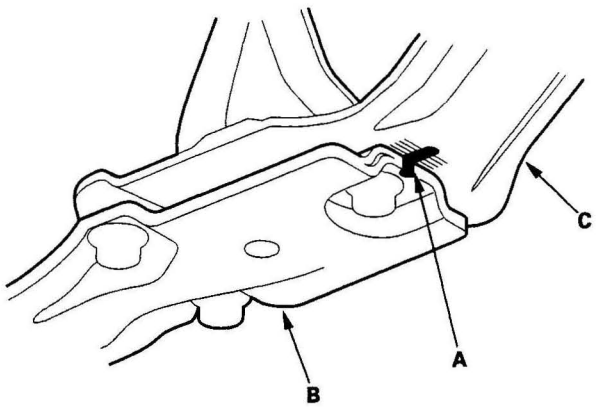


25. Remove the bolts securing the radius rods (E), then separate the radius rods from the lower arms (D).

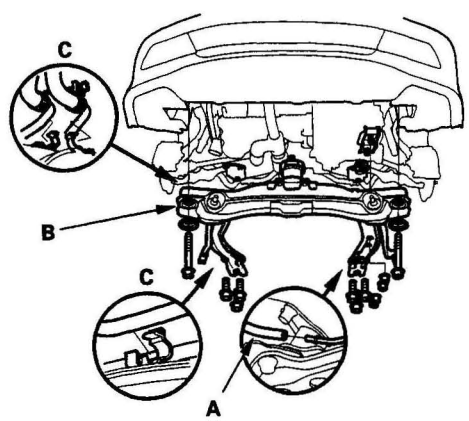
26. Pry the driveshafts out of the differential and the intermediate shaft (see step 10 on page 16-4).

27. Pull on the inboard joints to remove the left driveshaft from the differential and to remove the right driveshaft from the intermediate shaft.

28. Make a reference mark (A) across the front beam (B) and the rear beam (C).



29. Disconnect the vacuum tube (A) on the front beam (B), and unclamp the power steering fluid pipes (C) from the clamps on the front beam.



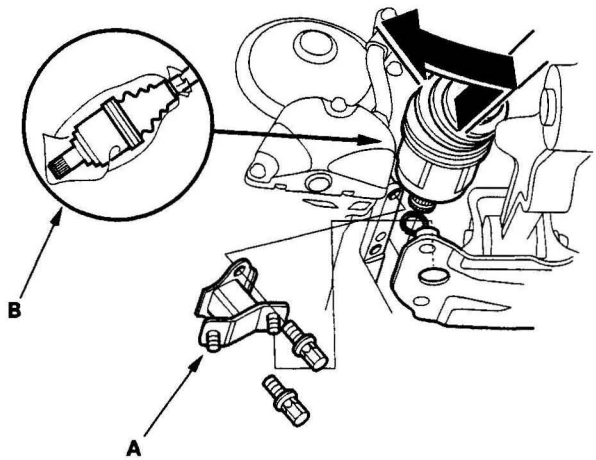
30. Remove the nuts securing the transmission lower mounts, then remove the front beam (B).

(cont'd)

Protected by AR

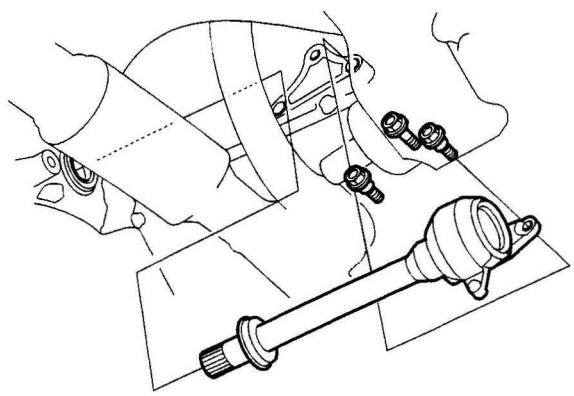
Transmission Removal (cont'd)

31. Remove the transmission lower rear mount (A) from the transmission.



32. Move the left driveshaft to the front side. Coat all precision finished surfaces with clean engine oil, then tie the plastic bags (B) over the driveshaft ends.

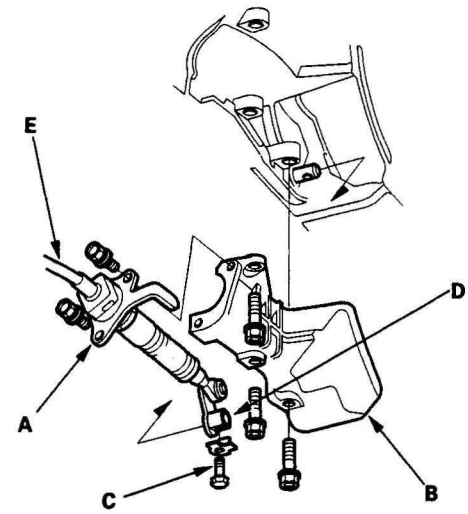
33. Remove the intermediate shaft.



34. Coat all precision finished surfaces with clean engine oil, then tie the plastic bags over the both ends of intermediate shaft.

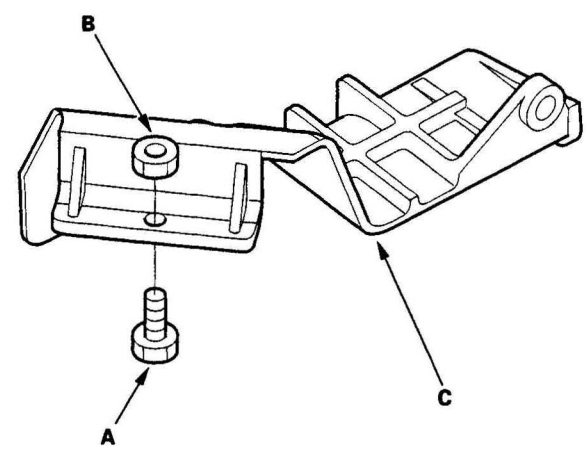
35. Remove the bolts securing shift cable holder (A), then remove shift cable cover (B).

NOTE: To prevent damage to the control lever joint, remove the bolts securing the holder before removing the bolts securing the cover.



36. Remove the lock bolt (C) securing the control lever (D), then remove the shift cable (E) with the control lever. Do not bend the shift cable excessively.

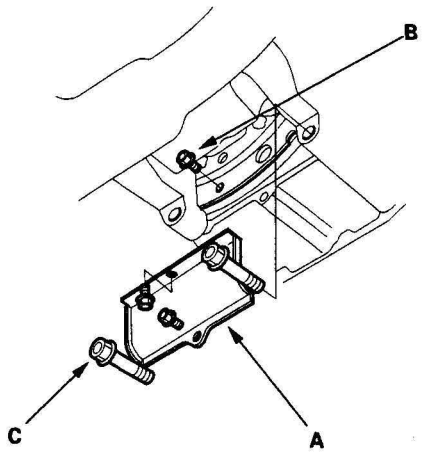
37. Install a 6 x 1.0 x 14 mm bolt (A) and nut (B) on the shift cable cover (C), then reinstall the shift cable cover to the torque converter housing.
If you don't do this, the bolt head of the cable cover may prevent you from removing the torque converter during transmission removal.



BACK

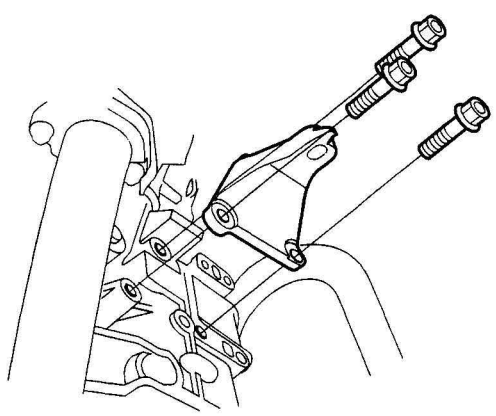
Protected by AR

38. Remove the torque converter cover (A), then remove the eight drive plate bolts (B) one at a time while rotating the crankshaft pulley.



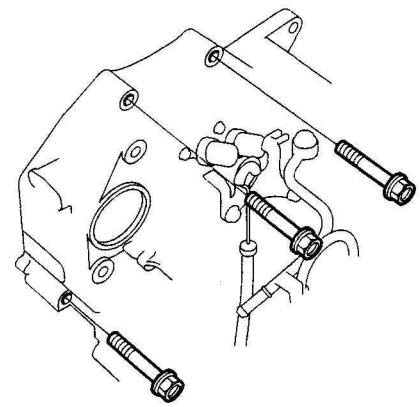
39. Remove the engine stiffener bolts (C).

40. Remove the front mount bracket.

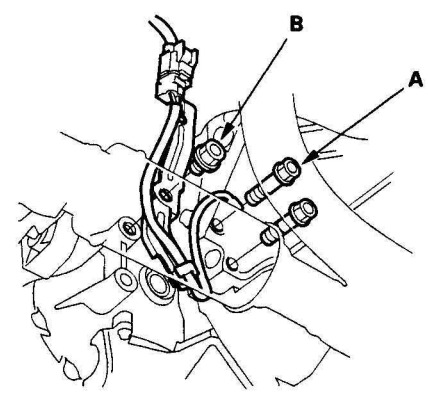


41. Place a jack under the transmission.

42. Remove the transmission housing mounting bolts.



43. Remove the remaining transmission housing mounting bolts (A) and the connector bracket bolt (B).



(cont'd)

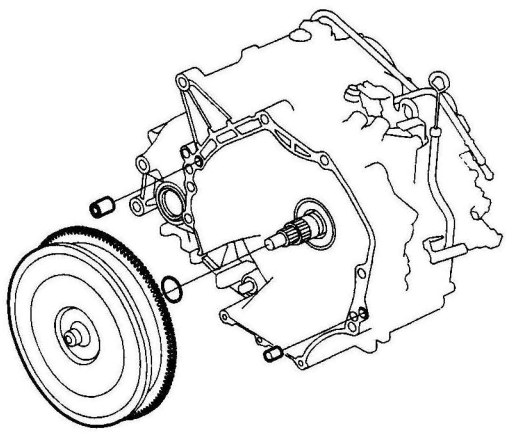
Protected by AR

Transmission Removal (cont'd)

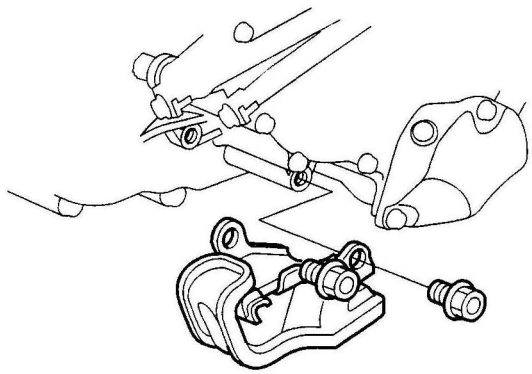
44. Pull the transmission away from the engine until it clears the dowel pins, then lower it on the transmission jack.

    NOTE: If the torque converter is stuck to the drive plate, pull it toward the transmission housing through the starter opening.

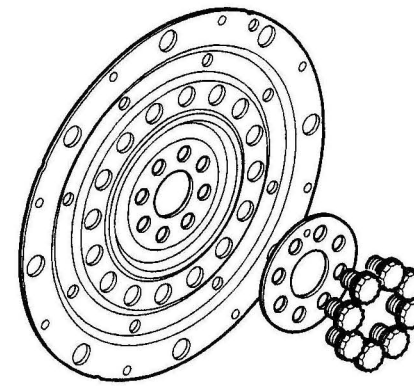
45. Remove the shift cable cover, then remove the torque converter assembly from the torque converter housing.



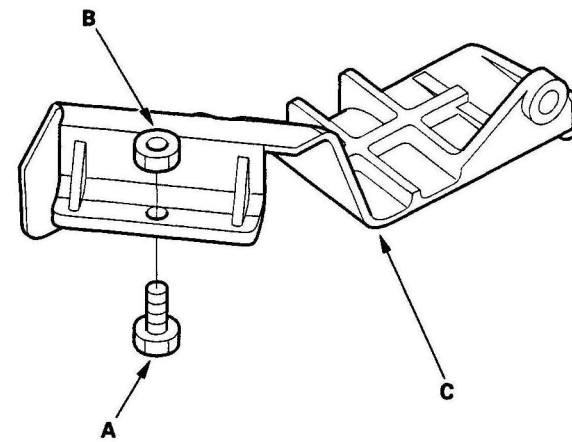
46. Remove the transmission lower front mount.



47. Inspect the drive plate, and replace it if it's damaged.



48. Remove the 6 x 1.0 x 14 mm bolt (A) and nut (B) from the shift cable cover (C).

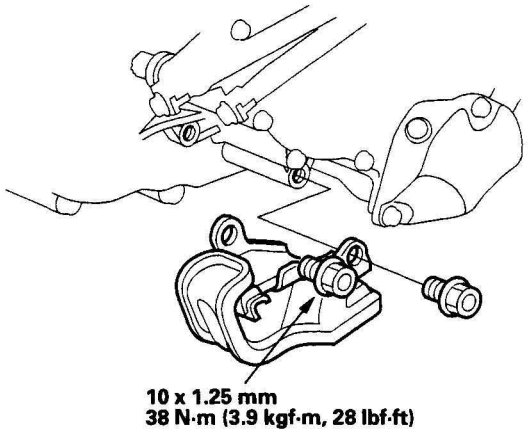


BACK

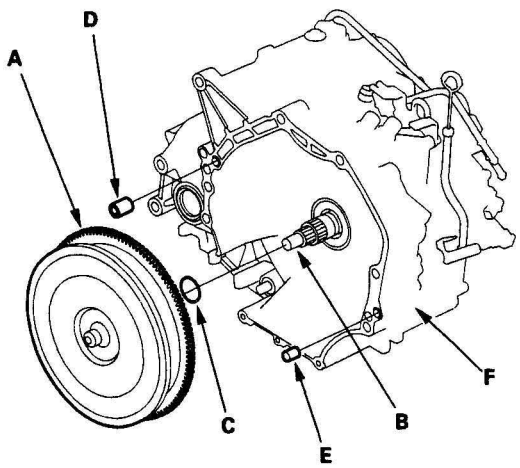
Protected by AR

Transmission Installation

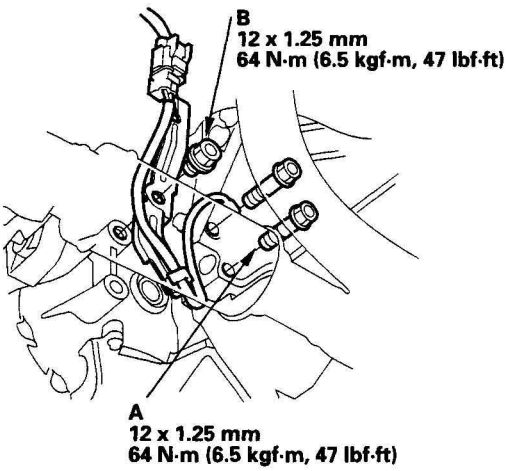
1. Flush the ATF cooler (see page 14-123).
2. Install the transmission lower front mount.



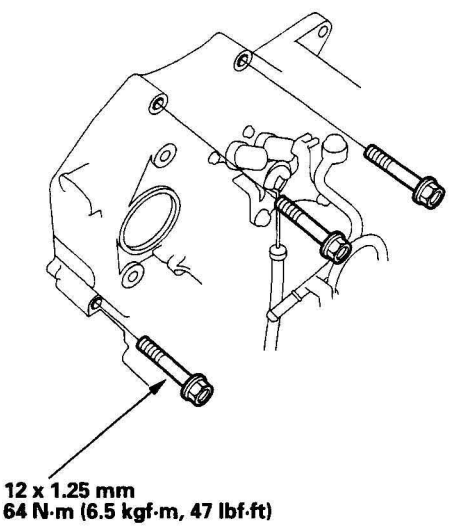
3. Install the torque converter assembly (A) on the mainshaft (B) with a new O-ring (C).



4. Install the 14 mm dowel pin (D) and 10 mm dowel pin (E) in the torque converter housing (F).
5. Place that transmission on a jack, and raise it to engine level.
6. Attach the transmission to the engine, then install the transmission housing mounting bolts (A) and connector bracket bolt (B).



7. Install the transmission housing mounting bolts.

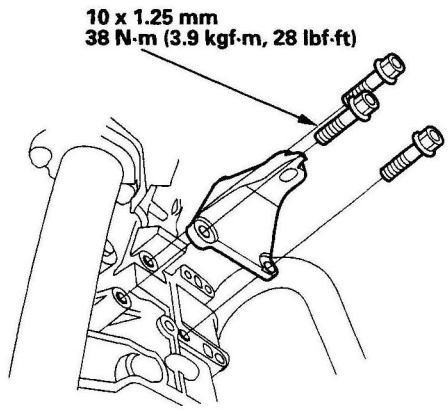


(cont'd)

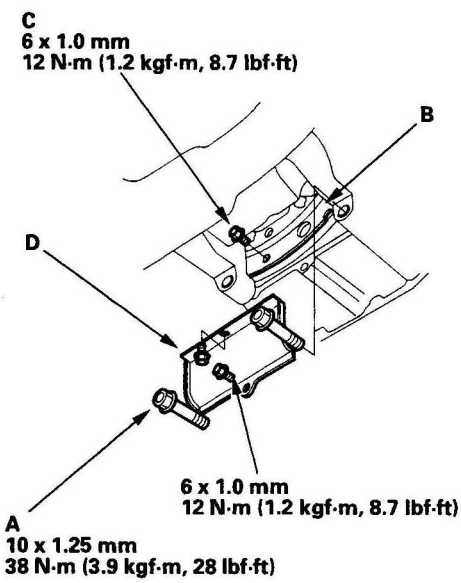
Protected by AR

Transmission Installation (cont'd)

8. Install the front mount bracket.



9. Install the engine stiffener mounting bolts (A).

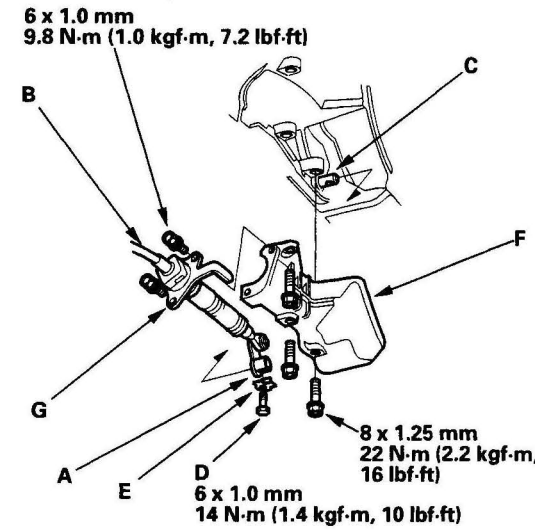


10. Attach the torque converter to the drive plate (B) with eight bolts (C). Rotate the crankshaft pulley as necessary to tighten the bolts to 1/2 of the specified torque, then to the final torque, in a crisscross pattern. After tightening the last bolt, check that the crankshaft rotates freely.

11. Install the torque converter cover (D).

12. Tighten the crankshaft pulley bolt as necessary (see step 2 on page 6-16).

13. Install the control lever (A) with the shift cable (B) on the control shaft (C). Do not bend the shift cable excessively.

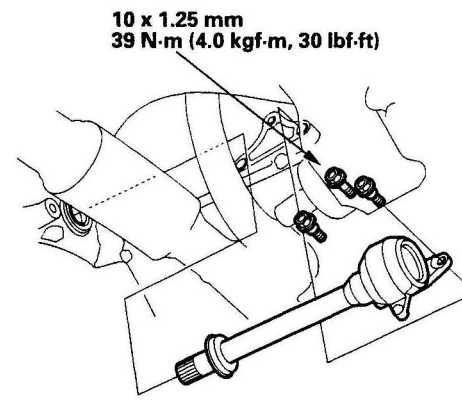


14. Install the lock bolt (D) with a new lock washer (E), then bend the lock washer tab against the bolt.

15. Install the shift cable cover (F), then install the shift cable holder (G) on the shift cable cover.

    NOTE: To prevent damage to the control lever joint, be sure to install the shift cable holder after installing the shift cable cover to the torque converter housing.

16. Clean the areas where the intermediate shaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air. Then install the intermediate shaft in the differential. While installing the intermediate shaft, be sure not to allow dust or other foreign particles to enter the transmission.



BACK

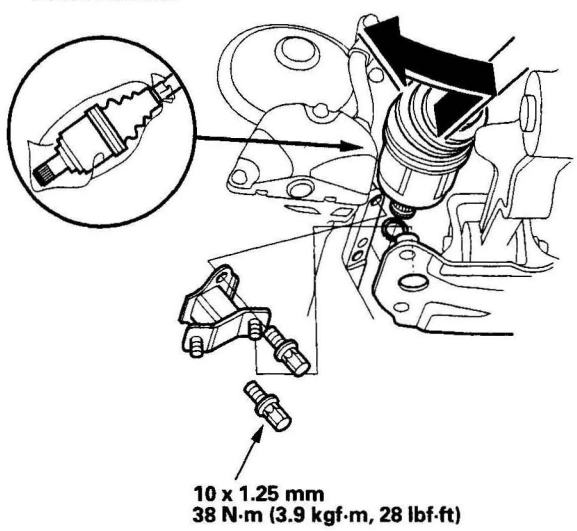
Protected by AR

17. Install new set rings on the right and left driveshafts.

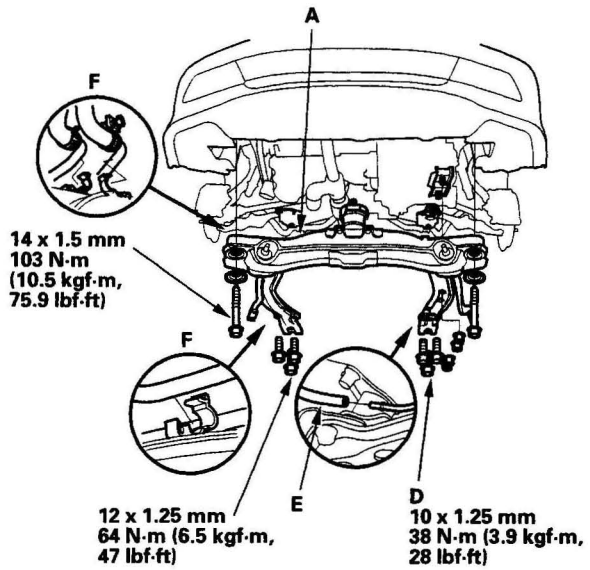
18. Install the right and left driveshaft (see page 16-19). While installing the left driveshaft in the differential, be sure not to allow dust or other foreign particles to enter the transmission.

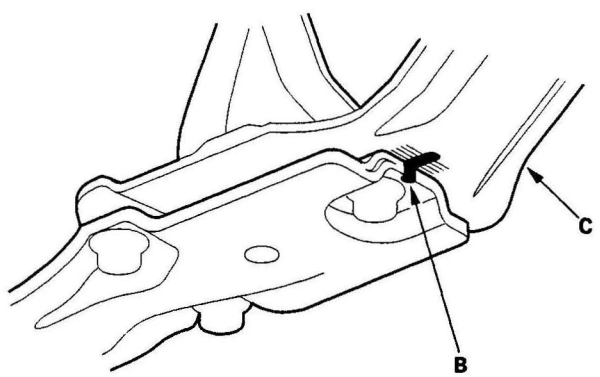
    NOTE:
    - Clean the areas where the left driveshaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air.
    - Turn the right and left steering knuckle fully outward, and slide the left driveshaft into the differential until you feel its spring clip engage the side gear. Slide the right driveshaft into the intermediate shaft until you feel its spring clip engage the intermediate shaft.

19. Install the transmission lower rear mount on the transmission.



20. Install the front beam (A) by aligning both reference marks (B) on both rear beams (C), and tighten the bolts.





21. Install the transmission lower mount nuts (D).

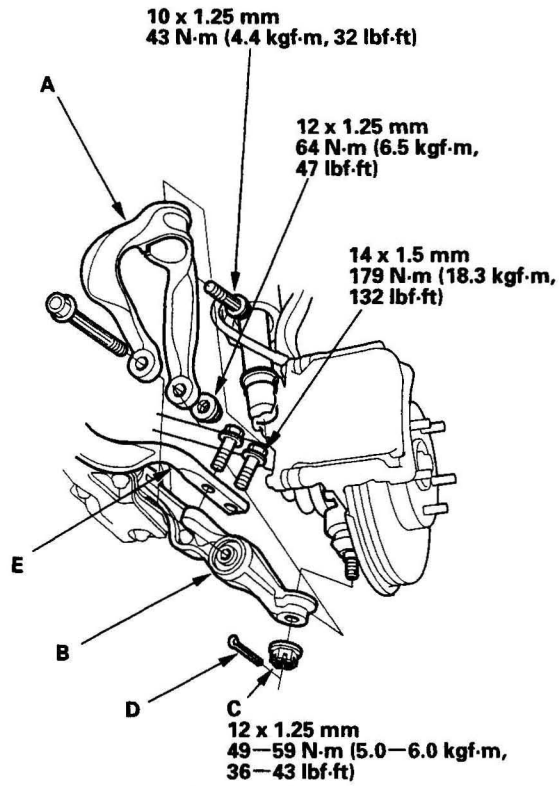
22. Connect the vacuum tube (E), and install the power steering fluid pipes (F) on its clamps.

(cont'd)

Protected by AR

Transmission Installation (cont'd)

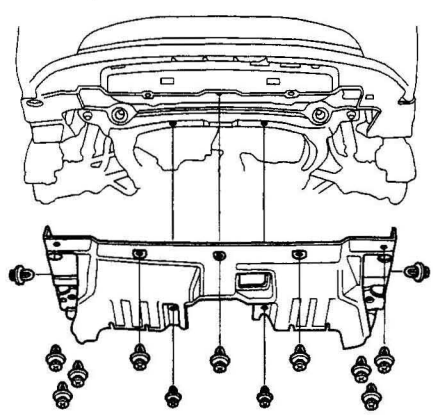
23. Install the damper forks (A), then install the ball joints on each lower arm (B) with the castle nuts (C) and new cotter pins (D).



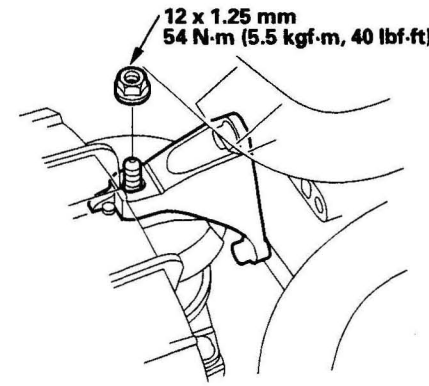
24. Install the radius rods (E) on each lower arm.

25. Remove the jack from the transmission.

26. Install the splash shield.

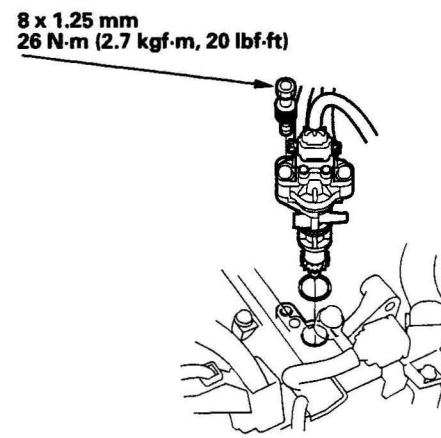


27. Install and tighten the nut on the front mount.



28. Remove the engine hanger from the engine.

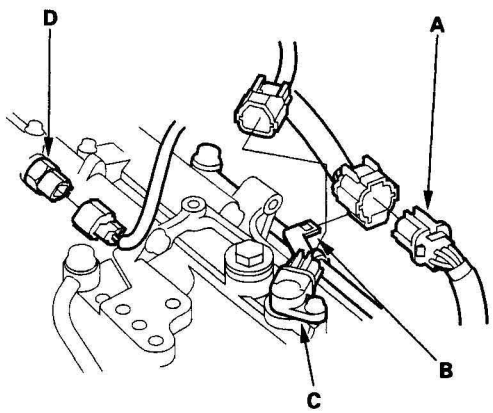
29. Install the vehicle speed sensor (VSS)/power steering speed sensor.



BACK

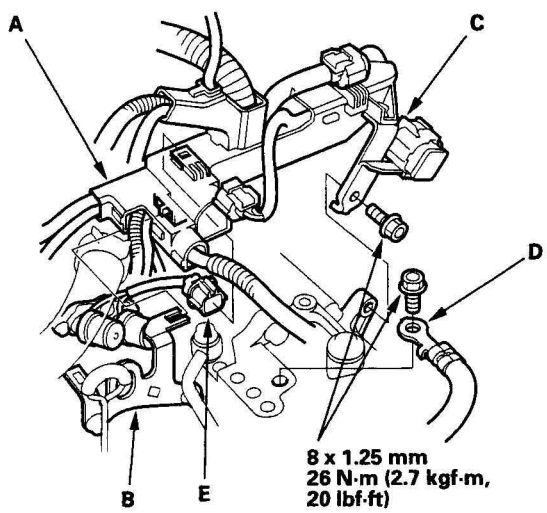
Protected by AR

30. Connect the A/T gear position switch connector (A), then install it on its connector bracket (B).



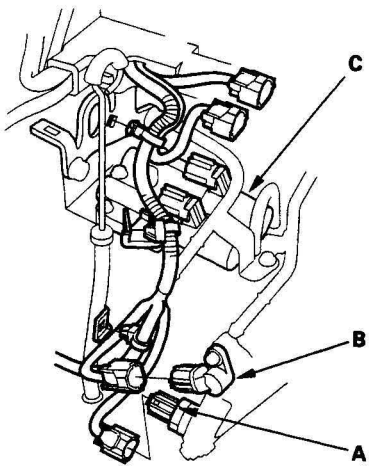
31. Connect the connectors to the countershaft speed sensor (C), and 2nd clutch pressure switch (D). Do not allow water, fluid, oil, dust, or other foreign particles to enter the 2nd clutch pressure switch connector.

32. Install the harness cover (A) on the transmission hanger (B), then install the connector bracket (C) and the transmission ground cable terminal (D).

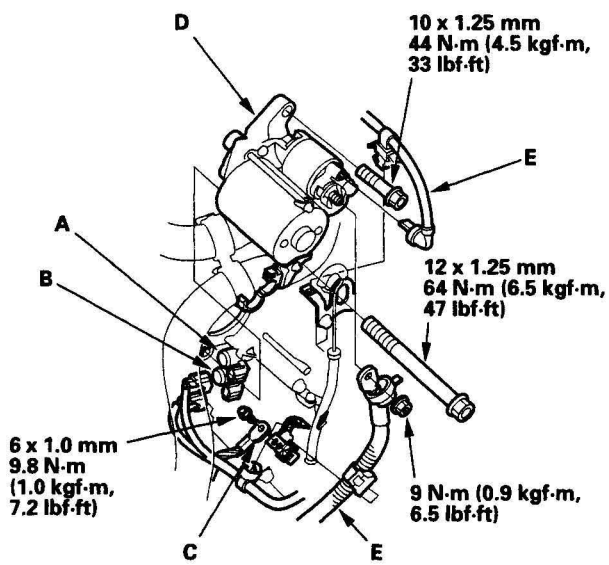


33. Install the lock-up control solenoid valve/shift control solenoid valve A assembly connector (E) on the harness cover, then connect the connector.

34. Connect the connectors to the 3rd clutch pressure switch (A), mainshaft speed sensor (B), and A/T clutch pressure control solenoid valves A and B (C), then install the clamps on the clamp brackets. Do not allow water, fluid, oil, dust, or other foreign particles to enter the 3rd clutch pressure switch connector.



35. Connect the connectors to the shift control solenoid valve B (A) and shift control solenoid valve C (B), then install the clamp on the clamp bracket.



36. Install the transmission ground cable terminal (C).

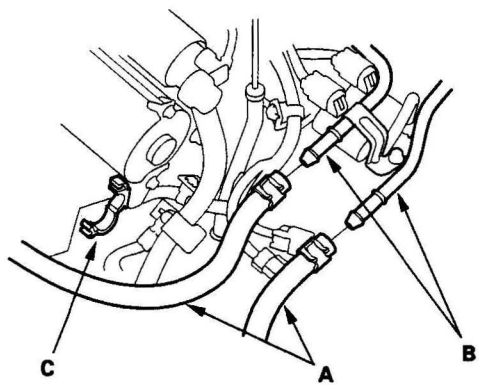
(cont'd)

Protected by AR

Transmission Installation (cont'd)

37. Install the starter (D) on the torque converter housing. Connect the starter cables (E) to the starter, and install the harness clamp on the clamp bracket. Make sure the crimped side of the starter cable ring terminal is facing out.

38. Connect the ATF cooler hoses (A) to the ATF cooler lines (B). Clamp the ATF cooler hose with the clamp (C) on the starter.



39. Install the battery base bracket and battery base.

40. Install the battery cable clamps on the battery base.

41. Install the battery tray and battery, then secure the battery with its hold-down bracket.

42. Install the intake air duct.

43. Install the rear engine cover and the front engine cover.

44. Install the front strut support beam (Torque 22 N·m, 2.2 kgf·m, 22 lbf·ft), and the front bulkhead cover (see page 20-135).

45. Refill the transmission with ATF (see page 14-109).

46. Connect the battery positive terminal, then connect the negative terminal.

47. Set the parking brake. Start the engine, and shift the transmission through all gears three times.

48. Check the shift lever operation, A/T gear position indicator operation, and shift cable adjustment.

49. Check and adjust the front wheel alignment (see page 18-5).

50. Reattach the right and left hood support struts.

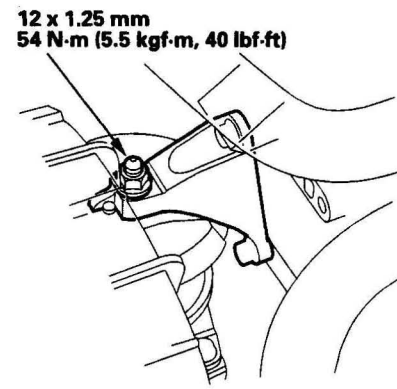
51. Let the engine reach normal operating temperature (the radiator fan comes on) with the transmission in the P or N position, and continue to run the engine at idle for more than 5 minutes to calibrate the engine idle control system in the PCM (see page 11-158).

52. Turn the engine off and check the ATF level (see page 14-108).

53. Perform a road test (see page 14-97).

54. Enter the anti-theft code for the radio, then enter the radio station presets, and set the clock.

55. Loosen the front mount nut after the road test, then retighten the nut to the specified torque.



BACK

Protected by AR

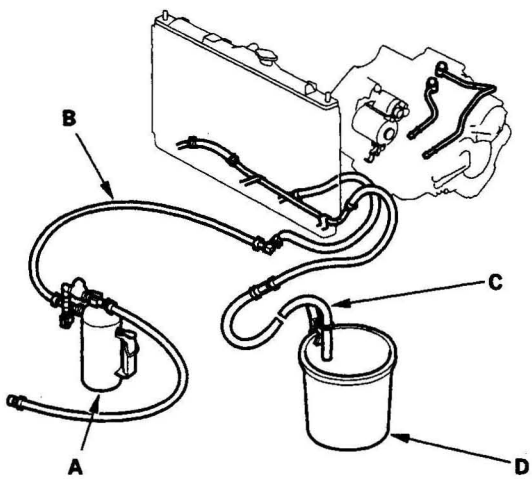
ATF Cooler Flushing

Special Tools Required
Commercially Available Transmission Cooler Flusher
Kent-Moore J38405-A or equivalent

This procedure should be performed before reinstalling the transmission.

1. Check equipment for wear and cracks before using. Replace any worn or cracked components.

2. Using the measuring cup, fill the flusher (A) with 21 ounces (approximately 2/3 full) of biodegradable flushing fluid (J35944-20). Do not substitute with any other fluid. Follow the handling procedure on the fluid container.



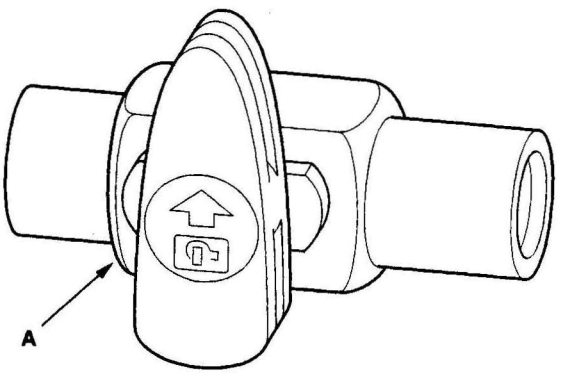
3. Secure the flusher filler cap, and pressurize the flusher with compressed air to 550—829 kpa (5.6—8.45 kgf/cm², 80—120 psi). The air line should be equipped with a water trap to ensure a dry air system.

4. Hang the flusher under the vehicle.

5. Attach the flusher discharge hose (B) to the return line of the ATF cooler using a clamp.

6. Connect the drain hose (C) to the inlet line on the ATF cooler using a clamp. Securely clamp the opposite end of the drain hose to a bucket (D) or floor drain.

7. With the water and air valves (A) off, attach the water and air supplies to the flusher. (Hot water if available.)



8. Turn on the water valve for 10 seconds. If water does not flow through the cooler, it is completely plugged, cannot be flushed, and must be replaced.

9. Depress the trigger to mix the flushing fluid into the water flow. Use the wire clip to hold the trigger down.

10. While flushing with the water and flushing fluid for 2 minutes, turn the air valve on for 5 seconds every 15—20 seconds to create a surging action.

    AIR PRESSURE: MAX 845 kPa (8.45 kgf/cm², 120 psi)

11. Turn the water valve off. Release the trigger, then reverse the hoses to the cooler so you can flush in the opposite direction. Repeat steps 8 through 10.

12. Release the trigger, and rinse the cooler with water for 1 minute.

13. Turn the water valve off and the water supply off.

14. Turn the air valve on for 2 minutes, or until no moisture is visible leaving the drain hose. Residual moisture in the cooler or lines can damage the transmission.

15. Remove the flusher from the cooler line. Attach the drain hose to an ATF container.

16. Install the transmission, and leave the drain hose attached to the cooler line.

(cont'd)

Protected by AR

ATF Cooler Flushing (cont'd)

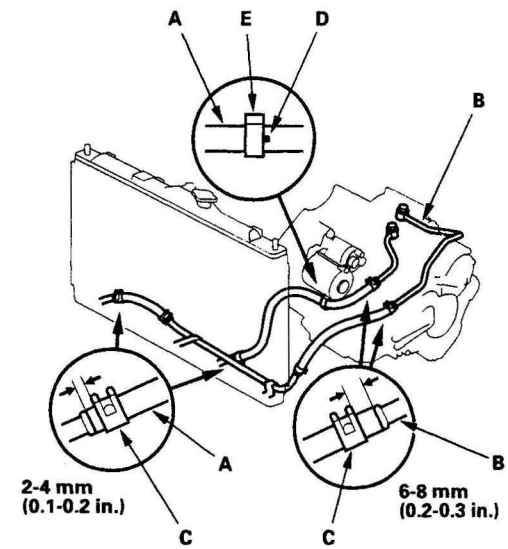
17. Make sure the transmission is in the [P] position. Fill the transmission with ATF, and run the engine for 30 seconds or until approximately 0.95ℓ (1.0 US qt.) is discharged.

18. Remove the drain hose, and reconnect the cooler return hose to the transmission.

19. Refill the transmission with ATF to the proper level (see page 14-109).

ATF Cooler Hoses Replacement

1. Connect the cooler hoses (A) to the lines (B) and the ATF cooler, and secure them with the clips (C).



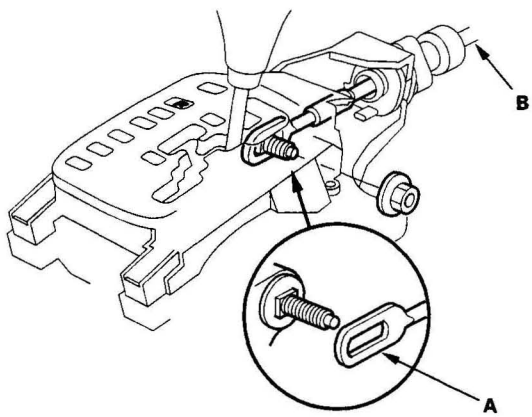
2. Clamp the ATF cooler hose with the yellow mark (D) on the clamp (E).

BACK

Protected by AR

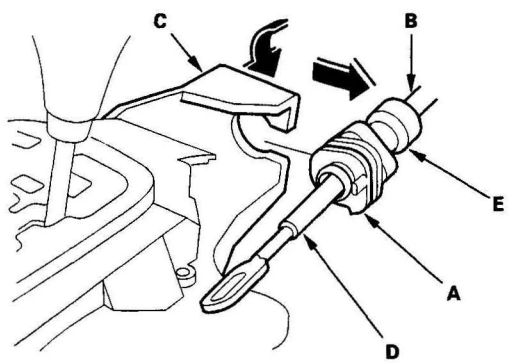
Shift Lever Removal

1. Shift the transmission into the [R] position.
2. Remove the console panel (see page 20-63).
3. Remove the nut securing the shift cable end (A), then separate the end from the shift lever assembly.

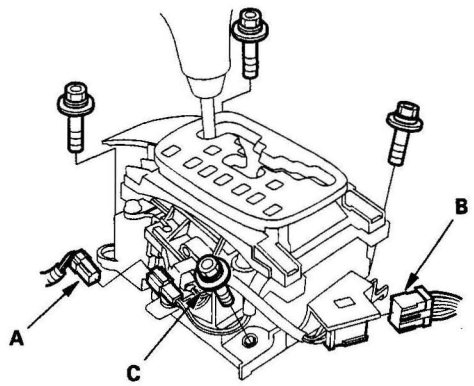


4. Rotate the socket holder (A) on the shift cable (B) counterclockwise a quarter turn, then slide the holder to remove the shift cable from the shift lever bracket base (C).

   NOTE: Do not remove the shift cable by twisting the shift cable guide (D) and damper (E).



5. Disconnect the shift lock solenoid connector (A) and the A/T shift switch connector (B).



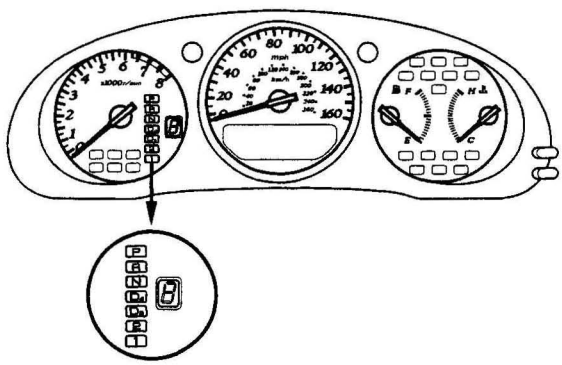
6. Remove the four bolts (C) securing the shift lever bracket base, then remove the shift lever assembly.

BACK

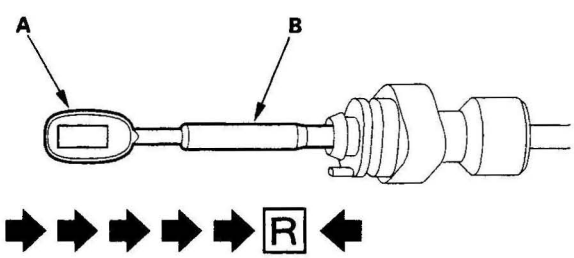
Protected by AR

Shift Lever Installation

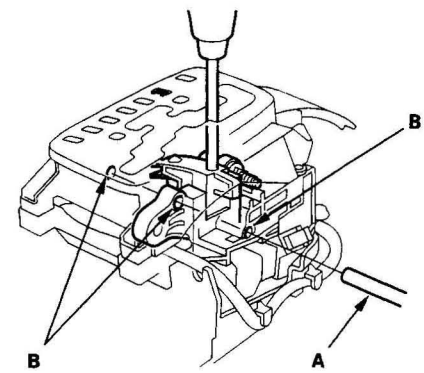
1. Install the shift lever assembly.
2. Turn the ignition switch ON (II), and verify that the R position indicator comes on.



3. If necessary, push the shift cable (A) until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in R. Do not hold the shift cable guide (B) to adjust the shift position.

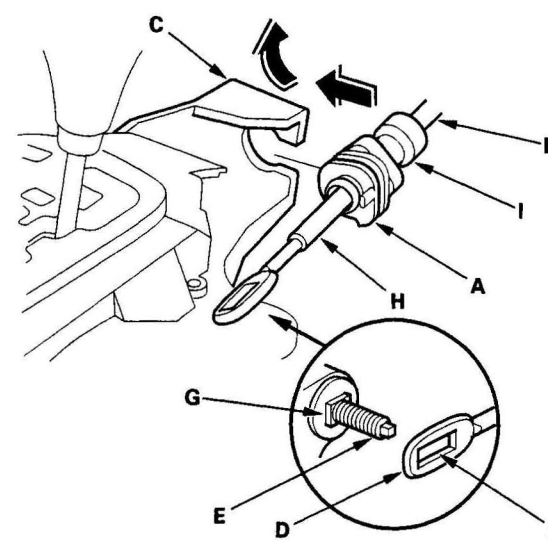


4. Turn the ignition switch OFF.
5. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole on the shift lever assembly. The shift lever is secured in the R position.



6. Rotate the socket holder (A) on the shift cable (B) toward the shift lever a quarter turn, then slide the holder into the shift lever bracket base (C). Install the shift cable end (D) over the mounting stud (E) by aligning its square hole (F) with the square fitting (G) at the bottom of the stud, and rotate the holder back a quarter turn to secure the shift cable.

NOTE: Do not install the shift cable by twisting the shift cable guide (H) and damper (I).

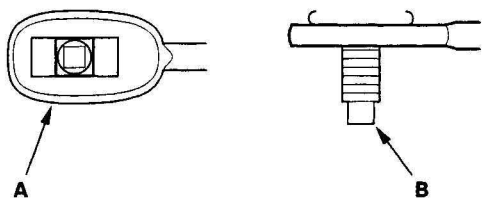


BACK

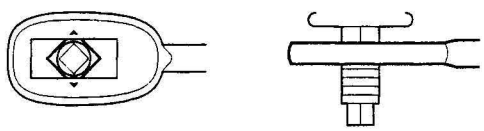
Protected by AR

7. Verify that the shift cable end (A) is properly installed on the mounting stud (B).

Properly Installed:



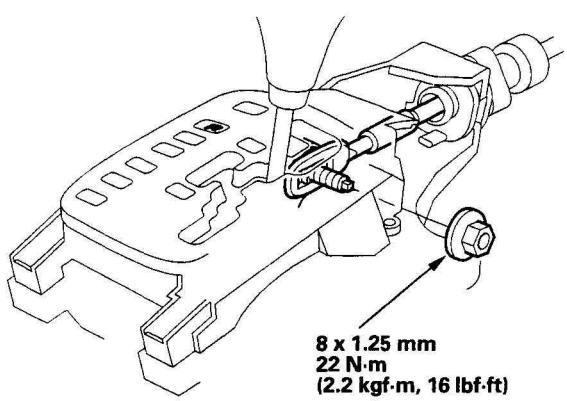
Improperly Installed:



Cable end rides on the bottom of the mounting stud.

8. If improperly installed, remove the shift cable from the shift lever bracket base, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the shift cable bracket base.

9. Install and tighten the nut.



10. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

11. Connect the shift lock solenoid connector and the A/T shift switch connector.

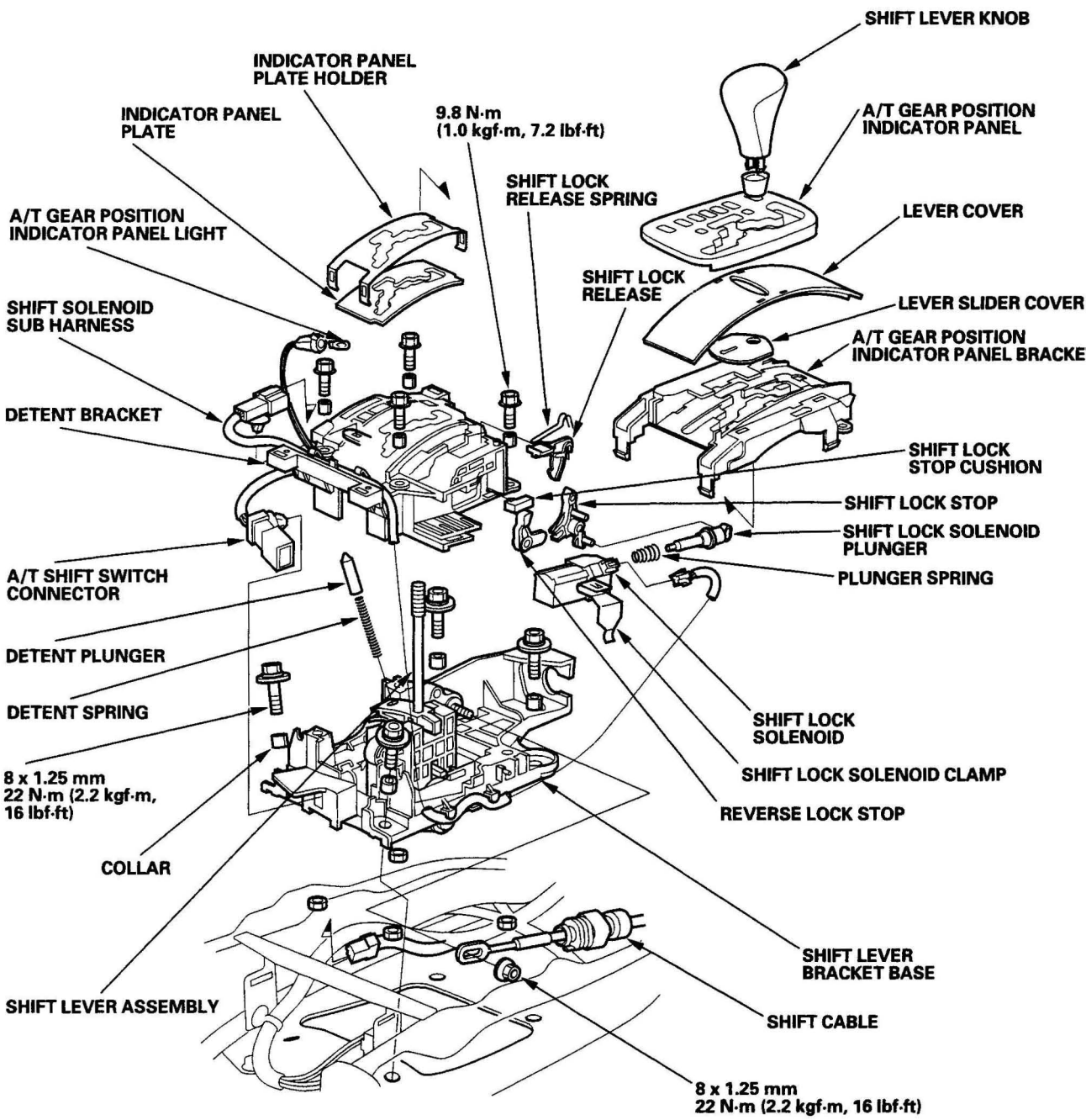
12. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the A/T gear position switch.

13. Push the shift lock release, and verify that the shift lever releases.

Protected by AR

Shift Lever Disassembly/Reassembly

Apply silicone grease to these parts:
- Movable parts of the shift lever.
- Movable parts of the shift lock/reverse lock mechanism.
- Sliding surfaces on the opening of the indicator panel and panel holder.
- Sliding surfaces on the detent plate.
- Contact surfaces between of the shift lever assembly and the shift lock stop.
- Detent plunger and detent spring.

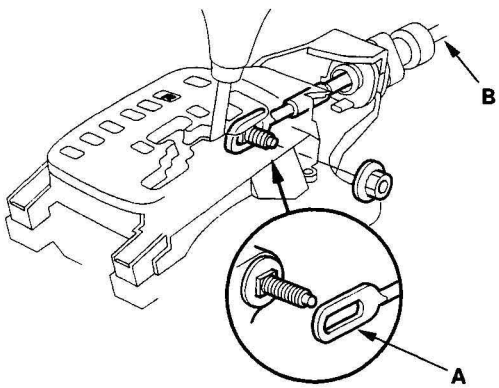


BACK

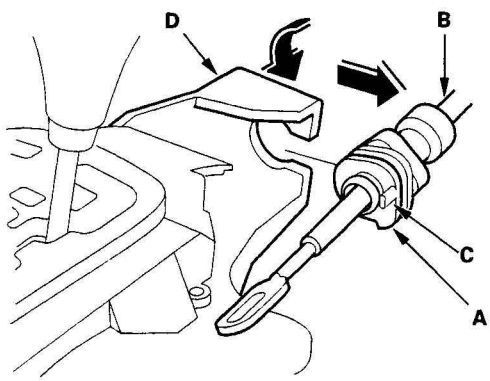
Protected by AR

Shift Cable Replacement

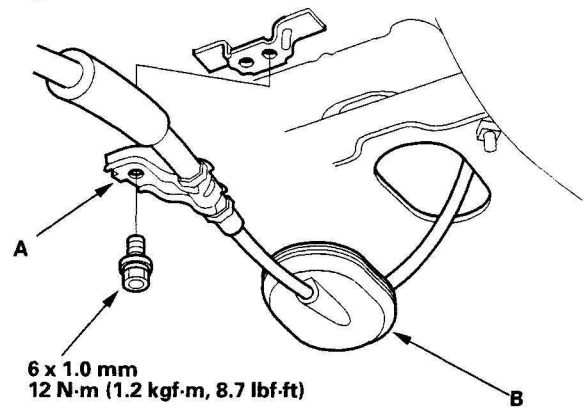
1. Raise the front of the vehicle, and make sure it is securely supported (see page 1-14).
2. Set the parking brake, and block rear wheels securely.
3. Shift the transmission into the R position.
4. Remove the console panel (see page 20-63).
5. Remove the nut securing the shift cable end (A), then separate the end from the shift lever assembly.



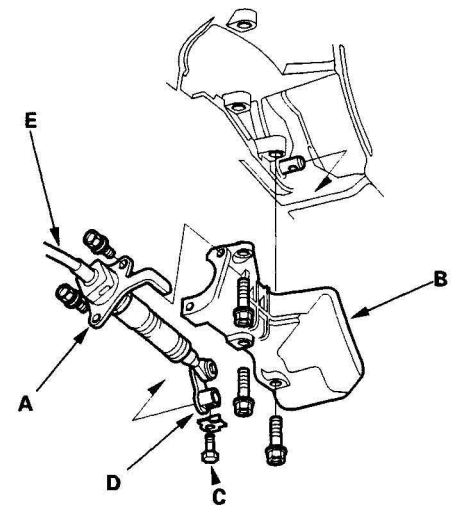
6. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening of the shift lever bracket base (D). Then slide the holder to remove the shift cable from the shift lever bracket base (D).



7. Remove the floor heat shield.
8. Remove the shift cable guide bracket (A) and grommet (B).



9. Remove the bolts securing the shift cable holder (A), then remove the shift cable cover (B).



10. Remove the lock bolt (C) securing the control lever (D), then remove the shift cable (E) with the control lever.

(cont'd)

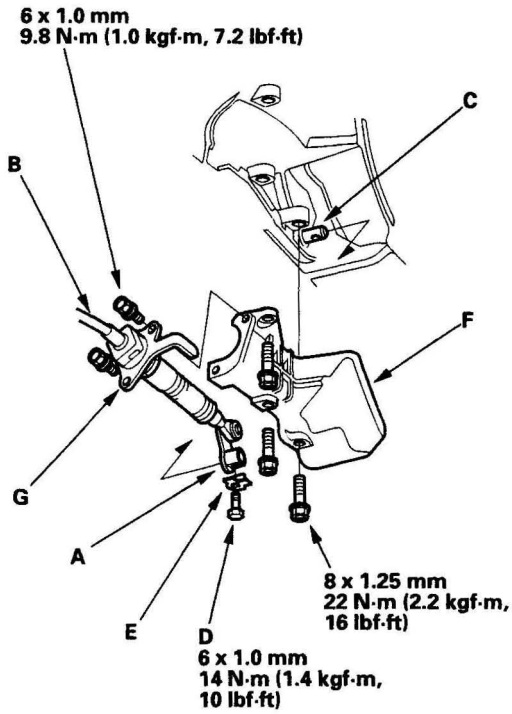
Protected by AR

Shift Cable Replacement (cont'd)

11. Insert the new shift cable through the grommet hole, then install the shift cable guide bracket.

12. Verify that the transmission is in the Ⓡ position on the control shaft.

13. Install the control lever (A) with the shift cable (B) on the control shaft (C). Do not bend the shift cable excessively.



14. Install the lock bolt (D) with a new lock washer (E), then bend the lock washer tab against the bolt.

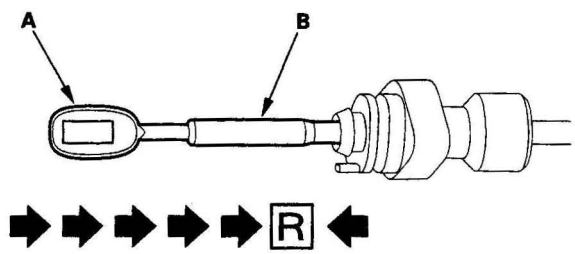
15. Install the shift cable cover (F), then install the shift cable holder (G) on the cover.

    NOTE: To prevent damage to the control lever joint, be sure to install the shift cable holder after installing the shift cable cover to the torque converter housing.

16. Install the floor heat shield.

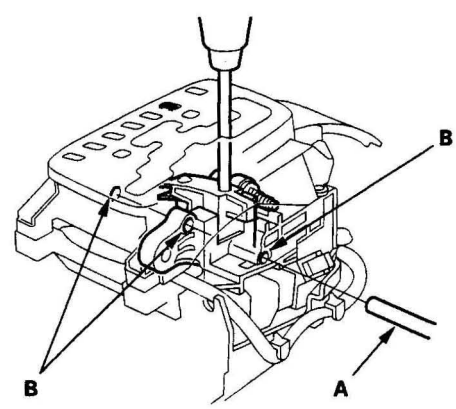
17. Turn the ignition switch ON (II), and verify that the Ⓡ position indicator comes on.

18. If necessary, push the shift cable (A) until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in Ⓡ. Do not hold the shift cable guide (B) to adjust the shift position.



19. Turn the ignition switch OFF.

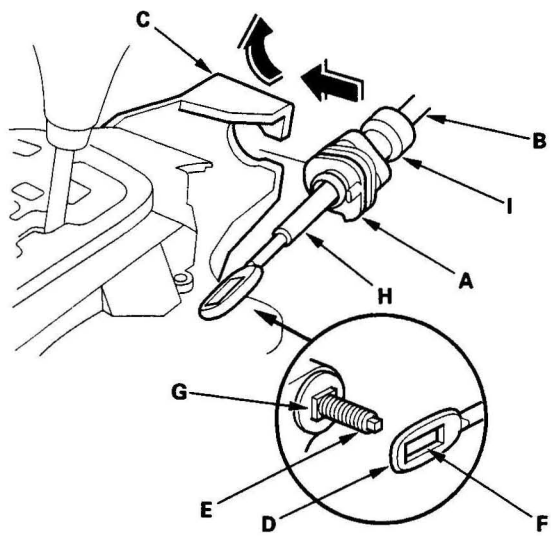
20. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole on the shift lever assembly. The shift lever is secured in the Ⓡ position.



BACK

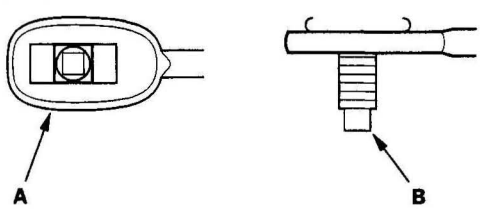
Protected by AR

21. Align the socket holder (A) on the shift cable (B) with the slot in the bracket base (C), then slide the holder into the base. Install the shift cable end (D) over the mounting stud (E) by aligning its square hole (F) with the square fitting (G) at the bottom of the stud. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (H) and damper (I).

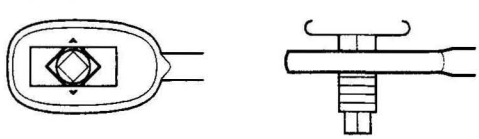


22. Verify that the shift cable end (A) is properly installed on the mounting stud (B).

Properly Installed:



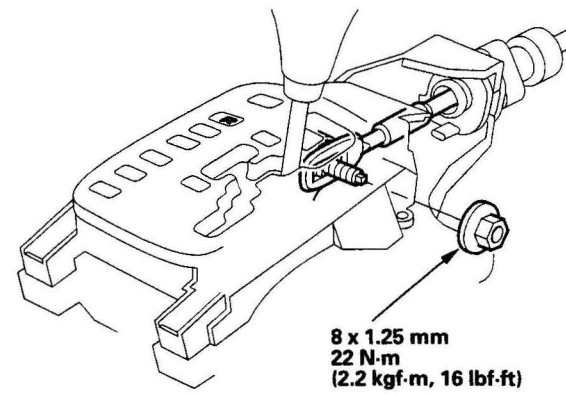
Improperly Installed:



Cable end rides on the bottom of the mounting stud.

23. If improperly installed, remove the shift cable from the shift lever bracket base, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the shift cable bracket base.

24. Install and tighten the nut.



25. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

26. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the A/T gear position switch.

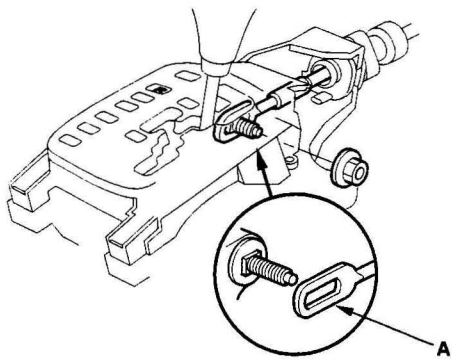
27. Start the engine, and check the shift lever operation in all gears.

BACK

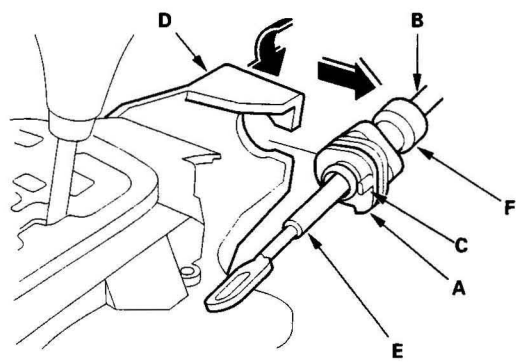
Protected by AR

Shift Cable Adjustment

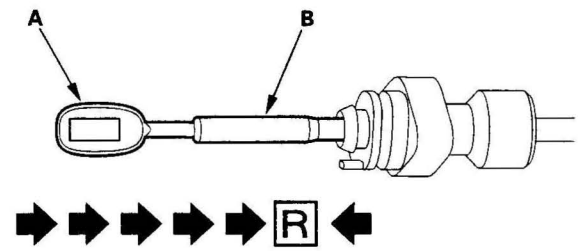
1. Shift the transmission into the R position.
2. Remove the console panel (see page 20-63).
3. Remove the nut securing the shift cable end (A), then separate the end from the shift lever assembly.



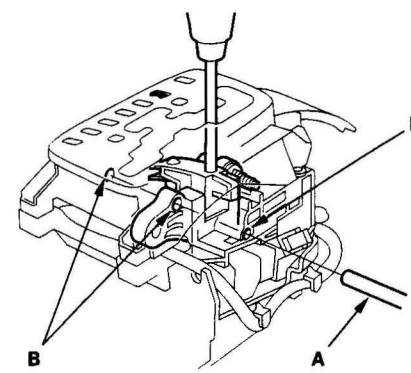
4. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the soclet holder will be in the opening of the shift lever bracket base (D). Then slide the holder to remove the shift cable from the shift lever bracket base(D). Do not remove the shift cable by twistinf the shift cable guide (E) and damper (F).



5. Push the shift cable (A) until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in R. Do not push and pull the shift cable by holding the shift cable guide (B).



6. Turn the ignition switch ON (II), and verify that the R position indicator comes on.
7. Turn the ignition switch OFF.
8. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole on the shift lever assembly. The shift lever is secured in the R position.

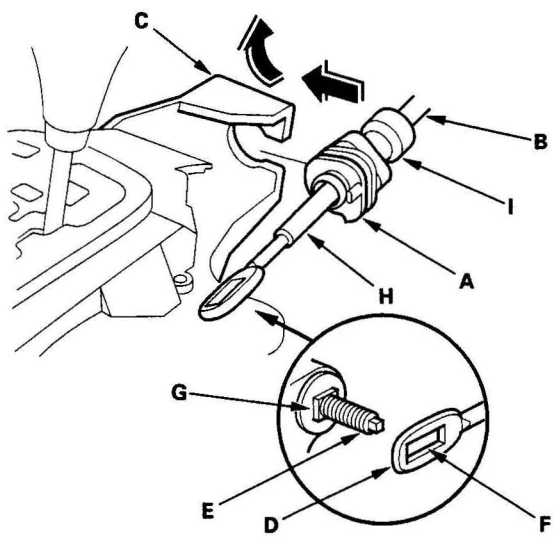


BACK

Protected by AR

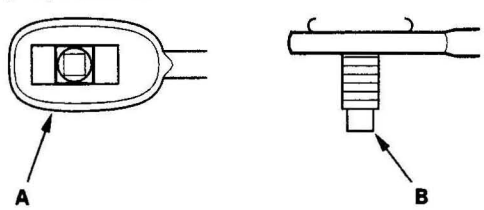
9. Rotate the socket holder (A) on the shift cable (B) toward the shift lever a quarter turn, then slide the holder into the shift lever bracket base (C). Install the shift cable end (D) over the mounting stud (E) by aligning its square hole (F) with the square fitting (G) at the bottom of the stud, and rotate the holder back a quarter turn to secure the shift cable.

   NOTE: Do not install the shift cable by twisting the shift cable guide (H) and damper (I).

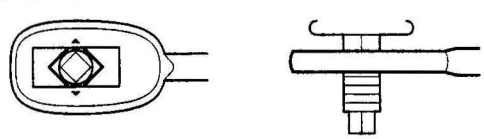


10. Verify that the shift cable end (A) is properly installed on the mounting stud (B).

Properly installed:



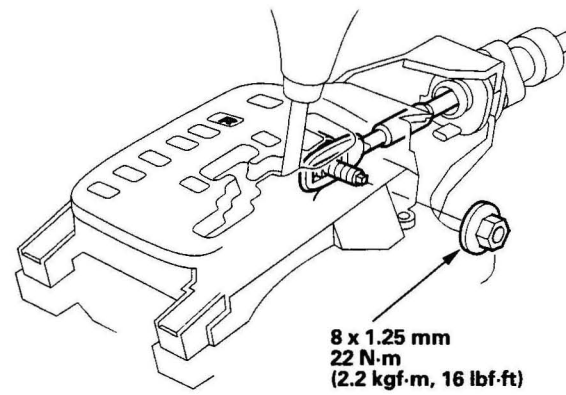
Improperly installed:



Cable end rides on the bottom of the mounting stud.

11. If improperly installed, remove the shift cable from the shift lever bracket base, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the shift cable bracket base.

12. Install and tighten the nut.



13. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

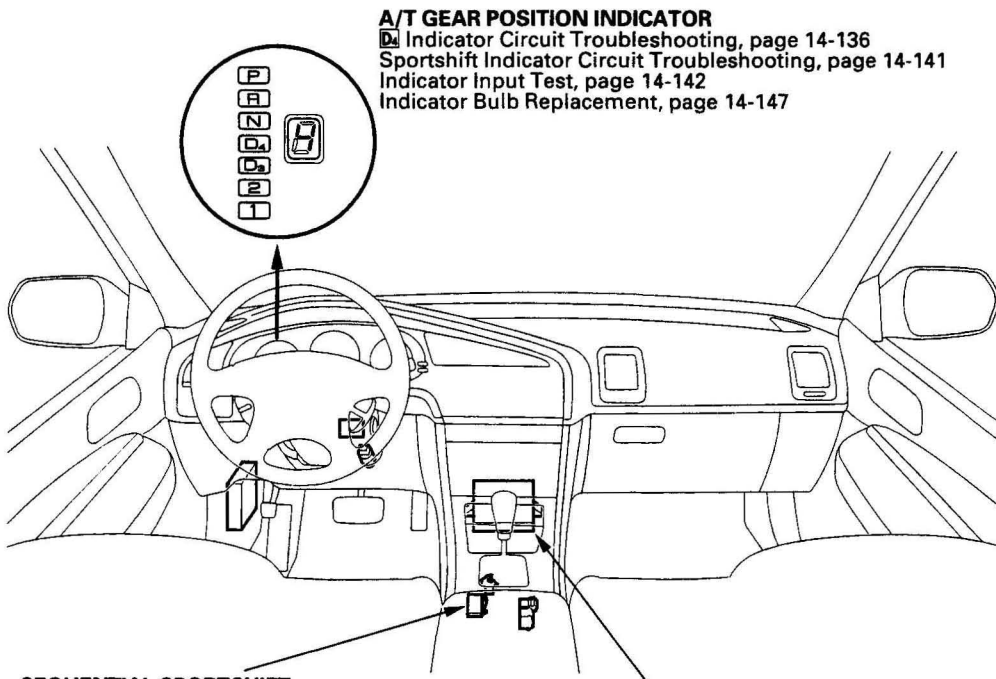
14. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the A/T gear position switch.

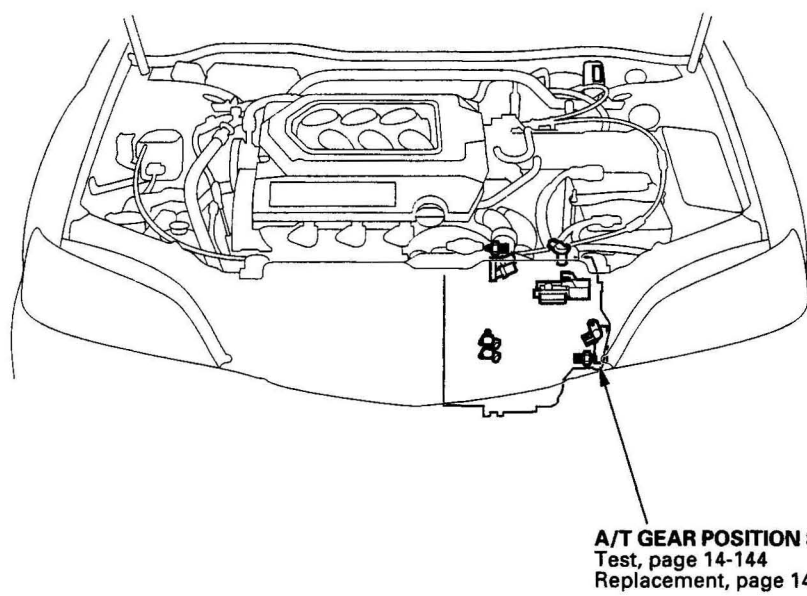
15. Push the shift lock release, and verify that the shift lever releases.

Protected by AR

A/T Gear Position Indicator

Component Location Index

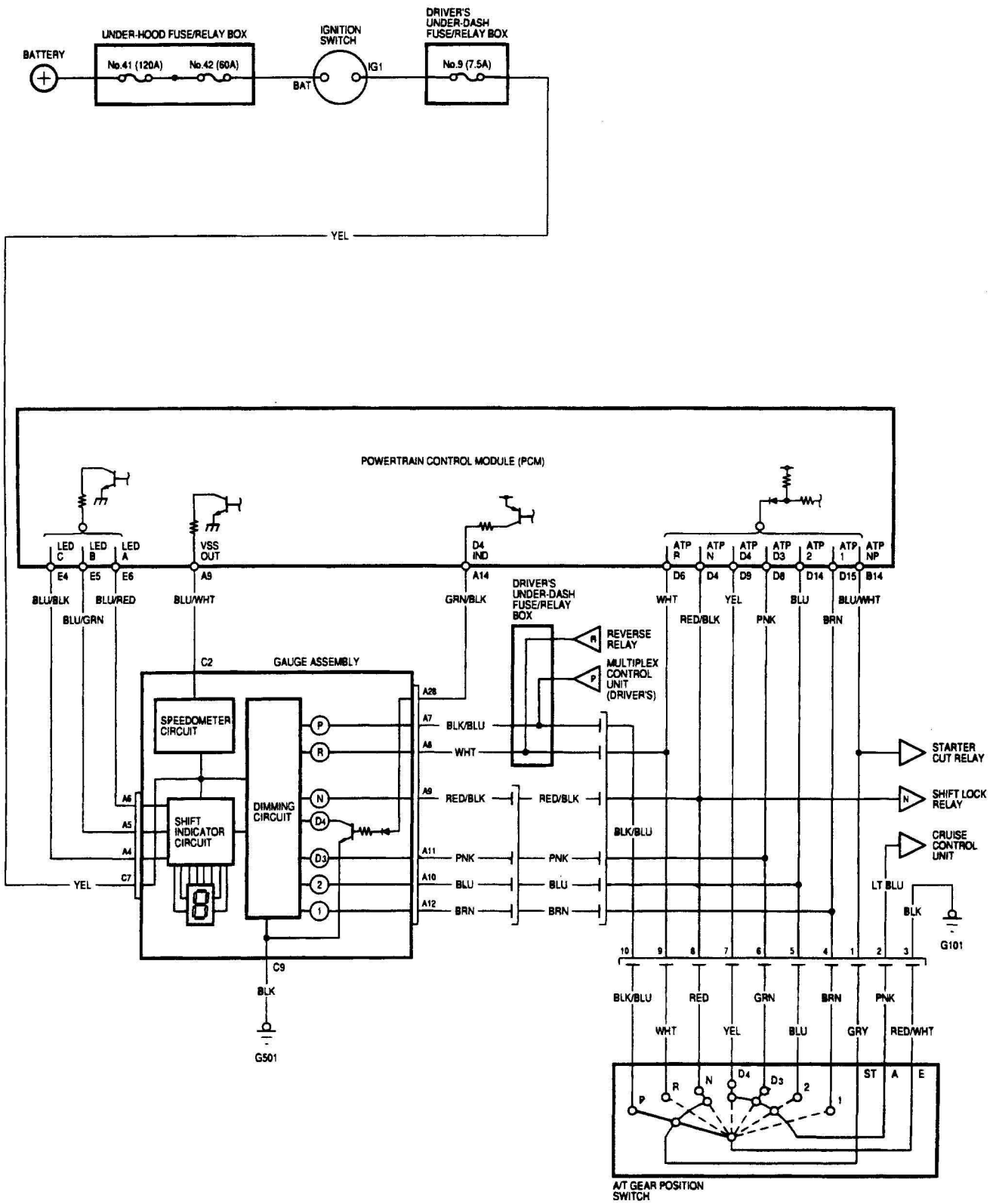




BACK

Protected by AR

Circuit Diagram



BACK

Protected by AR

D4 Indicator Circuit Troubleshooting

1. Turn the ignition switch ON (II), and watch the D4 indicator.

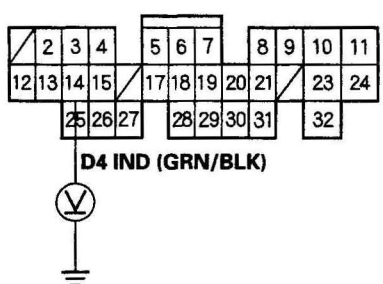
   Does the D4 indicator come on and stay on?

   YES – Go to step 2.

   NO – If the indicator comes on for about 2 seconds and then goes off, it's OK. If it doesn't come on at all, go to step 12.

2. Make sure the Honda PGM Tester is not connected to the data link connector.
3. Turn the ignition switch OFF.
4. Disconnect the A (32P) connector from the PCM.
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminal A14 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals

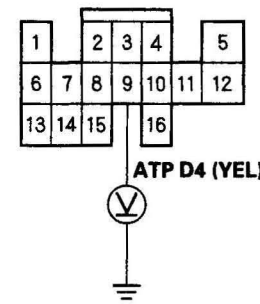
   Is there voltage?

   YES – Repair short to power in the wire between PCM connector terminal A14 and the gauge assembly. ■

   NO – Go to step 7.

7. Turn the ignition switch OFF.
8. Reconnect the A (32P) connector to the PCM.
9. Turn the ignition switch ON (II).
10. Shift to any position other than D4.
11. Measure the voltage between PCM connector terminal D9 and body ground.

PCM CONNECTOR D (16P)



Wire side of female terminals

   Is there voltage?

   YES – Faulty PCM or gauge assembly. ■

   NO – Check for a short to ground in the wire between PCM connector terminal D9 and the A/T gear position switch. If the wire is OK, check the A/T gear position switch. ■

12. Turn the ignition switch ON (II).
13. Shift to the D4 position.

    Does the D4 indicator come on?

    YES – Check for loose terminal fit in PCM connector A14 and recheck the D4 indicator several times. If the problem is intermittent, substitute a known-good PCM and recheck. If the indicator then works OK every time, replace the original PCM. ■

    NO – Go to step 14.

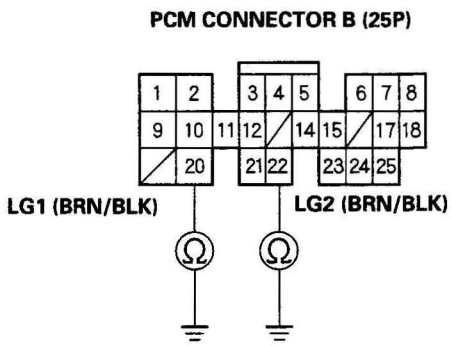
14. Turn the ignition switch OFF.

BACK

Protected by AR

15. Disconnect the B (25P) connector from the PCM.

16. Check for continuity between body ground and PCM connector terminals B20 and B22.



Wire side of female terminals

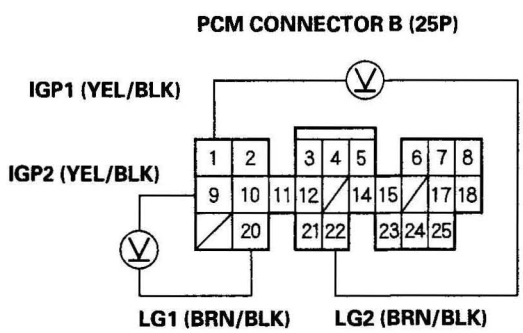
Is there continuity between ground and each terminal?

YES – Go to step 17.

NO – Repair open in the wire(s) between PCM connector terminal B20 or B22 and ground (G101), or repair poor ground (G101).■

17. Turn the ignition switch ON (II).

18. Measure the voltage between PCM connector terminals B1 and B22, and between terminals B9 and B20.



Wire side of female terminals

Is there battery voltage?

YES – Go to step 19.

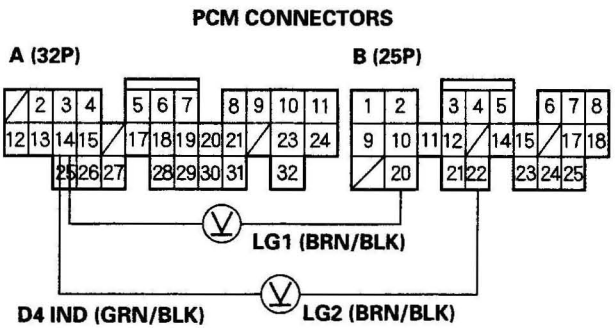
NO – Repair open or short in the wire between PCM connector terminal B1 or B9 and the PGM-FI main relay.■

19. Turn the ignition switch OFF.

20. Reconnect the B (25P) connector to the PCM.

21. Connect the digital multimeter between PCM connector terminals A14 and B20 or B22.

22. Turn the ignition switch ON (II).



Wire side of female terminals

Is there voltage for at least two seconds?

YES – Check for an open in the wire between PCM connector terminal A14 and the gauge assembly. If the wire is OK, check for a faulty D4 indicator bulb or a faulty printed circuit board in the gauge assembly.■

NO – Go to step 23.

(cont'd)

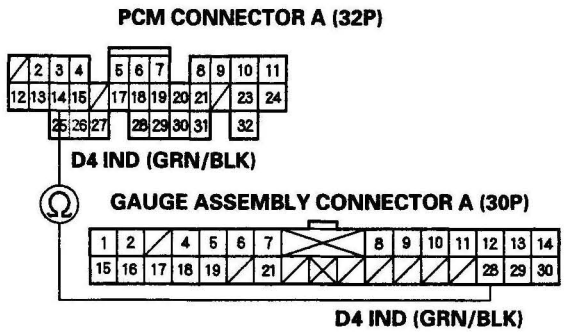
Protected by AR

D4 Indicator Circuit Troubleshooting (cont'd)

23. Turn the ignition switch OFF.

24. Disconnect the A (32P) connector from the PCM.

25. Check for continuity between PCM connector terminal A14 and No. 28 terminal of the gauge assembly A (30P) connector.



Wire side of female terminals

Is there continuity?

YES — Repair short in the wire between PCM connector terminal A14 and the gauge assembly. ■

NO — Check for loose terminal fit in PCM connector terminal A14. If necessary, substitute a known-good PCM and recheck. ■

BACK

Protected by AR

Sequential Sportshift A/T Shift Switch Circuit Trouboeshooting

1. Test-drive the vehicle in the D4 position, and check whether the transmission shifts up and down normally.

2. Check whether the OBD II scan tool indicates P0753, P0758, P0763 or P1709.

   Does the OBD II scan tool indicate any of the codes?

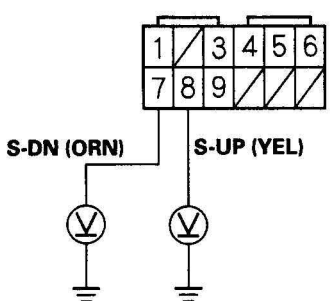
   YES—Perform the Troubleshooting Flowchart for the indicated Code(s).■

   NO—Go to step 3.

3. Turn the ignition switch ON (II).

4. Measure the voltage between PCM connector terminal E8 and body ground, and between E7 and body ground.

PCM CONNECTOR E (12P)



Wire side of female terminals

Is there about 5V?

YES—Go to step 5.

NO—Run the DTC Troubleshooting for code P1709 (see page 14-85).■

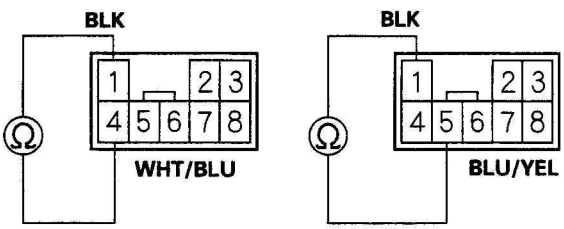
5. Turn the ignition switch OFF.

6. Remove the center console.

7. Disconnect the A/T shift switch connector.

8. Check for continuity between the No. 4 and No. 1 terminals of the A/T shift switch connector while pushing the shift lever toward the "+" mark on the A/T gear position indicator panel; then check for continuity between the No. 5 and No. 1 terminals while pulling the shift lever toward the "−" mark.

A/T SHIFT SWITCH CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Go to step 9.

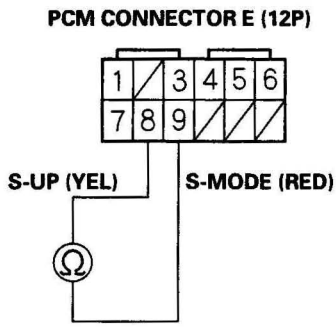
NO—Faulty A/T shift switch. Replace the shift lever detent bracket assembly.■

(cont'd)

Protected by AR

Sequential Sportshift A/T Shift Switch Circuit Trouboeshooting (cont'd)

9. Connect the A/T shift switch connector.
10. Disconnect the E (12P) connector from the PCM.
11. Check for continuity between PCM connector terminals E8 and E9 while pushing the shift lever toward the "+" mark.



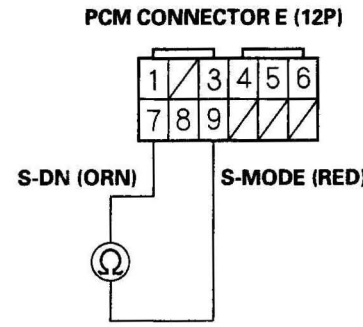
Wire side of female terminals

Is there continuity with the shift lever pushed toward "+" mark, and no continuity with it released?

YES—Go to step 12.

NO—Check for an open in the wire between PCM connector terminal E8 and the A/T shift switch connector. If wire is OK, replace the shift lever detent bracket assembly.■

12. Check for continuity between PCM connector terminals E7 and E9 while pulling the shift lever toward the "−" mark.



Wire side of female terminals

Is there continuity with the shift lever pulled toward "−" mark, and no continuity with it released?

YES—Check for loose terminal fit in the PCM connectors. If necessary, sustitute a known-good PCM and recheck.■

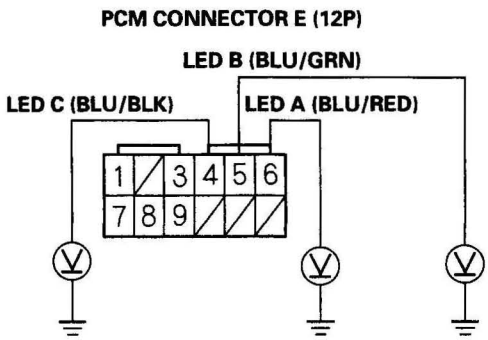
NO—Check for an open in the wire between PCM connector terminal E7 and the A/T shift switch connector. If wire is OK, replace the shift lever detent bracket assembly.■

BACK

Protected by AR

Sportshift Indicator Circuit Troubleshooting

1. Raise the front of the vehicle, and make sure it is securely supported.
2. Set the parking brake, and block both rear wheels securely.
3. Start the engine, and move the shift lever D4 into the sequential sportshift mode position.
4. Measure the voltage between PCM connector terminals E4, E5, and E and body ground individually in all four sequential sportshift mode gear positions.



Wire side of female terminals

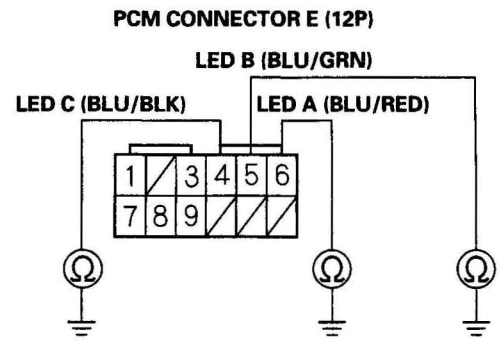
Sequential Sportshift Mode Gear Position	Terminal Voltage		
	E4 Terminal	E5 Terminal	E6 Terminal
1st	Battery voltage	0 V	0 V
2nd	0 V	Battery voltage	0 V
3rd	Battery voltage	Battery voltage	0 V
4th	0 V	0 V	Battery voltage

Does the voltage match the table?

YES – Replace the A/T shift indicator in the gauge assembly. ■

NO – Go to step 5.

5. Turn the ignition switch OFF.
6. Disconnect the E (12P) connector from the PCM.
7. Disconnect the gauge assembly A (30P) connector.
8. Check for continuity between PCM connector terminals E4, E5, and E6 and body ground individually.



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wires between PCM connector terminals E4, E5, and E6 and the gauge assembly. ■

NO – Check for loose terminal fit in PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

BACK

Protected by AR

A/T Gear Position Indicator

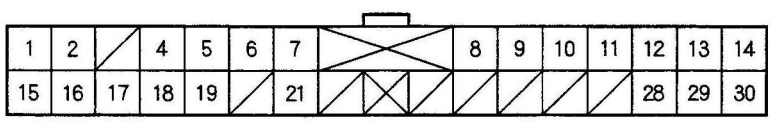
Indicator Input Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-15).

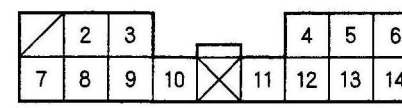
1. Remove the gauge assembly from the dashboard (see page 22-128), then disconnect the A (30P) and C (14P) connectors from the gauge assembly.
2. Inspect the connectors and connector terminals to be sure they are making good contact.
3. If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
4. Perform the following input test at the gauge assembly A (30P) and C (14P) connectors.

GAUGE ASSEMBLY CONNECTORS

A (30P)



C (14P)



Wire side of female terminals

Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
A7	BLK/BLU	Shift lever in P	Check for continuity to ground: There should be no continuity.	• Faulty A/T gear position switch • An open in the wire
A8	WHT	Ignition switch ON (II) and shift lever in R	Check for voltage to ground: There should be 1 V or less. NOTE: There should be battery voltage in any other shift lever position.	
A9	RED/BLK	Ignition switch ON (II) and shift lever in N		
A10	BLU	Ignition switch ON (II) and shift lever in 2		
A11	PNK	Ignition switch ON (II) and shift lever in D3		
A12	BRN	Ignition switch ON (II) and shift lever in 1		
A28	GRN/BLK	Ignition switch ON (II) and shift lever in D4	Check for voltage to ground: There should be battery voltage.	• Faulty A/T gear position switch • Faulty PCM • An open in the wire

BACK

Protected by AR

Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
C7	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
C9	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire

5. Connect the A (30P) and C (14P) connectors to the gauge assembly, then perform the following input test.

Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
A4	BLU/BLK	Start the engine and move the shift lever to the sequential sportshift mode 1st gear position	Check for voltage to ground: There should be 5 V.	• Faulty PCM • Faulty A/T shift switch • Faulty shift indicator • An open in the wire
A5	BLU/GRN		Check for voltage to ground: There should be 0 V.	
A6	BLU/RED			

6. If all the input tests prove OK, but the indicator is faulty, replace the printed circuit board.

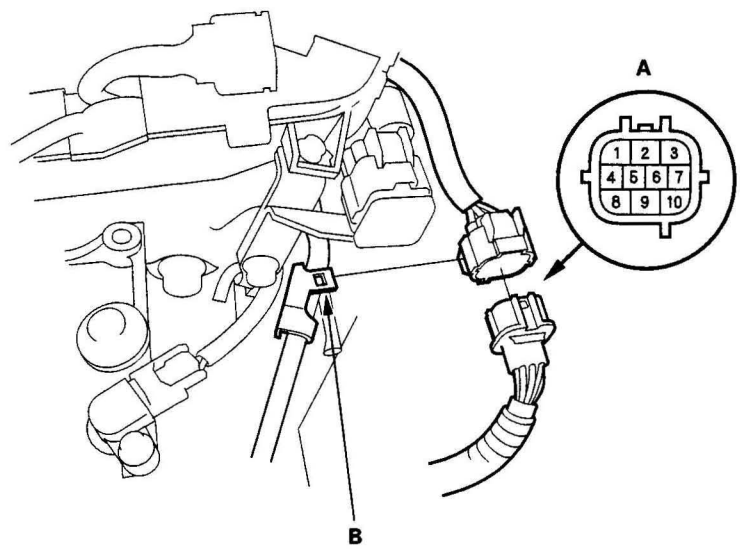
Protected by AR

A/T Gear Position Indicator

A/T Gear Position Switch Test

1. Remove the A/T gear position switch connector (A) from the connector bracket (B), then disconnect the connector.
2. Check for continuity between the terminals in each switch position according to the table below.

   NOTE: Terminal No.1: Neutral position switch



A/T Gear Position Switch Continuity Check

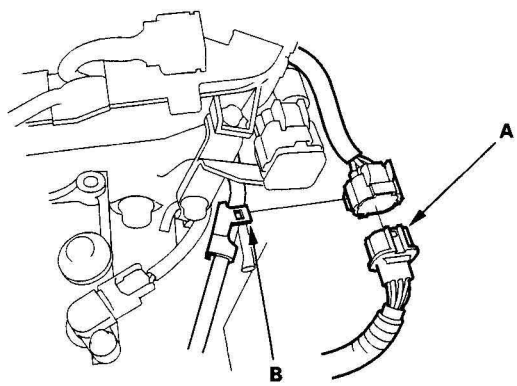
Terminal / Position	1	2	3	4	5	6	7	8	9	10
P	○		○							○
R			○						○	
N	○		○					○		
D4		○	○				○			
D3		○	○			○				
2		○	○		○					
1			○	○						

BACK

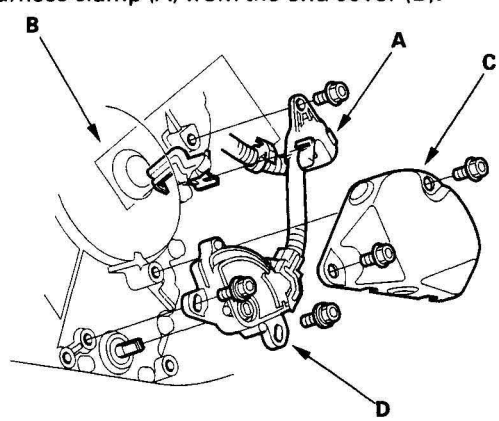
Protected by AR

A/T Gear Position Switch Replacement

1. Raise the front of the vehicle, and make sure it is securely supported (see page 1-14).
2. Set the parking brake, and block both rear wheels securely.
3. Shift to the N position.
4. Remove the A/T gear position switch connector (A) from the connector bracket (B), then disconnect the connector.

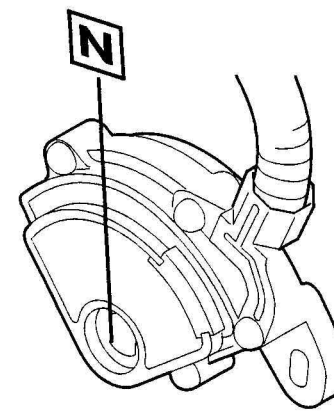


5. Remove the clamp from the harness clamp bracket on the transmission housing, and remove the harness clamp (A) from the end cover (B).

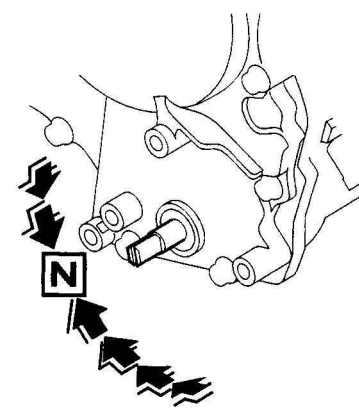


6. Remove the A/T gear position switch cover (C), then remove the A/T gear position switch (D) from the end cover.
7. Set the A/T gear position switch to the N position.

   NOTE: The A/T gear position switch clicks in the N position.



8. Set the control shaft to the N position.



(cont'd)

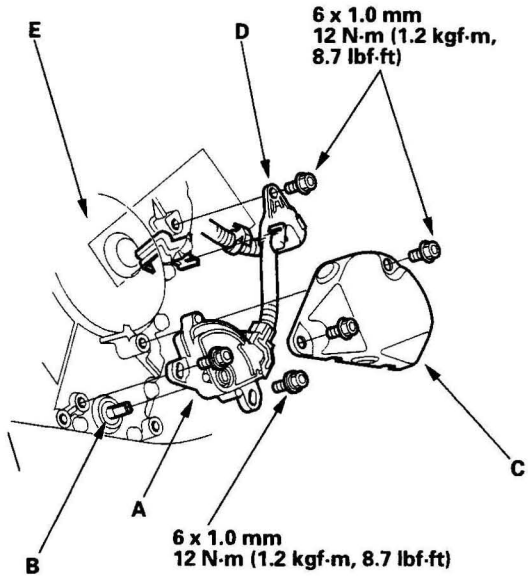
BACK

Protected by AR

A/T Gear Position Switch Replacement (cont'd)

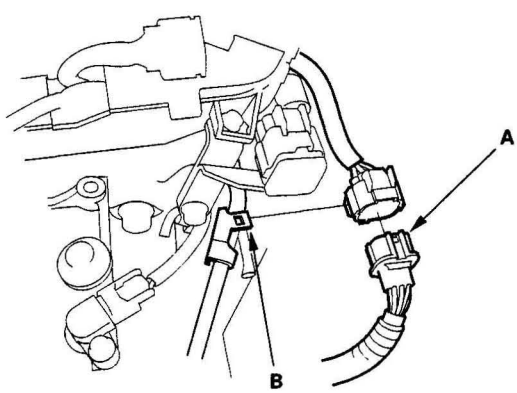
9. Install the A/T gear position switch (A) gently on the control shaft (B), then secure it with the bolts.

   NOTE: Take care not to move the A/T gear position switch when tightening the bolts.

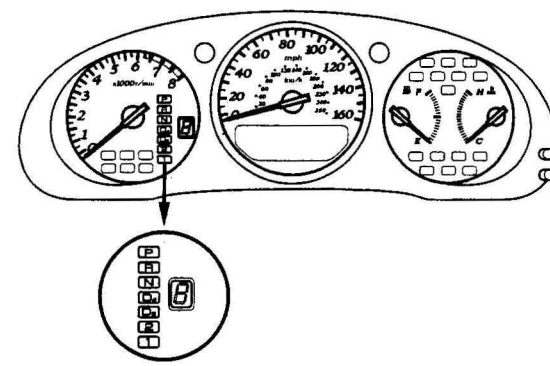


10. Install the A/T gear position switch cover (C), and the harness clamp (D) on the end cover (E).

11. Connect the A/T gear position switch connector (A), then install it on the connector bracket (B).



12. Turn the ignition switch ON (II). Move the shift lever through all gears, and check the A/T gear position switch synchronization with the A/T gear position indicator.



13. Start the engine. Move the shift lever through all gears, and verify the following:

    - The engine will not start in any position other than N or P.
    - The back-up lights come on when the shift lever is in the R position.

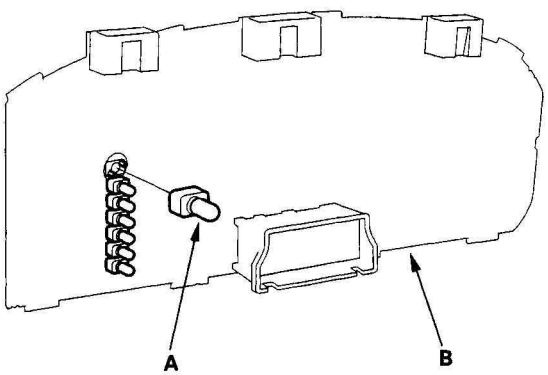
BACK

Protected by AR

Indicator Bulb Replacement

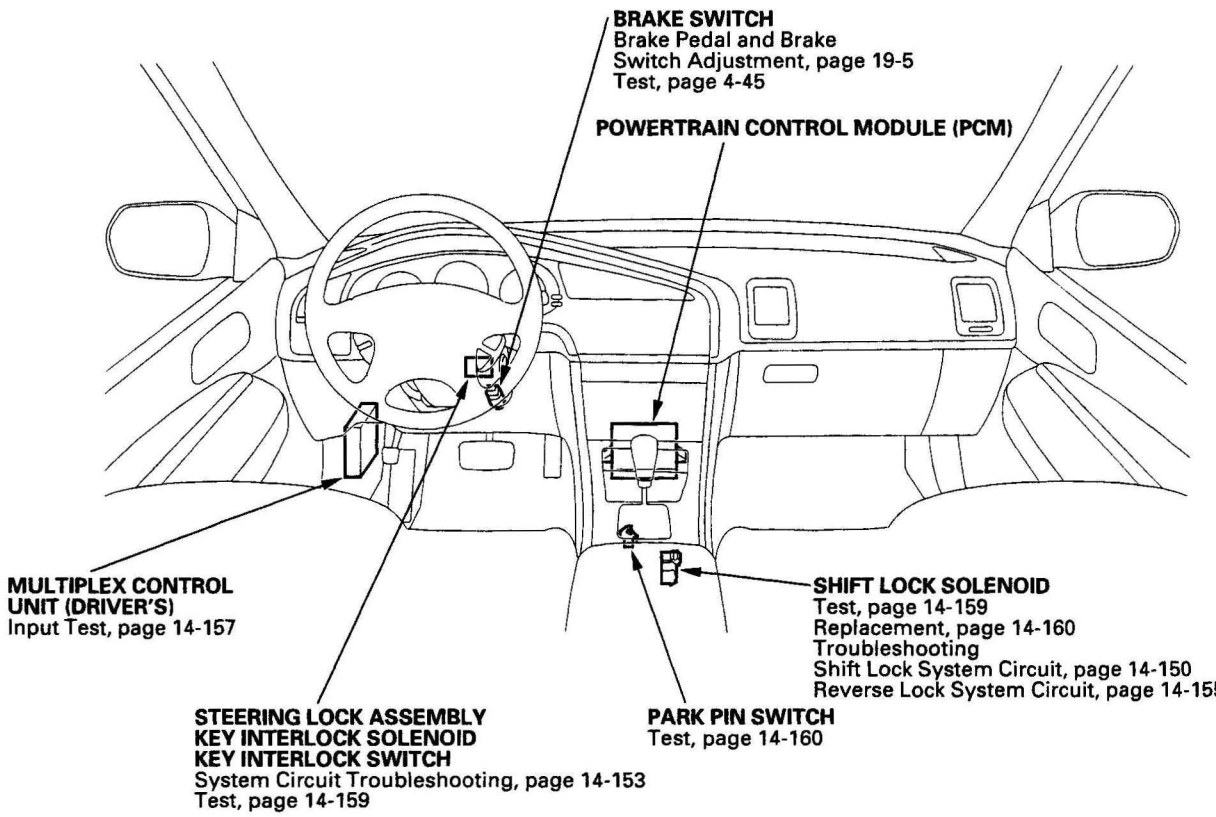
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-15).

1. Remove the gauge assembly (see page 22-128).
2. Disassemble the gauge assembly.
3. Replace the bulbs (A) at the gauge assembly (B).



Protected by AR

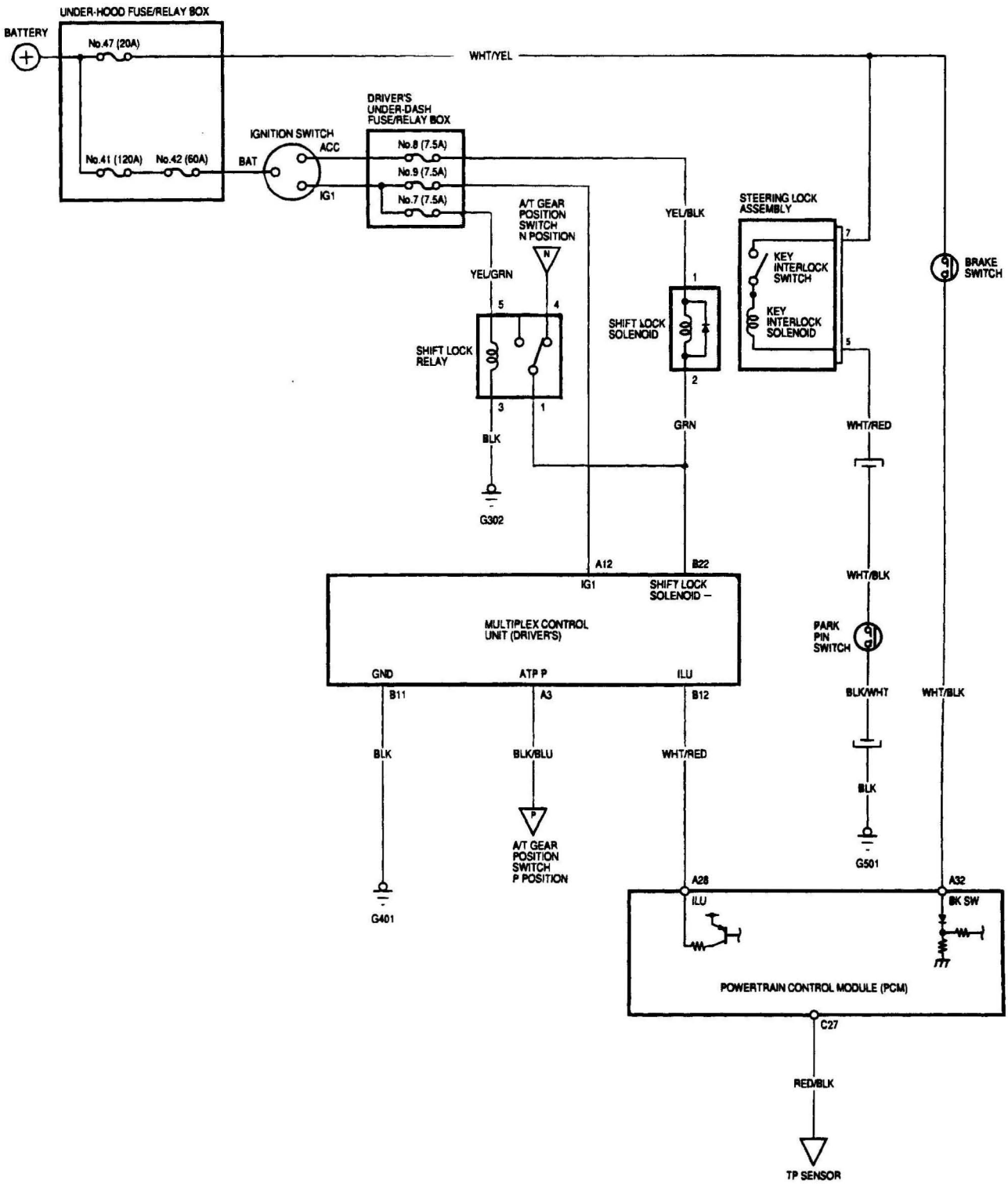
Component Location Index



BACK

Protected by AR

Circuit Diagram



BACK

Protected by AR

Shift Lock System Circuit Troubleshooting

1. Press the brake pedal.

   Are the brake lights ON?

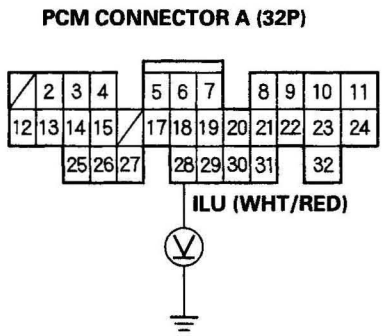
   YES—Go to step 2.

   NO—Repair faulty brake light circuit.■

2. Turn the ignition switch ON (II), and shift to the Ⓟ position.

3. Press the brake pedal, and release the accelerator pedal.

4. Measure the voltage between PCM connector terminal A28 and body ground.



Wire side of female terminals

   Is there battery voltage?

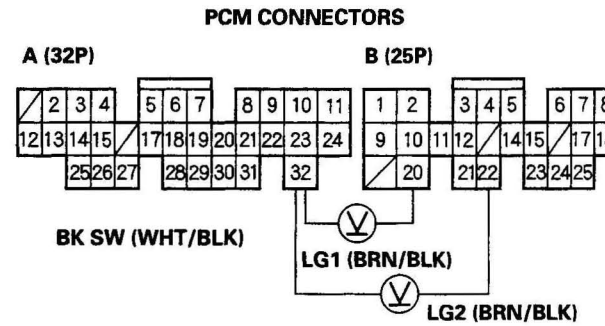
   YES—Check for an open in the wire between the A 28 terminal and the multiplex control unit (driver's), and check for loose terminal fit in the multiplex control unit (driver's) connectors. If necessary, substitute a known-good multiplex control unit (driver's) and recheck.■

   NO—Go to step 5.

5. Turn the ignition switch OFF.

6. Disconnect the A (32P) and B (25P) connectors from the PCM.

7. Press the brake pedal and measure the voltage between PCM connector terminals A32 and B20 or B22 .



Wire side of female terminals

   Is there battery voltage?

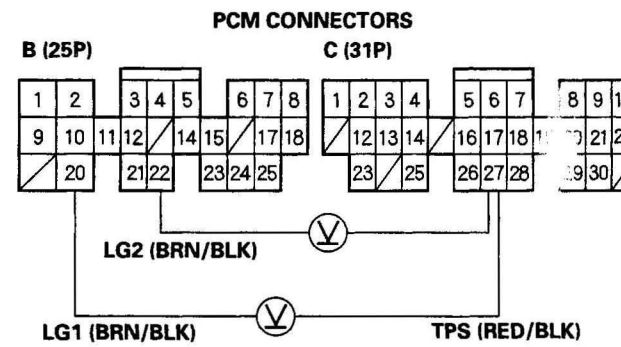
   YES—Release the brake pedal, and go to step 8.

   NO—Repair open in the wire between PCM connector terminal A32 and the brake switch.■

8. Reconnect the A (32P) and B (25P) connectors to the PCM.

9. Turn the ignition switch ON (II).

10. Measure the voltage between PCM connector terminals C27 and B20 or B22 .



Wire side of female terminals

   Is there about 0.5 V (throttle fully closed)?

   YES—Go to step 15.

   NO—Go to step 11.

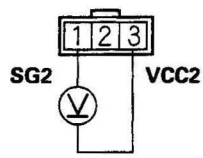
11. Turn the ignition switch OFF.

BACK

Protected by AR

12. Disconnect the throttle position sensor connector.
13. Measure the voltage between the No. 1 and No. 3 terminal of the throttle position sensor connector.

THROTTLE POSITION SENSOR CONNECTOR



Terminal side of male terminals

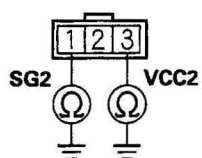
Is there about 5V?

YES – Check for short or open in the wire between PCM connector terminal C27 and the TPS. If the wire is OK, replace the TPS. ■

NO – Go to step 14.

14. Turn the ignition switch OFF, and disconnect the PCM connector. Check for continuity between the No. 1 terminal and body ground, and between the No. 3 terminal and body ground.

THROTTLE POSITION SENSOR CONNECTOR



Terminal side of male terminals

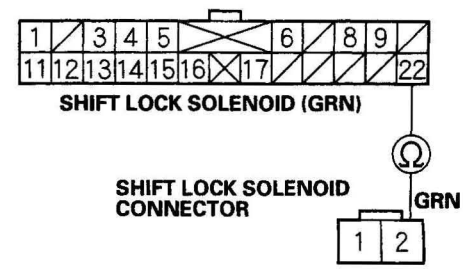
Is there continuity?

YES – Check for a short to ground between the No. 3 terminal of the TPS connector and ground. If the wire is OK, replace the PCM. ■

NO – Go to step 15. ■

15. Disconnect the shift lock solenoid connector.
16. Check for continuity between the No. 2 terminal of the shift lock solenoid connector and the No. 22 terminal of the multiplex control unit (driver's) connector B (22P).

MULTIPLEX CONTROL UNIT (DRIVER'S) CONNECTOR B (22P)



Wire side of female terminals

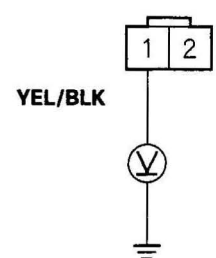
Is there continuity?

YES – Go to step 17.

NO – Repair open in the wire between the No. 22 terminal of the multiplex control unit (driver's) connector B (22P) and the shift lock solenoid. ■

17. Turn the ignition switch ON (II).
18. Measure the voltage between the No. 1 terminal of the shift lock solenoid connector and body ground.

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 19.

NO – Check for blown No. 8 (7.5 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open or short in the wire between the No. 1 terminal of the shift lock solenoid and the driver's under-dash fuse/relay box. ■

(cont'd)

Protected by AR

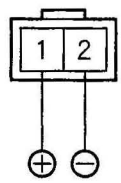
Shift Lock System Circuit Troubleshooting (cont'd)

19. Connect the No. 1 terminal of the shift lock solenoid connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal.

    NOTE: Do not connect the No. 2 terminal to the battery positive terminal or you will damage the diode inside the shift lock solenoid.

20. Check that the shift lock solenoid operates.

SHIFT LOCK SOLENOID CONNECTOR



Terminal side of male terminals

Does the shift lock solenoid operate properly?

YES—Check for a loose multiplex control unit (driver's) connector. If necessary, substitute a known-good multiplex control unit (driver's) and recheck.■

NO—Replace the shift lock solenoid.■

BACK

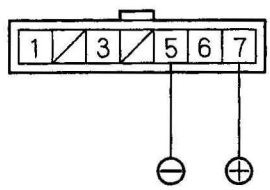
Protected by AR

Key Interlock System Circuit Troubleshooting

1. Disconnect the key switch connector (7P) from the steering lock assembly.

2. Connect the No. 7 terminal of the key switch connector to the battery positive terminal, and connect the No. 5 terminal to the battery negative terminal.

KEY SWITCH CONNECTOR (7P)



Terminal side of male terminals

3. Turn the ignition switch to ACC (I), then push the ignition key.

4. Check the key interlock solenoid operation. A clicking sound should be heard while pushing the ignition key, and you should not be able to turn it to the OFF position.

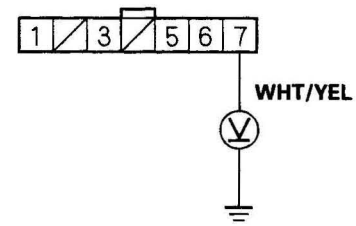
Does the key interlock solenoid operate properly?

YES – Go to step 5.

NO – Faulty key interlock solenoid/switch. Replace the ignition key cylinder/steering lock assembly. ■

5. Measure the voltage between the No. 7 terminal and body ground.

KEY SWITCH CONNECTOR (7P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 6.

NO – Check for blown No. 47 (20A) fuse in the under-hood fuse/relay box. If the fuse is OK, repair open or short in the wire between the No. 7 terminal of the key switch connector and under-hood fuse/relay box. ■

(cont'd)

BACK

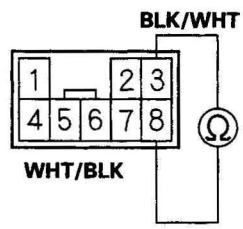
Protected by AR

Key Interlock System Circuit Troubleshooting (cont'd)

6. Disconnect the A/T shift switch connector on the rear of the shift lever.

7. With the shift lever in Park and pushed to the right, check for continuity between the No. 3 and No. 8 terminals of the A/T shift switch connector.

A/T SHIFT SWITCH CONNECTOR



Terminal side of male terminals

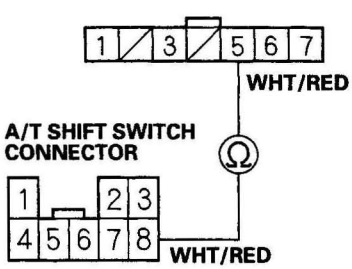
Is there continuity?

YES – Go to step 8.

NO – Repair open in the wires between the park pin switch and the A/T shift switch connector. If the wires are OK, replace the park pin switch and the A/T shift switch assembly. ■

8. Check for continuity between the No. 8 terminal of the A/T shift switch connector and the No. 5 terminal of the key switch connector.

KEY SWITCH CONNECTOR (7P)



Wire side of female terminals

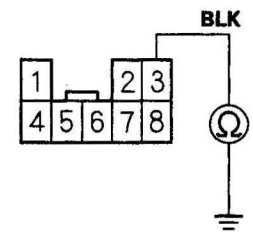
Is there continuity?

YES – Go to step 9.

NO – Repair open in the wire between No. 8 terminal of the A/T shift switch connector and the No. 5 terminal of the key switch connector. ■

9. Check for continuity between the No. 3 terminal of the A/T shift switch connector and body ground.

A/T SHIFT SWITCH CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Check for loose terminal fit in the key switch connector and A/T shift switch connector. If necessary, substitute a known-good steering lock assembly. ■

NO – Repair open in the wire between the No. 3 terminal of the A/T shift switch connector and ground (G501). Repair poor ground (G501). ■

BACK

Protected by AR

Reverse Lock System Circuit Troubleshooting

1. Check whether the OBD II scan tool indicates P1705 or P1706.

   Does the OBD II scan tool indicate either code?

   YES – Perform the DTC Troubleshooting for the indicated Code(s). ■

   NO – Go to step 2.

2. Turn the ignition switch OFF.
3. Shift the shift lever into the [P] position while pushing the shift lock release.
4. Turn the ignition switch ON (II).
5. Depress the brake pedal, and do not depress the accelerator pedal.
6. Shift the shift lever out of the [P] position to check that the shift lock solenoid operates.

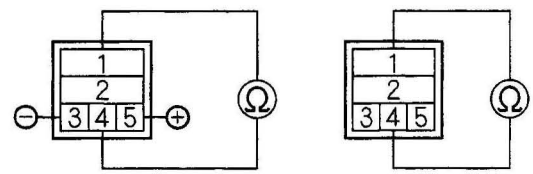
   Does the shift lever shift out of the [P] position?

   YES – Go to step 7.

   NO – Perform the Troubleshooting for the Shift Lock System Circuit (see page 14-150). ■

7. Turn the ignition switch OFF.
8. Remove the shift lock relay.
9. Check for continuity between the No. 1 and No. 4 terminals of the shift lock relay while connecting the battery positive terminal to the No. 5 terminal of the shift lock relay, and connecting the negative terminal to the No. 3 terminal.

SHIFT LOCK RELAY



Terminal side of male terminals

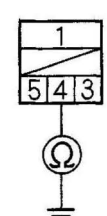
Is there no continuity when connecting the battery terminals, and continuity when disconnecting the battery terminals?

YES – Go to step 10.

NO – Replace the shift lock relay. ■

10. Shift the shift lever into the [N] position.
11. Check the continuity between the No. 4 terminal of the shift lock relay socket and body ground.

SHIFT LOCK RELAY SOCKET



Terminal side of male terminals

Is there continuity?

YES – Go to step 12.

NO – Repair open in the wire between the No. 4 terminal of the shift lock relay and the shift position switch. ■

(cont'd)

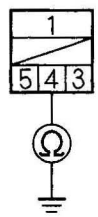
Protected by AR

Reverse Lock System Circuit Troubleshooting (cont'd)

12. Shift the shift lever out of the [N] position.

13. Check for continuity between the No. 4 terminal of the shift lock relay socket and body ground.

SHIFT LOCK SOCKET



Terminal side of female terminals

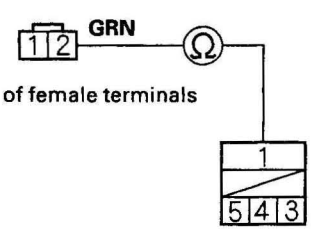
Is there continuity?

YES – Repair short to ground in the wire between the No. 4 terminal of the shift lock relay and the shift position switch. ■

NO – Go to step 14.

14. Check for continuity between the No. 1 terminal of the shift lock relay socket and the No. 2 termial of the shift lock solenoid connector.

SHIFT LOCK SOLENOID CONNECTOR



Terminal side of female terminals

Is there continuity?

YES – Check for loose terminal fit in the connectors. Repair the reverse lock mechanism. ■

NO – Repair open in the wire between the No. 1 terminal of the shift lock relay and the shift lock solenoid connector. ■

BACK

Protected by AR

Control Unit Input Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-15).

1. Disconnect the 22P connector from the multiplex control unit, driver's, then remove the control unit from the driver's under-dash fuse/relay box.

2. Inspect the connectors and connector terminals to be sure they are all making good contact.

   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 3.

   NOTE: If the shift lock solenoid clicks when the ignition switch is turned ON (II) while depressing the brake pedal with the shift lever in the [P] position, the shift lock system is OK. If the shift lever cannot be shifted from [P] position, test the A/T gear position switch.

3. With the control unit still disconnected from its connectors and the fuse/relay box, make these input tests.

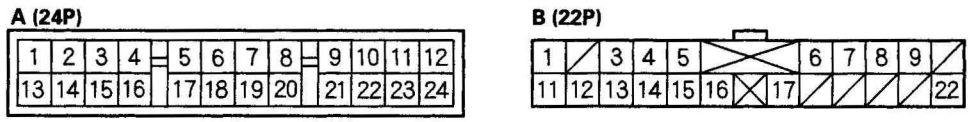
   - If a test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 4.

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

MULTIPLEX CONTROL UNIT, DRIVER'S, CONNECTORS



Terminal side of male terminals

Wire side of female terminals

Multiplex Control Unit (Driver's) 24P Connector

Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
A12	———	Ignition switch turned ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A3	———	Shift lever in P	Check for continuity to ground: There should be continuity.	• Faulty A/T gear position switch • Poor ground (G101) • An open in the wire

Multiplex Control Unit (Driver's) 22P Connector

Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
B22	GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 8 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty shift lock solenoid • An open in the wire

4. Reconnect the connectors to the multiplex control unit, and make this input test.

- If a test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, substitute a known-good multiplex control unit, and recheck the system. If the system is OK, the multiplex control unit, must be faulty; replace it.

B12	WHT/RED	Ignition switch ON (II) and brake pedal pushed	Check for voltage to ground: There should be battery voltage.	• Faulty brake switch • Faulty PCM • Faulty multiplex control unit (driver's) • An open in the wire
		Ignition switch ON (II), brake pedal and accelerator pedal depressed at the same time	Check for voltage to ground: There should be 1 V or less.	

BACK

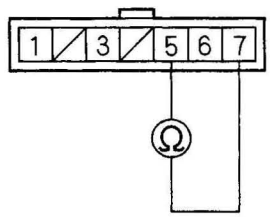
Protected by AR

Key Interlock Solenoid/Switch Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-15).

1. Remove the driver's dashboard lower cover (see page 20-65).
2. Disconnect the key switch connector (7P) from the steering lock assembly.
3. Check for continuity between the No. 5 and No. 7 terminals when the key is pushed, and check for no continuity when the key is released.

KEY SWITCH CONNECTOR (7P)

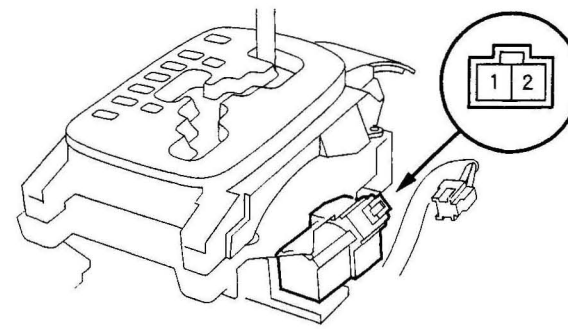


Terminal side of male terminals

4. Check that the key cannot be removed with power connected to the No. 7 terminal and ground connected to the No. 3 terminals.
   - If the key cannot be removed, the key interlock solenoid is OK.
   - If the key can be removed, replace the steering lock assembly (the key interlock solenoid is not available separately).

Shift Lock Solenoid Test

1. Remove the console panel (see page 20-63).
2. Disconnect the shift lock solenoid 2P connector.



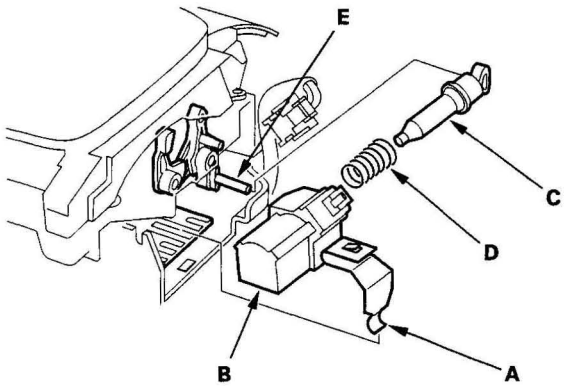
3. Connect the No. 1 terminal of the shift lock solenoid connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal.
4. Check that the shift lever can be moved from the P position. Release the battery terminals from the shift lock solenoid connector. Move the shift lever back to the P position, and make sure it locks.

   NOTE: Do not connect power to the No. 2 terminal (reverse polarity) or you will damage the diode inside the solenoid.
5. Check that the shift lock releases when the release lever is pushed, and check that it locks when the release lever is released.
6. If the solenoid does not work, replace it.

Protected by AR

Shift Lock Solenoid Replacement

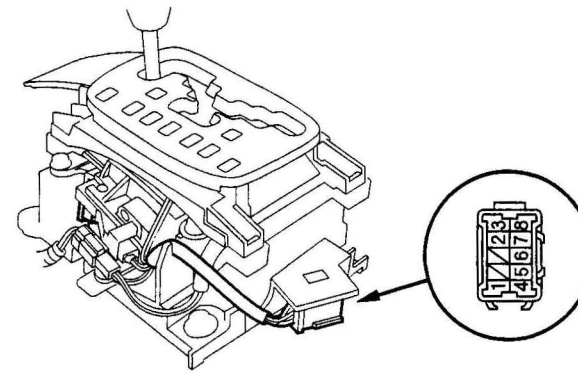
1. Remove the console panel (see page 20-63).
2. Disconnect the shift lock solenoid 2P connector.
3. Pry the shift lock solenoid clamp (A) with a screwdriver, then remove the shift lock solenoid (B).



4. Install the shift lock solenoid plunger (C) and plunger spring (D) in the new shift lock solenoid.
5. Install the shift lock solenoid by aligning the joint of the shift lock solenoid with the tip of the shift lock stop (E).
6. Secure the shift lock solenoid with the clamp, then connect the shift lock solenoid connector.

Park Pin Switch Test

1. Remove the console panel (see page 20-63).
2. Disconnect the mode switch/park pin connector.



3. Shift the shift lever into the [P] position, then check for continuity between the No. 3 and No. 8 terminals. There should be no continuity.
4. Shift the shift lever out of the [P] position, and check for continuity between the terminals in step 3. There should be continuity.
5. If the park pin switch is faulty, replace the detent bracket assembly.

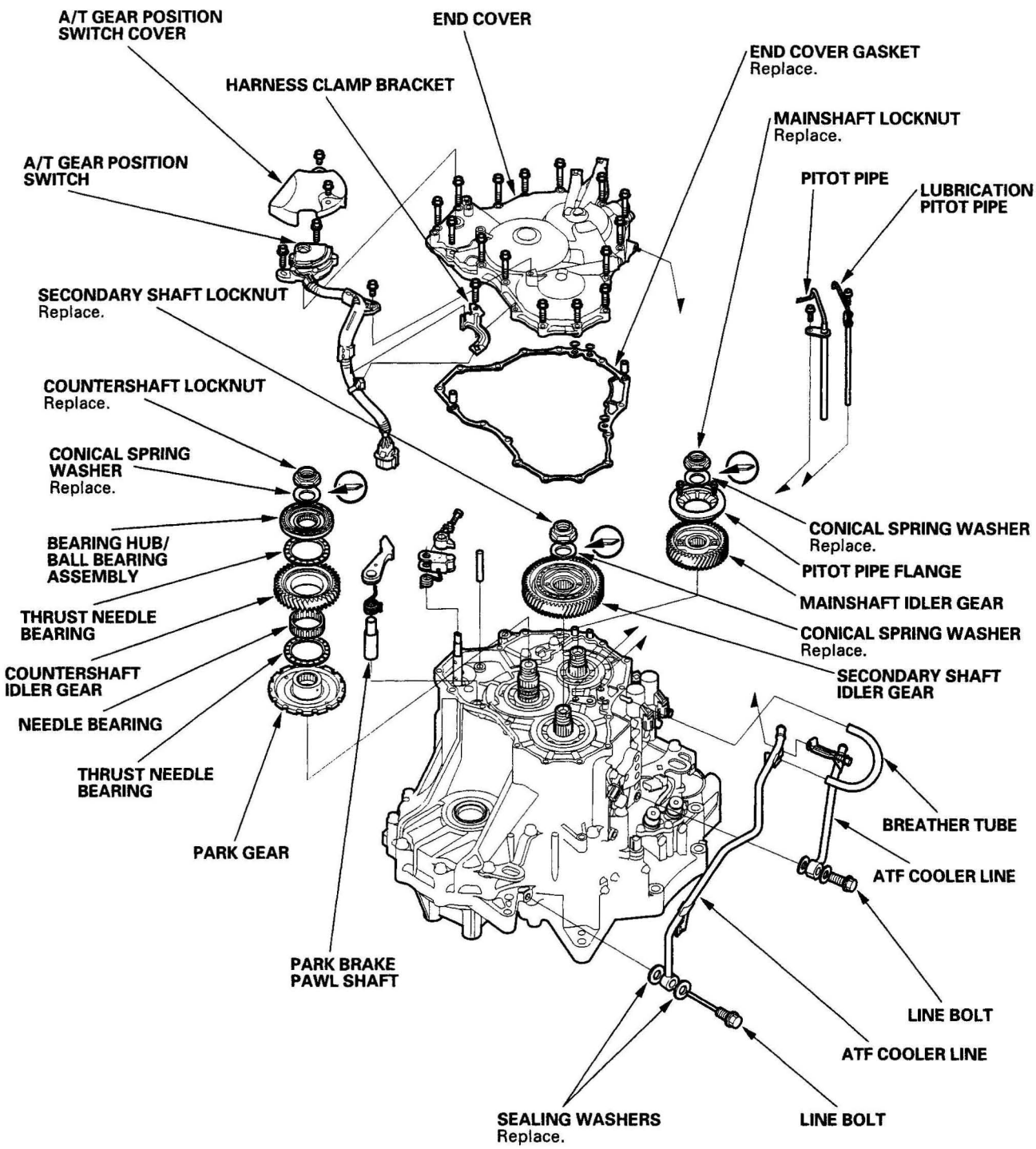
   NOTE: The park pin switch is not available separately from the detent bracket.

BACK

Protected by AR

End Cover and Idler Gears Removal

Exploded View



(cont'd)

BACK

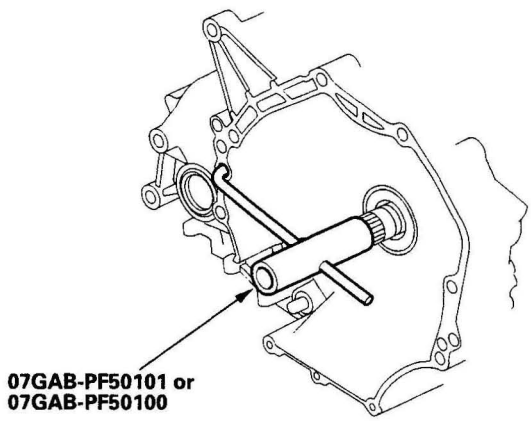
Protected by AR

End Cover and Idler Gears Removal (cont'd)

Special Tools Required
Mainshaft holder
07GAB-PF50101 or 07GAB-PF50100

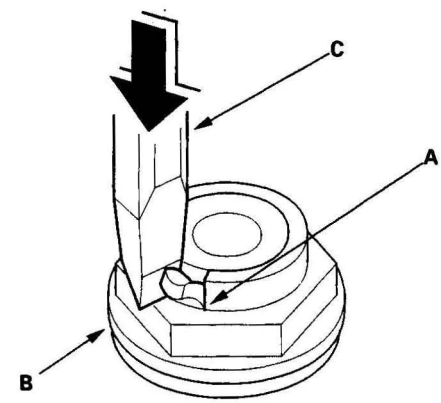
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the A/T gear position switch cover.
2. Remove the harness clamp bolt and the two A/T gear position switch bolts, then remove the A/T gear position switch.
3. Remove the 16 bolts securing the end cover, then remove the end cover.
4. Slip the special tool onto the mainshaft.

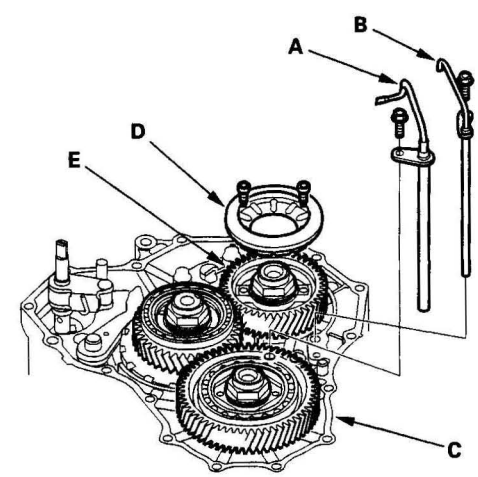


5. Engage the park pawl with the park gear.
6. Cut the lock tabs (A) of each shaft locknut (B) using a chisel (C). Then remove the locknuts and conical spring washers from each shaft.

   NOTE:
   - Countershaft and secondary shaft locknuts have left-hand threads.
   - Clean the old locknuts; they are used to install the press fit idler gears on the mainshaft and secondary shaft, and the park gear and bearing hub on the countershaft.
   - Keep all of the chiseled particles out of the transmission.



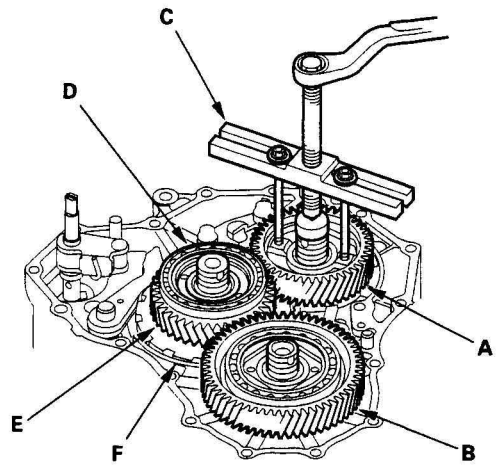
7. Remove the special tool from the mainshaft.
8. Remove the pitot pipe (A) and the lubrication pitot pipe (B) from the transmission housing (C), then remove the pitot flange (D) from the mainshaft idler gear (E).



BACK

Protected by AR

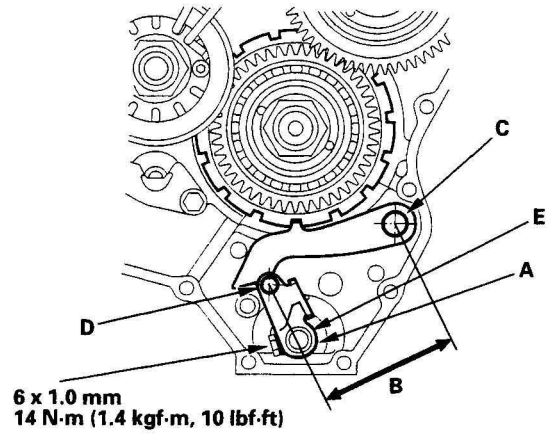
9. Remove the mainshaft idler gear (A) and the secondary shaft idler gear (B) with a puller (C).



10. Remove the bearing hub (D) with the puller from the countershaft, then remove the countershaft idler gear (E) and bearings.
11. Remove the park gear (F) with the puller.
12. Remove the park pawl, spring, shaft, and shaft stop.
13. Remove the park lever from the control shaft.
14. Remove the line bolts, then remove the ATF cooler lines.

Park Lever Stop Inspection and Adjustment

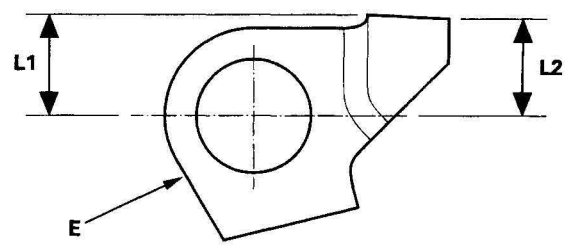
1. Set the park lever (A) in the [P] position.



2. Measure the distance (B) between the park pawl shaft (C) and the park lever roller pin (D).

STANDARD: 84.6 – 85.6 mm (3.33 – 3.37 in.)

3. If the measurement is out of tolerance, select and install the appropriate park lever stop (E) from the table below.



PARK LEVER STOP

Mark	Part Number	L1	L2
1	24537-PA9-003	11.00 mm (0.433 in.)	11.00 mm (0.433 in.)
2	24538-PA9-003	10.80 mm (0.425 in.)	10.65 mm (0.419 in.)
3	24539-PA9-003	10.60 mm (0.417 in.)	10.30 mm (0.406 in.)

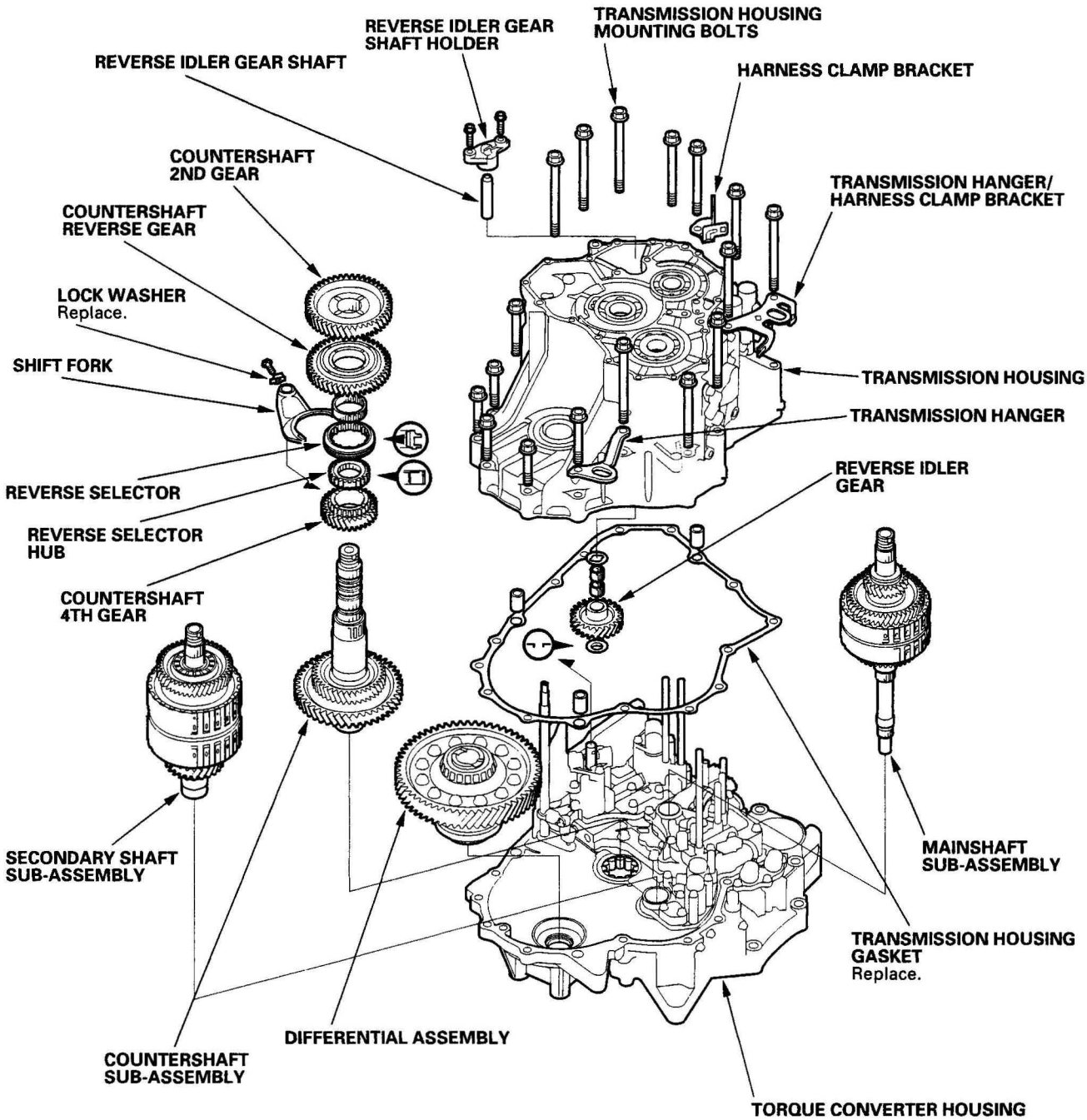
4. After replacing the park lever stop, make sure the distance is within tolerance.

BACK

Protected by AR

Housing and Shaft Assemblies Removal

Exploded View



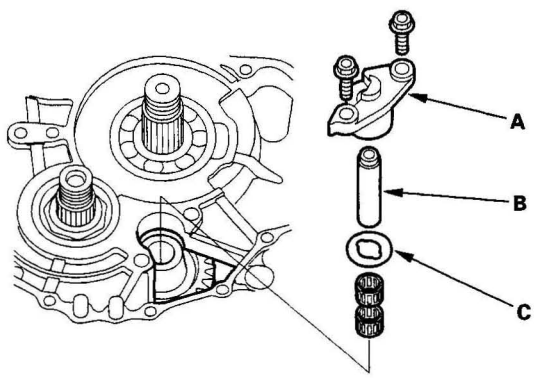
BACK

Protected by AR

Special Tools Required
Housing puller 07HAC-PK40102

NOTE: Refer to the Exploded View as needed during the following procedure.

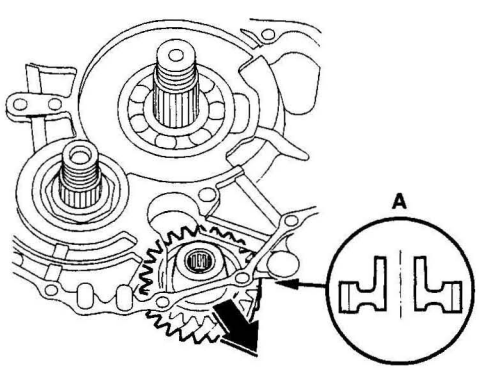
1. Remove the two bolts securing the reverse idler gear shaft holder, then remove the reverse idler gear shaft holder (A), shaft (B), and washer (C).



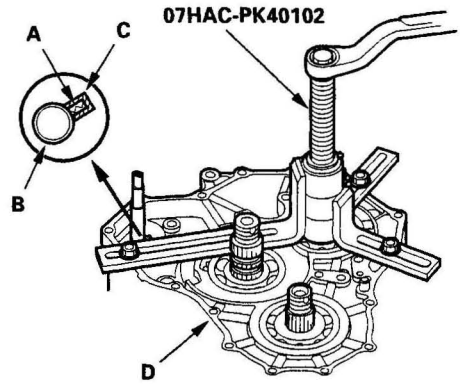
2. Remove the transmission housing mounting bolts, transmission hangers, and harness clamp bracket.

3. Move the reverse idler gear (A) to disengage it from the mainshaft and countershaft reverse gears.

   NOTE: The transmission housing will not separate from the torque converter housing if the reverse idler gear is not moved.



4. Align the spring pin (A) on the control shaft (B) with the transmission housing groove (C) by turning the control shaft.



5. Install the special tool over the mainshaft, then remove the transmission housing (D).

   NOTE: If the top arm of your housing puller is too short, replace it with Housing Puller Arm, 205 mm, T/N 07SAC-P0Z0101.

6. Remove the reverse idler gear, needle bearings, and thrust washer from the transmission housing.

7. Remove the countershaft 2nd gear, then remove the countershaft reverse gear and the needle bearing.

8. Remove the lock bolt securing the shift fork, then remove the shift fork with the reverse selector, reverse selector hub, countershaft 4th gear, and needle bearing from the countershaft. If the reverse selector hub is press-fitted, leave it and 4th gear on the countershaft.

9. Remove the secondary shaft subassembly. If the reverse selector hub is press-fitted, remove the secondary shaft subassembly, countershaft subassembly and mainshaft subassembly together.

10. Remove the countershaft subassembly.

11. Remove the mainshaft subassembly.

12. Remove the differential assembly.

Protected by AR

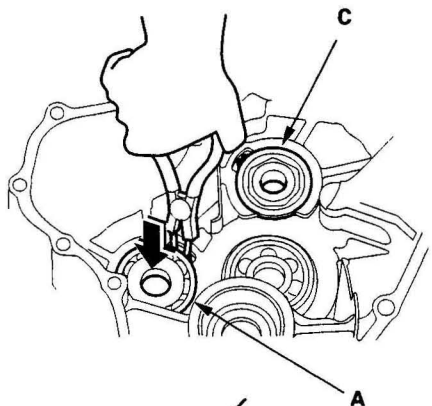
Bearing Removal and Installation

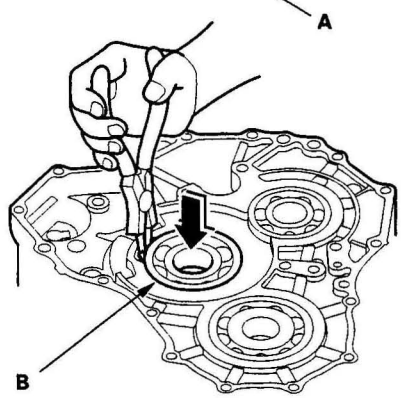
Special Tools Required
- Driver 07749-0010000
- Seal driver attachment 07GAD-PG40101 or 07GAD-PG40100
- Attachment, 62 x 68 mm 07746-0010500
- Attachment, 72 x 75 mm 07746-0010600

NOTE: Coat all parts with ATF before assembly.

1. To remove the mainshaft bearing (A), countershaft bearing (B), and secondary shaft bearing (C) from the transmission housing, expand each snap ring with the snap ring pliers, then push the bearing out.

   NOTE: Do not remove the snap rings unless it's necessary to clean the grooves in the housing.

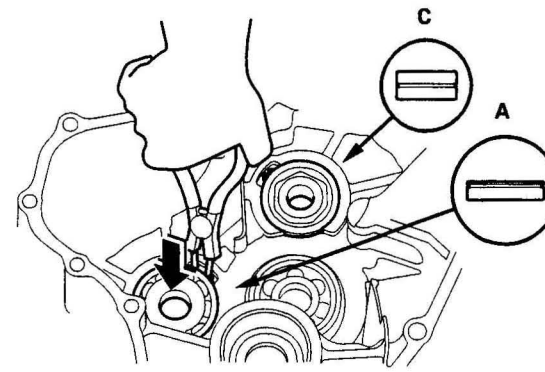


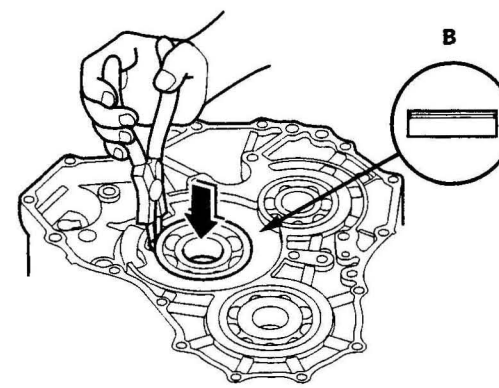


2. Install the bearings in the direction shown.

3. Expand each snap ring with the snap ring pliers, and insert the bearing part-way into the housing.

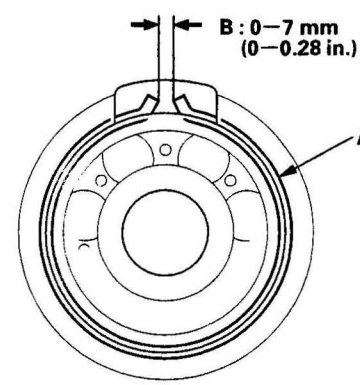
4. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.





5. After installing the bearings verify the following:

   - The snap rings (A) are seated in the bearing and housing grooves.
   - The ring end gaps (B) are correct.

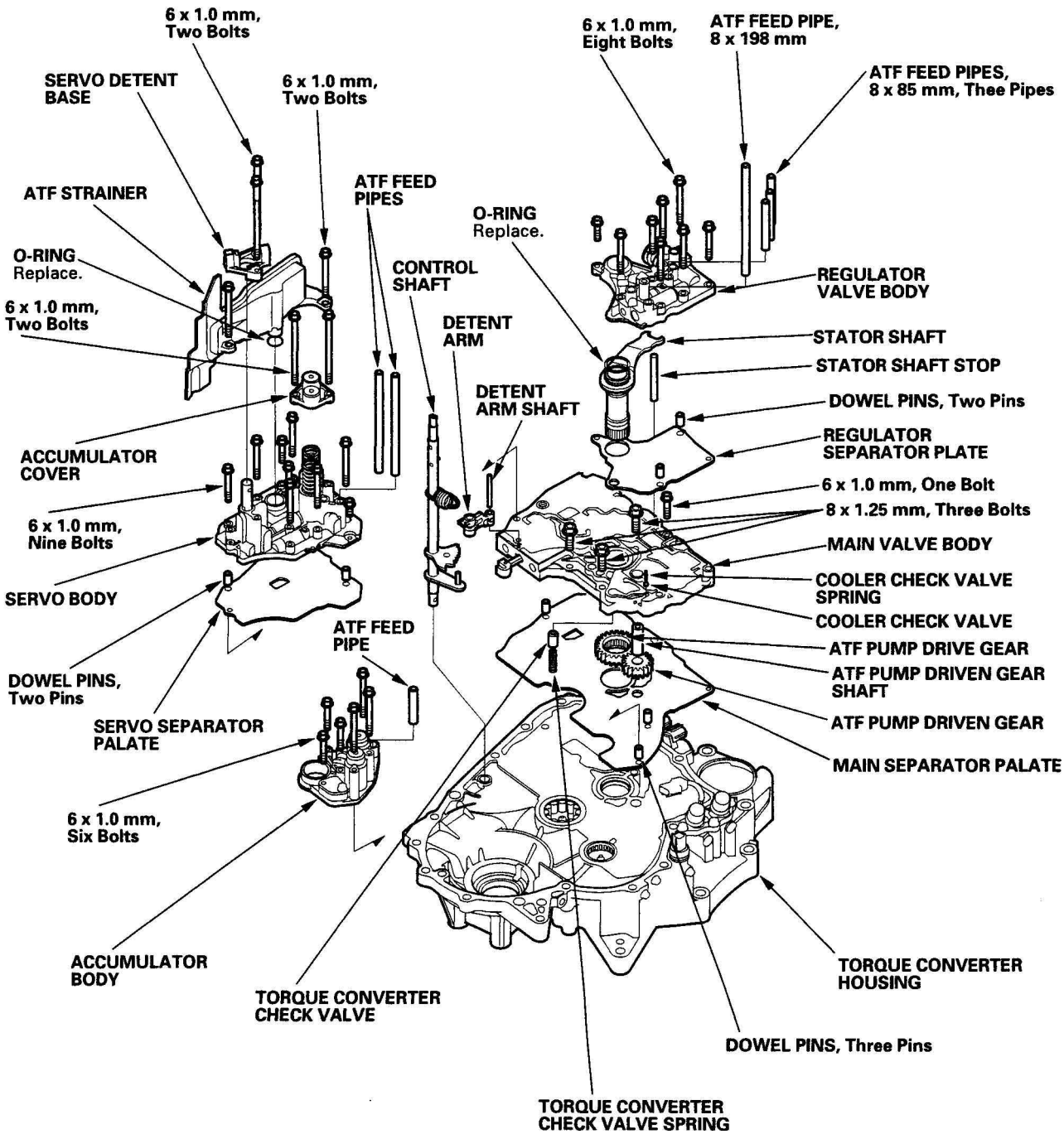


BACK

Protected by AR

Valve Bodies and ATF Strainer Removal

Exploded View



(cont'd)

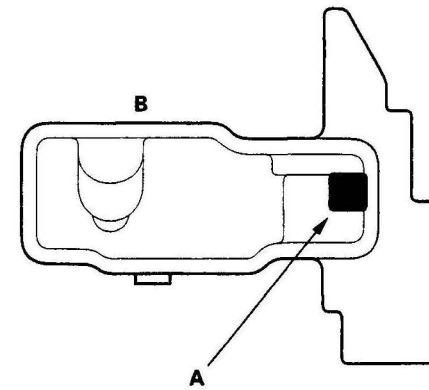
BACK

Protected by AR

Valve Bodies and ATF Strainer Removal (cont'd)

NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF feed pipes from the regulator valve body, servo body, and accumulator body.
2. Remove the servo detent base (two bolts).
3. Remove the ATF strainer (two bolts).
4. Remove the accumulator cover (two bolts).
5. Remove the bolts securing the servo body (nine bolts), then remove the servo body, servo separator plate and dowel pins (two).
6. Remove the accumulator body (six bolts).
7. Remove the regulator valve body (eight bolts).
8. Remove the stator shaft and stator shaft stop.
9. Remove the regulator separator plate and dowel pins (two).
10. Unhook the detent spring from the detent arm, then remove the detent arm shaft, detent arm, and control shaft.
11. Remove the cooler check valve spring and cooler check valve (steel ball).
12. Remove the main valve body (four bolts).
13. Remove the torque converter check valve and spring.
14. Remove the ATF pump driven gear shaft, then remove the ATF pump gears.
15. Remove the main separator plate and dowel pins (three).
16. Clean the inlet opening (A) of the ATF strainer (B) thoroughly with compressed air, then check that it is in good condition, and that the inlet opening is not clogged.



17. Test the ATF strainer by pouring clean ATF through the inlet opening, and replace it if it is clogged or damaged.

BACK

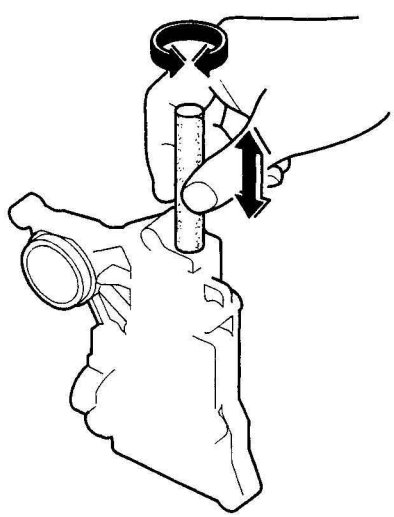
Protected by AR

Valve Body Repair

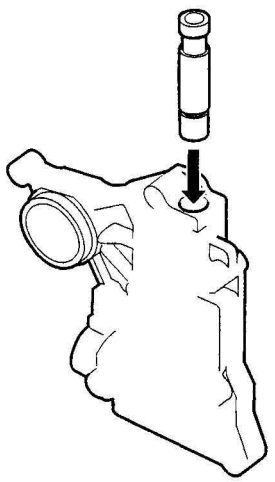
NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. Use this procedure to free the valves.

1. Soak a sheet of # 600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore. It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.
3. Inspect the valve for any scuff marks. Use the ATF-soaked # 600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked # 600 paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

   NOTE: The valve body is aluminum and doesn't require much polishing to remove any burrs.



5. Remove the # 600 paper. Thoroughly wash the entire valve body in solvent, then dry it with compressed air.
6. Coat the valve with ATF, then drop it into its bore. It should drop to the bottom of the bore under its own weight. If not, repeat step 4 and 5, then retest. If the valve still sticks, replace the valve body.



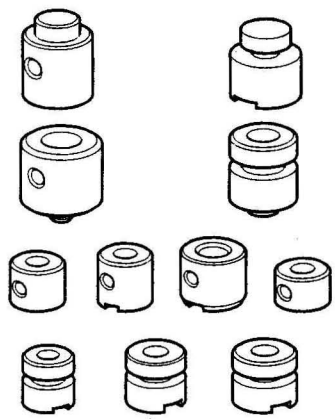
7. Remove the valve, and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

Protected by AR

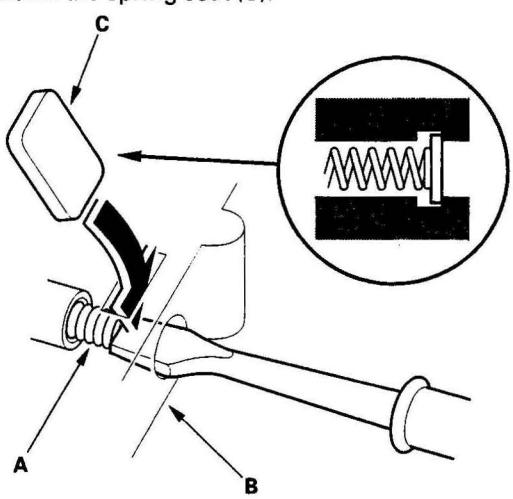
Valve Body Valve Installation

1. Coat all parts with ATF before assembly.

2. Install the valves and springs in the sequence shown for the main valve body (see page 14-171), regulator valve body (see page 14-174), and servo body (see page 14-175), Refer to the following valve cap illustrations, and install each valve cap so the end shown facing up will be facing the outside of the valve body.



3. Install all the springs and seats. Insert the spring (A) in the valve, then install the valve in the valve body (B). Push the spring in with a screwdriver, then install the spring seat (C).

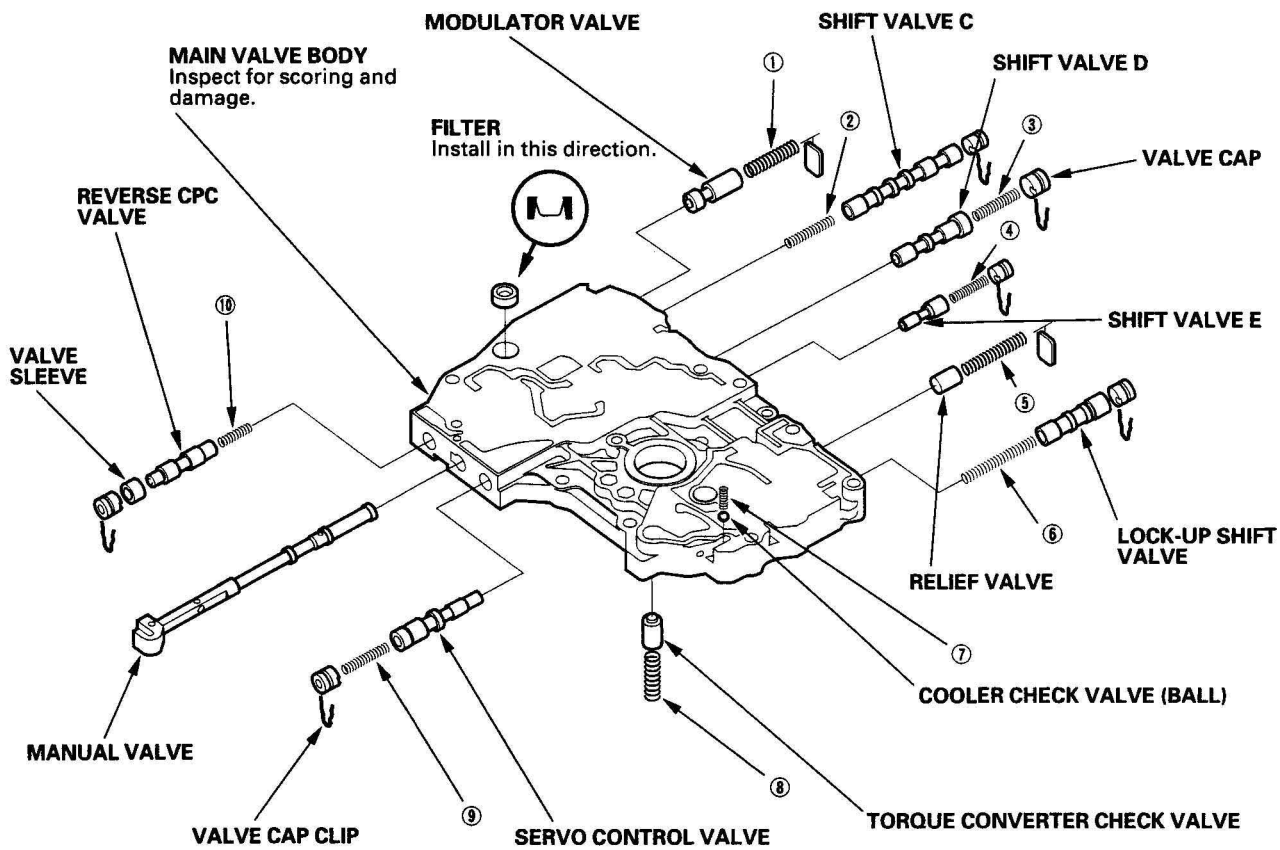


BACK

Protected by AR

Main Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Do not use a magnet to remove the check valve ball; it may magnetize the ball.
3. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-169).
4. Replace the valve body as an assembly if any parts worn or damaged.
5. Coat all parts with ATF during assembly.
6. Install the filter in the direction shown.

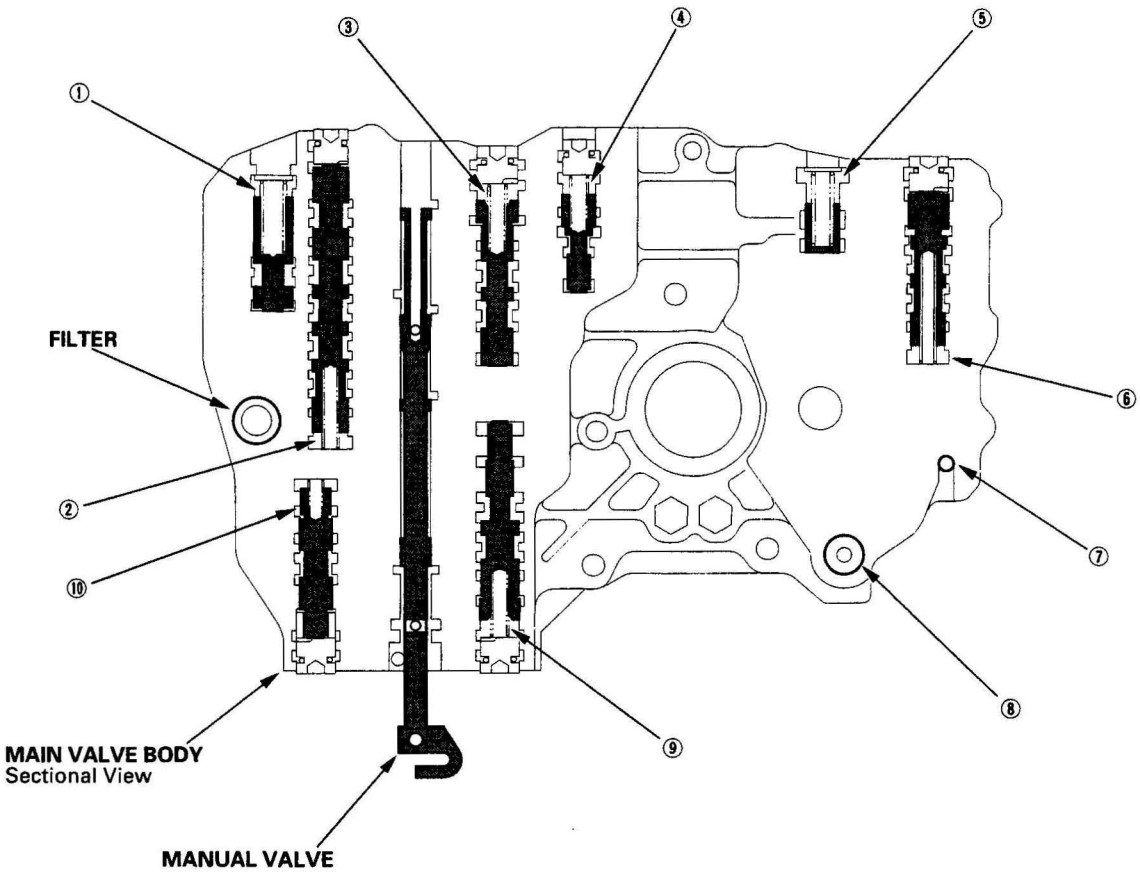


(cont'd)

Protected by AR

Main Valve Body Disassembly, Inspection, and Reassembly (cont'd)

Sectional View



SPRING SPECIFICATIONS

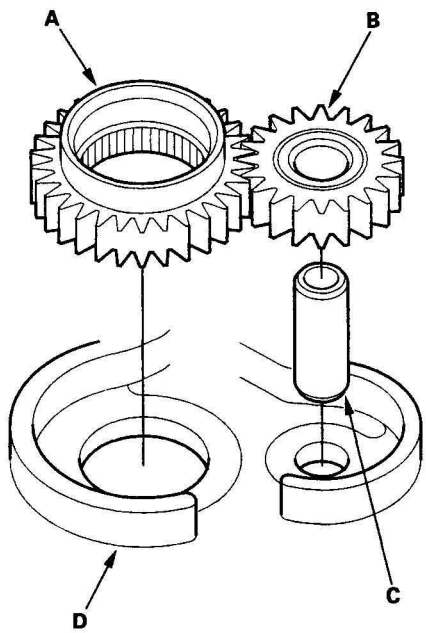
No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Modulator valve spring	1.6 (0.063)	10.4 (0.409)	33.5 (1.319)	9.8
②	Shift valve C spring	0.8 (0.031)	6.6 (0.260)	49.5 (1.949)	21.7
③	Shift valve D spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
④	Shift valve E spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
⑤	Relief valve spring	1.1 (0.043)	8.6 (0.339)	30.1 (1.185)	10.7
⑥	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	63.0 (2.480)	22.4
⑦	Cooler check valve spring	0.6 (0.024)	5.8 (0.228)	14.4 (0.567)	6.8
⑧	Torque converter check valve	1.2 (0.047)	8.6 (0.339)	34.4 (1.354)	11.7
⑨	Servo control valve spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
⑩	Reverse CPC valve spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9

BACK

Protected by AR

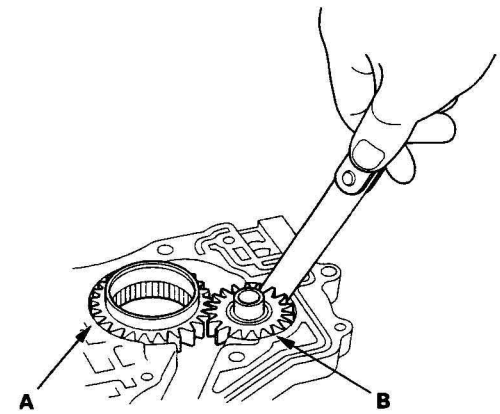
ATF Pump Inspection

1. Install the ATF pump drive gear (A), driven gear (B), and ATF pump driven gear shaft (C) in the main valve body (D). Lubricate all parts with ATF, and install the ATF pump driven gear with its grooved and chamfered side facing up.



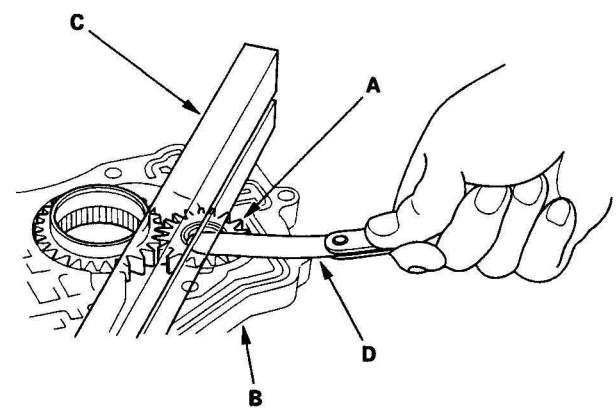
2. Measure the side clearance of the ATF pump drive gear (A) and driven gear (B).

ATF Pump Gears Side (Radial) Clearance:
Standard (New):
ATF Pump Drive Gear
0.210–0.265 mm (0.0083–0.00104 in.)
ATF Pump Driven Gear
0.070–0.125 mm (0.0028–0.0050 in.)



3. Remove the ATF pump driven gear shaft. Measure the thrust clearance between the ATF pump driven gear (A) and the valve body (B) with a straight edge (C) and a feeler gauge (D).

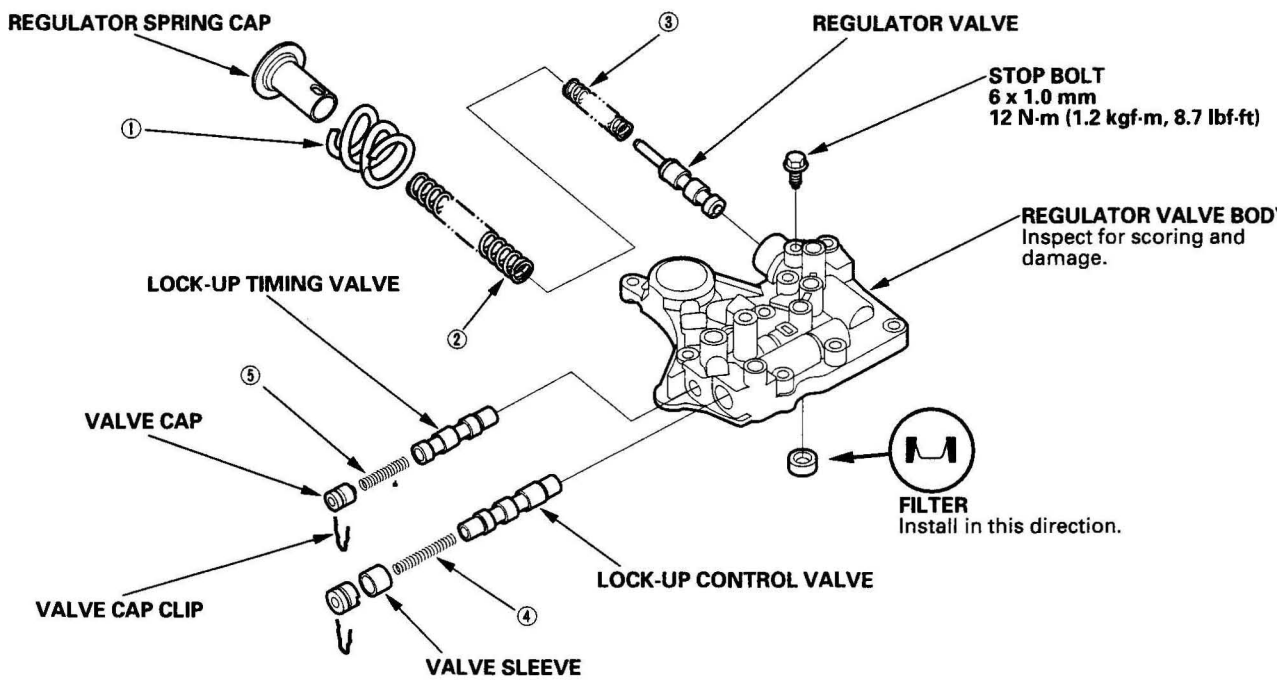
ATF Pump Drive/Driven Gear Thrust (Axial) Clearance:
Standard (New): 0.03–0.05 mm (0.001–0.002 in.)
Service Limit: 0.07 mm (0.003 in.)



Protected by AR

Regulator Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-169).
3. Replace the valve body as an assembly if any parts are worn or damaged.
4. Hold the regulator spring cap in place while removing the stop bolt. The regulator spring cap is spring loaded. Once the stop bolt is removed, release the spring cap slowly so it does not pop out.
5. Reassembly is the reverse of the disassembly. Install the filter in the direction shown.
6. Coat all parts with ATF during reassembly.
7. Align the hole in the regulator spring cap with the hole in the valve body, then press the spring cap into the valve body, and tighten the stop bolt.



SPRING SPECIFICATIONS

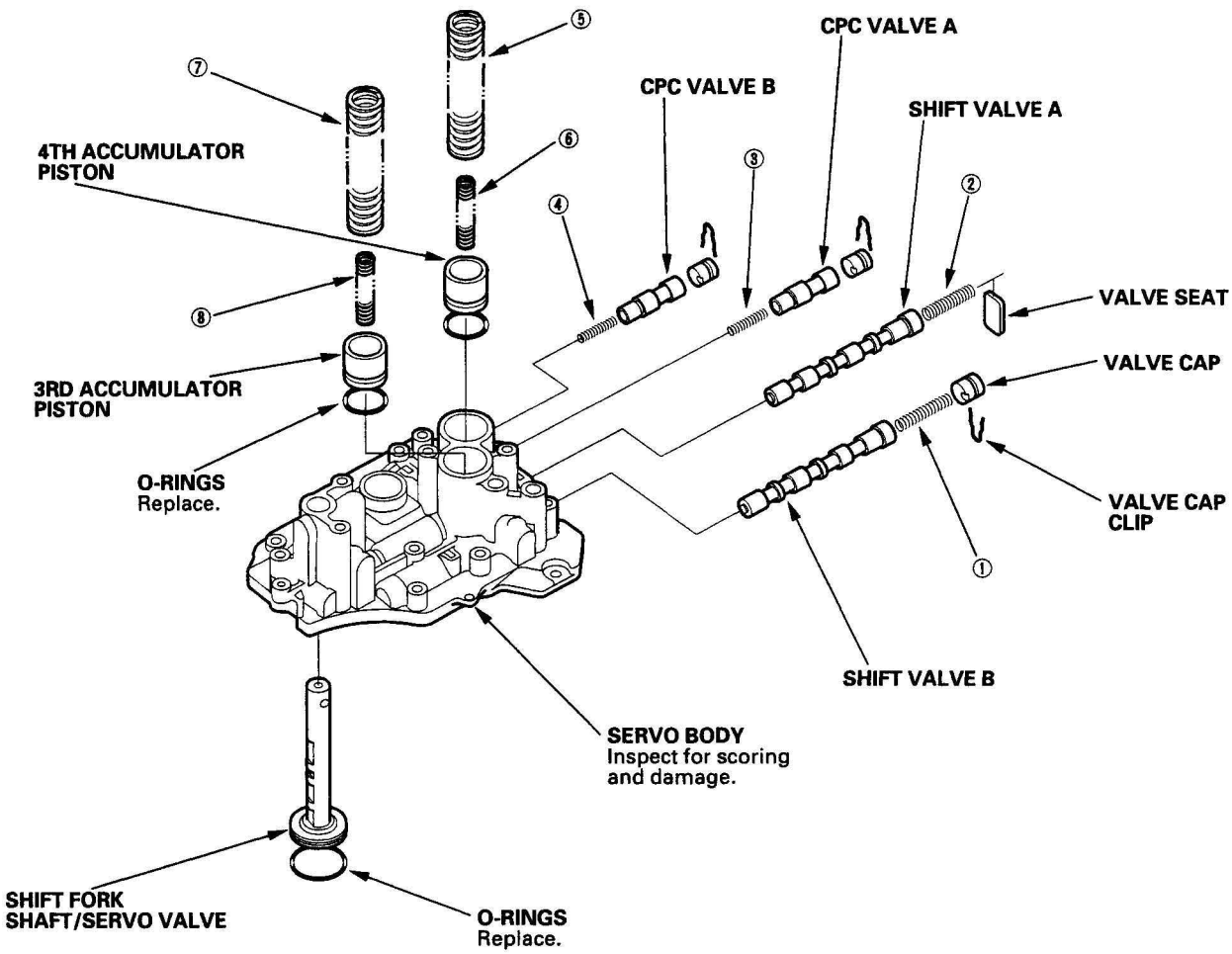
No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Stator reaction spring	5.5 (0.217)	37.4 (1.472)	30.3 (1.193)	2.12
②	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	77.4 (3.047)	15.2
③	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
④	Lock-up control valve spring	0.8 (0.031)	6.6 (0.260)	44.3 (1.744)	25.5
⑤	Lock-up timing valve spring	0.65 (0.026)	6.6 (0.260)	34.8 (1.370)	15.6

BACK

Protected by AR

Servo Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-169).
3. Replace the valve body as an assembly if any parts are worn or damaged.
4. Coat all parts with ATF during reassembly.



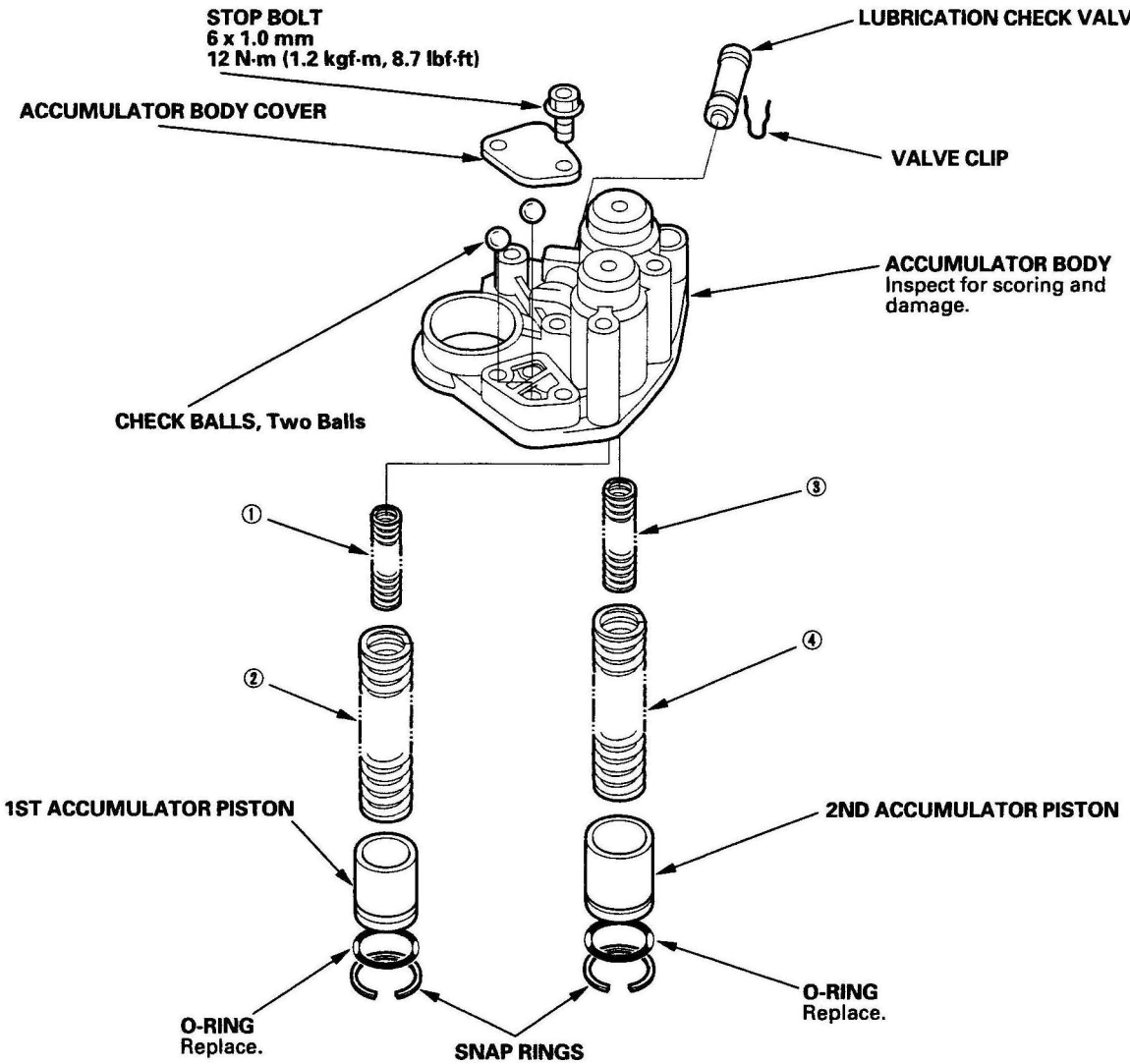
SPRING SPECIFICATIONS

No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Shift valve B spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
②	Shift valve A spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
③	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
④	CPC valve B spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
⑤	4th accumulator spring A	2.6 (0.102)	19.6 (0.772)	66.4 (2.614)	9.7
⑥	4th accumulator spring B	2.4 (0.094)	12.8 (0.504)	51.5 (2.028)	11.5
⑦	3rd accumulator spring A	2.6 (0.102)	19.6 (0.772)	66.4 (2.614)	9.7
⑧	3rd accumulator spring B	2.4 (0.094)	12.8 (0.504)	51.5 (2.028)	11.5

Protected by AR

Accumulator Body Disassembly, Inspection, and Reassembly

1. Do not use a magnet to remove the check balls; it may magnetize the balls.
2. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
3. Coat all parts with ATF during reassembly.



SPRING SPECIFICATIONS

No.	Springs	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1st accumulator spring B	2.7 (0.106)	14.8 (0.583)	52.5 (2.067)	11.3
②	1st accumulator spring A	2.6 (0.102)	21.6 (0.850)	80.5 (3.169)	11.2
③	2nd accumulator spring B	2.4 (0.094)	12.6 (0.496)	53.5 (2.106)	12.9
④	2nd accumulator spring A	2.7 (0.106)	19.6 (0.772)	66.3 (2.610)	9.9

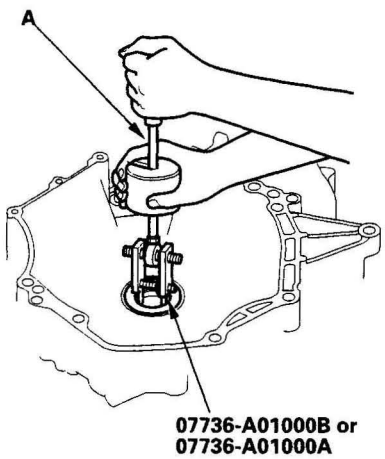
BACK

Protected by AR

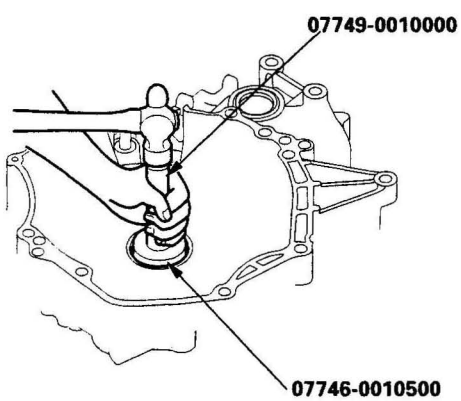
Mainshaft Bearing and Oil Seal Replacement

Special Tools Required
- Adjustable bearing puller, 25 – 40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500
- Attachment, 72 x 75 mm 07746-0010600

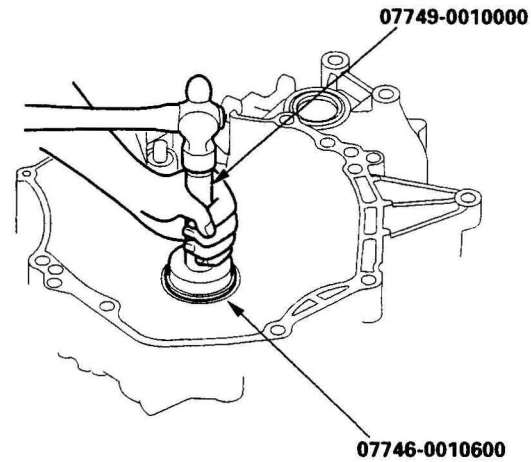
1. Remove the mainshaft bearing and oil seal with the special tool and a commercially available 3/8''-16 slide hammer(A).



2. Install the new mainshaft bearing until it bottoms in the housing with the special tools.



3. Install the new oil seal flush with the housing with the special tools.

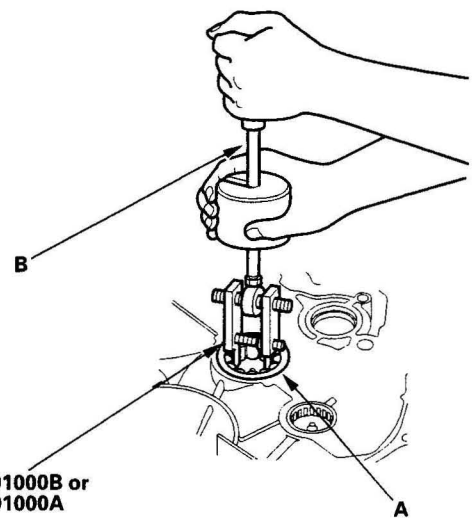


Protected by AR

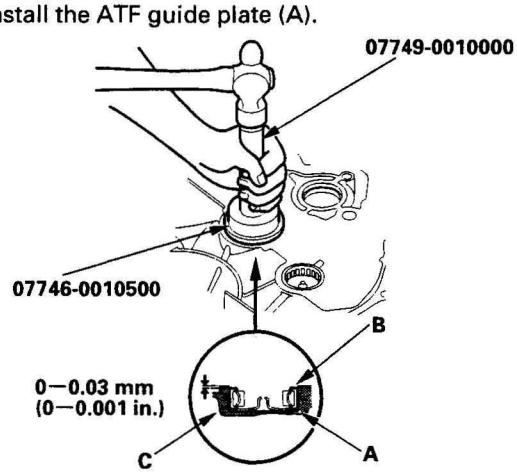
Countershaft Bearing Replacement

Special Tools Required
- Adjustable bearing puller, 25—40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

1. Remove the countershaft bearing (A) with the special tool and a commercially available 3/8″-16 slide hammer (B).



2. Install the ATF guide plate (A).

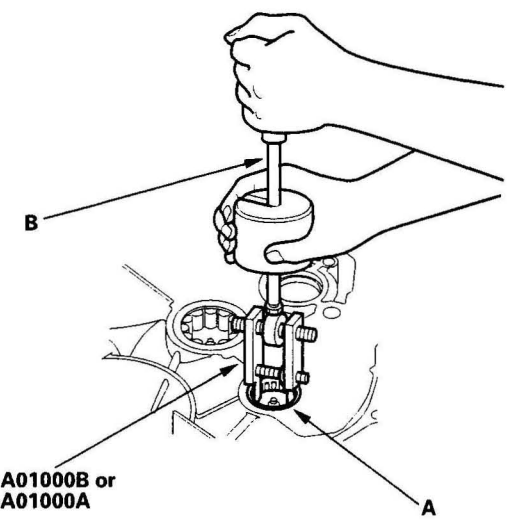


3. Install the new bearing (B) into the housing (C) with the special tools.

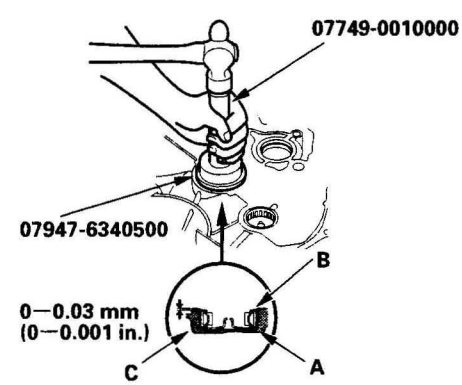
Secondary Shaft Bearing Replacement

Special Tools Required
- Adjustable bearing puller, 25—40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Driver Attachment 07947-6340500

1. Remove the secondary shaft bearing (A) with the special tool and a commercially available 3/8″-16 slide hammer (B).



2. Install the ATF guide plate (A).



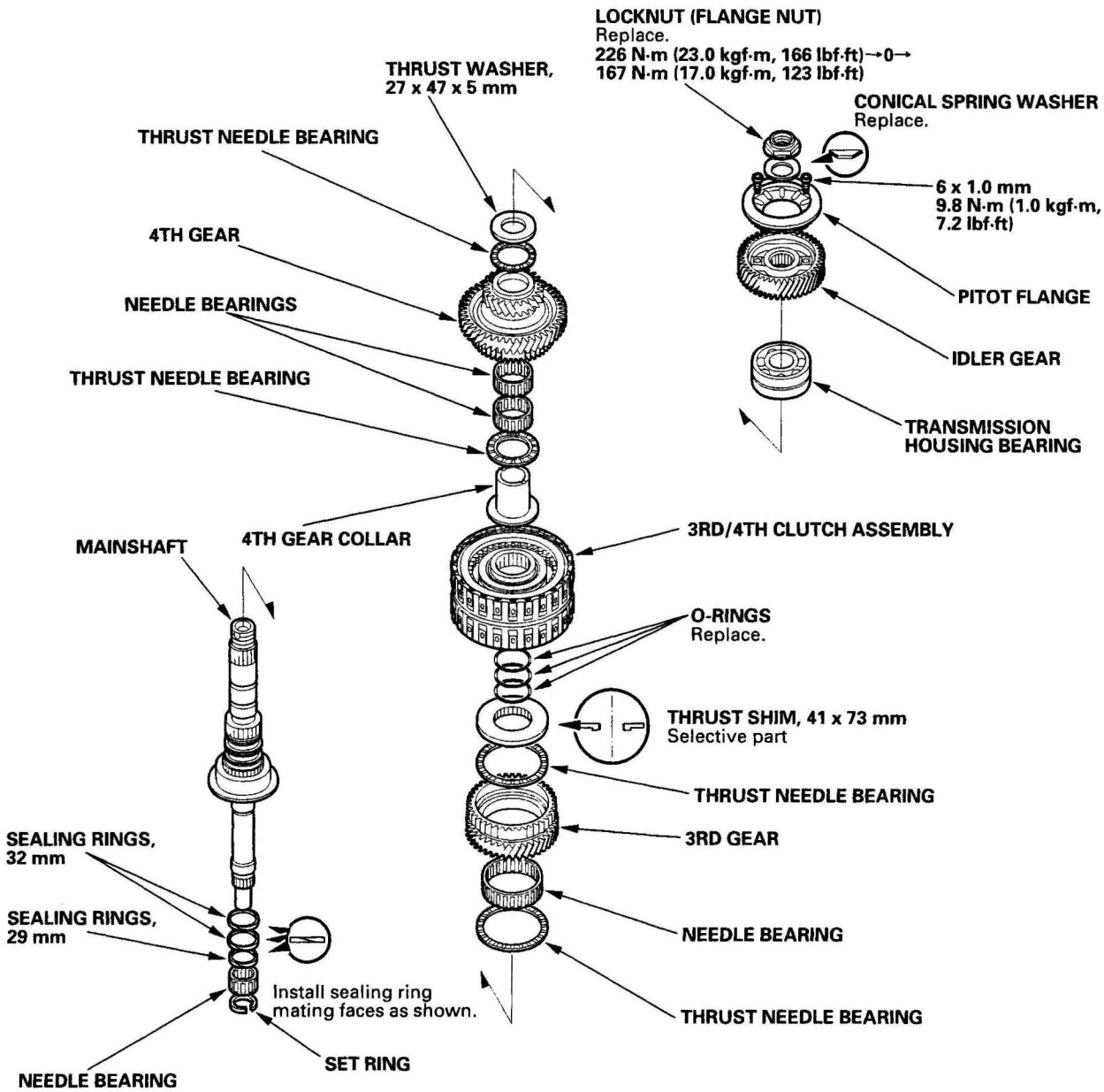
3. Install the new bearing (B) into the housing (C) with the special tools.

BACK

Protected by AR

Mainshaft Disassembly, Inspection, and Reassembly

1. Lubricate all parts with ATF during reassembly.



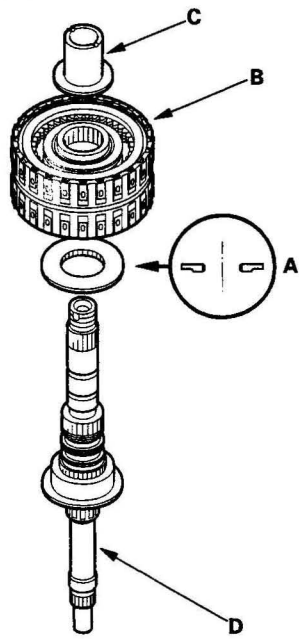
2. Check the clearance of the 3rd/4th clutch assembly.
3. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
4. Inspect the splines for excessive wear and damage.
5. Check shaft bearing surfaces for scoring and excessive wear.
6. Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.
7. Install the conical spring washer in the direction shown.
8. Inspect condition of the sealing rings. If the sealing rings are worn, distorted, or damaged, replace them (see page 14-181).

BACK

Protected by AR

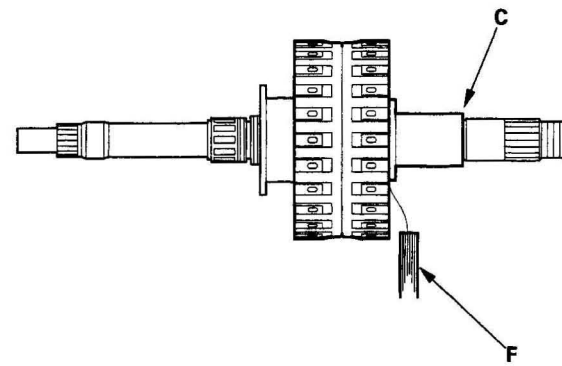
3rd/4th Clutch Clearance Inspection

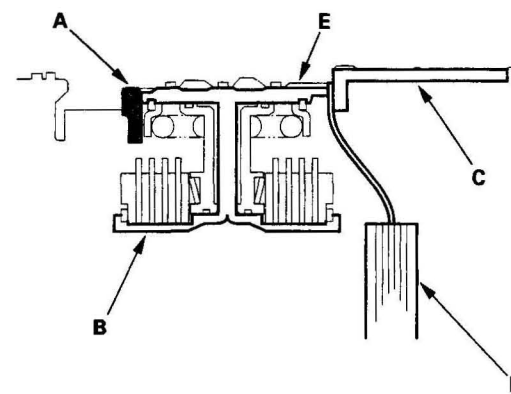
1. Remove the O-rings from the mainshaft.
2. Assemble the 41 x 73 mm thrust shim (A), 3rd/4th clutch assembly (B), and 4th gear collar (C) on the mainshaft (D).



3. Hold the 4th gear collar (C) against the clutch assembly (B), then measure the clearance between the clutch guide (E) and the 4th gear collar with a feeler gauge (F) in at least three places. Use the average as the actual clearance.

STANDARD: 0.03—0.11 mm (0.001—0.004 in.)





4. If the clearance is out of standard, remove the thrust shim and measure its thickness.
5. Select and install a new shim, then recheck.

THRUST SHIM, 41 x 73 mm

No.	Part Number	Thickness
1	90414-P7T-000	7.85 mm (0.309 in.)
2	90415-P7T-000	7.90 mm (0.311 in.)
3	90416-P7T-000	7.95 mm (0.313 in.)
4	90417-P7T-000	8.00 mm (0.315 in.)
5	90418-P7T-000	8.05 mm (0.317 in.)
6	90419-P7T-000	8.10 mm (0.319 in.)

6. After replacing the thrust shim, make sure the clearance is within standard.

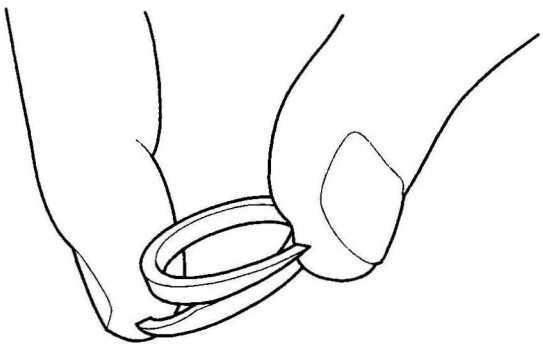
BACK

Protected by AR

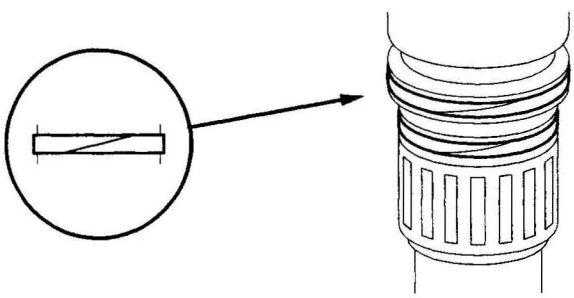
Mainshaft Sealing Rings Replacement

The sealing rings are synthetic resin with chamfered ends. Check the condition of the sealing rings, and replace them only if they are worn, distorted, or damaged.

1. For a better fit, squeeze sealing rings together slightly before installing them.



2. Apply ATF to the new sealing rings then install them on the mainshaft.



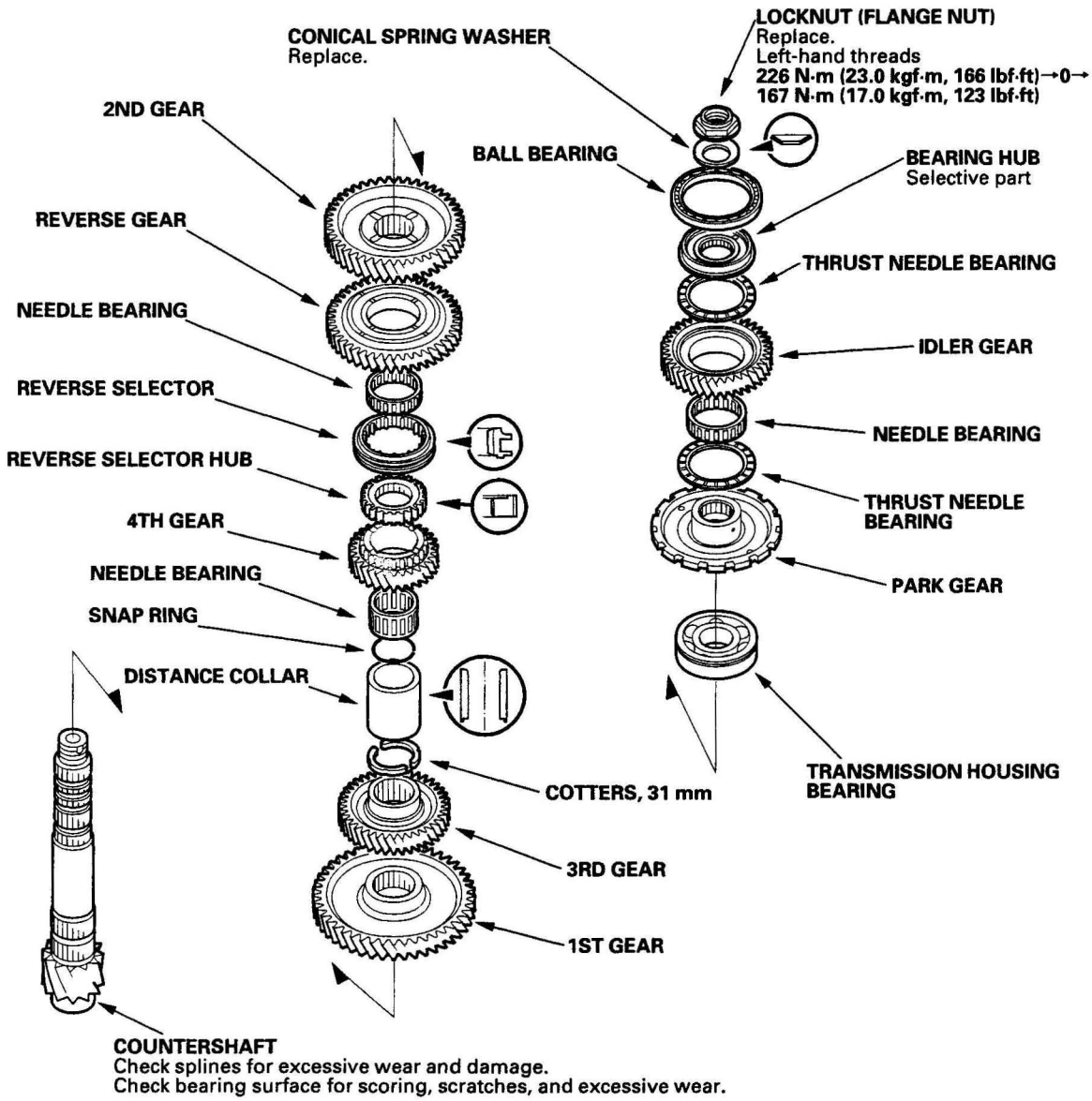
3. After installing the sealing rings, verify the following:

   - The rings are fully seated in the groove.
   - The rings are not twisted.
   - The chamfered ends of the rings are properly joined.

Protected by AR

Countershaft Disassembly, Inspection, and Reassembly

1. Remove the locknut, and take off components down to the reverse selector hub.



2. Remove the reverse selector hub, 3rd gear, and 1st gear (see page 14-183).
3. Check the bearing in the bearing hub for wear and rough movement. If the bearing is worn or damaged, replace it (see page 14-185).
4. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
5. Check the splines for excessive wear and damage.
6. Check the shaft bearing surfaces for scoring and excessive wear.
7. Lubricate all parts with ATF, and reassemble the shafts and gears.
8. Install the conical spring washer in the direction shown.

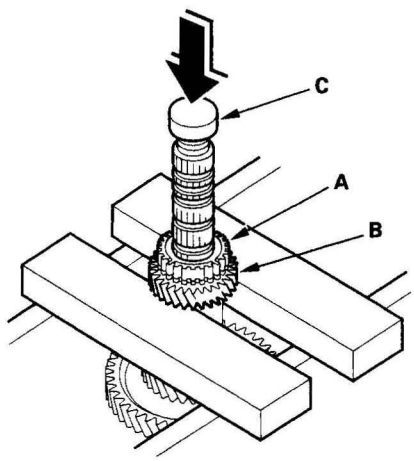
BACK

Protected by AR

Countershaft Reverse Selector Hub and 3rd Gear Removal

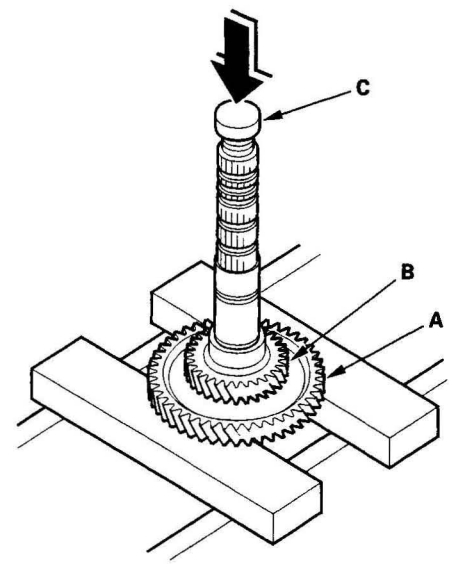
1. Remove the reverse selector hub (A) and the 4th gear (B) from the countershaft with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the countershaft.

   NOTE: Some reverse selector hubs are not press-fitted, and can be removed without using a press.



2. Remove the needle bearing, snap ring, distance collar, and 31 mm cotters from the countershaft.

3. Remove the 1st gear (A) and 3rd gear (B) together from the countershaft with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the countershaft.

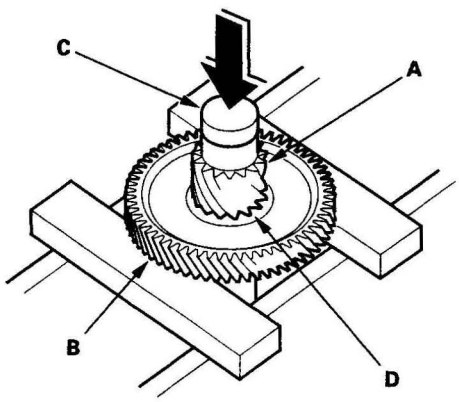


Protected by AR

Countershaft Reverse Selector Hub and 3rd Gear Installation

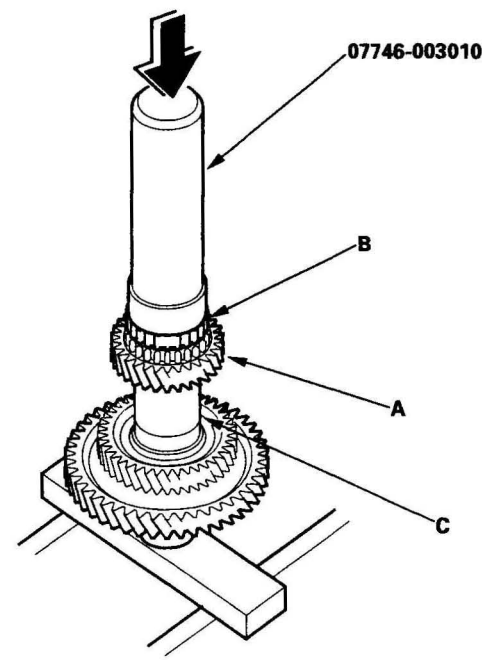
Special Tool Required
Driver, 40 mm I.D. 07746-0030100

1. Apply ATF to the parts.
2. Align the shaft splines with those on 1st gear, then press the countershaft (A) into the 1st gear (B) with a press.
   - Place an attachment (C) between the press and countershaft to prevent damaging the countershaft.
   - Stop pressing the countershaft when the 1st gear contacts the final drive gear (D).



3. Align the shaft splines with those on 3rd gear, then press the countershaft into the 3rd gear with a press.
   - Place an attachment between the press and countershaft to prevent damaging the countershaft.
   - Stop pressing the countershaft when the 3rd gear contacts the 1st gear.
4. Install the 31 mm cotters, distance collar, snap ring, needle bearing, and 4th gear (A) on the countershaft.
5. Slide the reverse selector hub (B) over the countershaft (C), and then press it into place with the special tool and a press.

   NOTE: Some reverse selector hubs are not press-fitted and can be installed without using the special tool and a press.



BACK

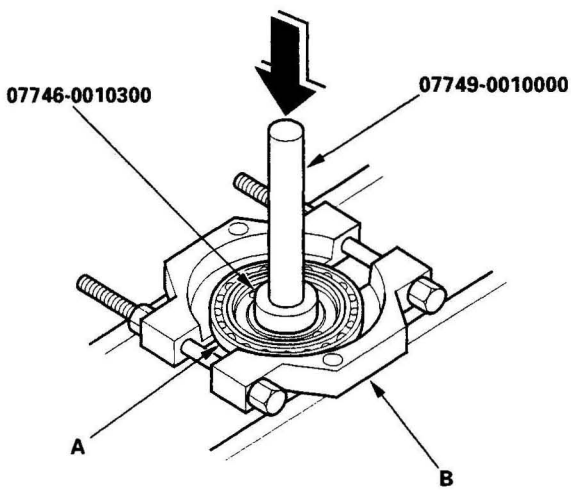
Protected by AR

Countershaft Bearing Hub/Bearing Replacement

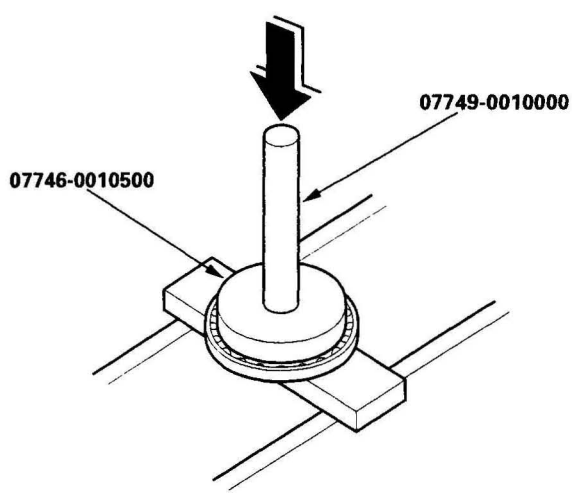
Special Tools Required
- Driver 07749-0010000
- Attachment, 42 x 47 mm 07746-0010300
- Attachment, 62 x 68 mm 07746-0010500

1. Check the bearing for wear, damage, and rough movement. If the bearing is worn or damaged, replace it.

2. Remove the bearing (A) from the bearing hub with the special tools, a bearing separator (B) and a press.



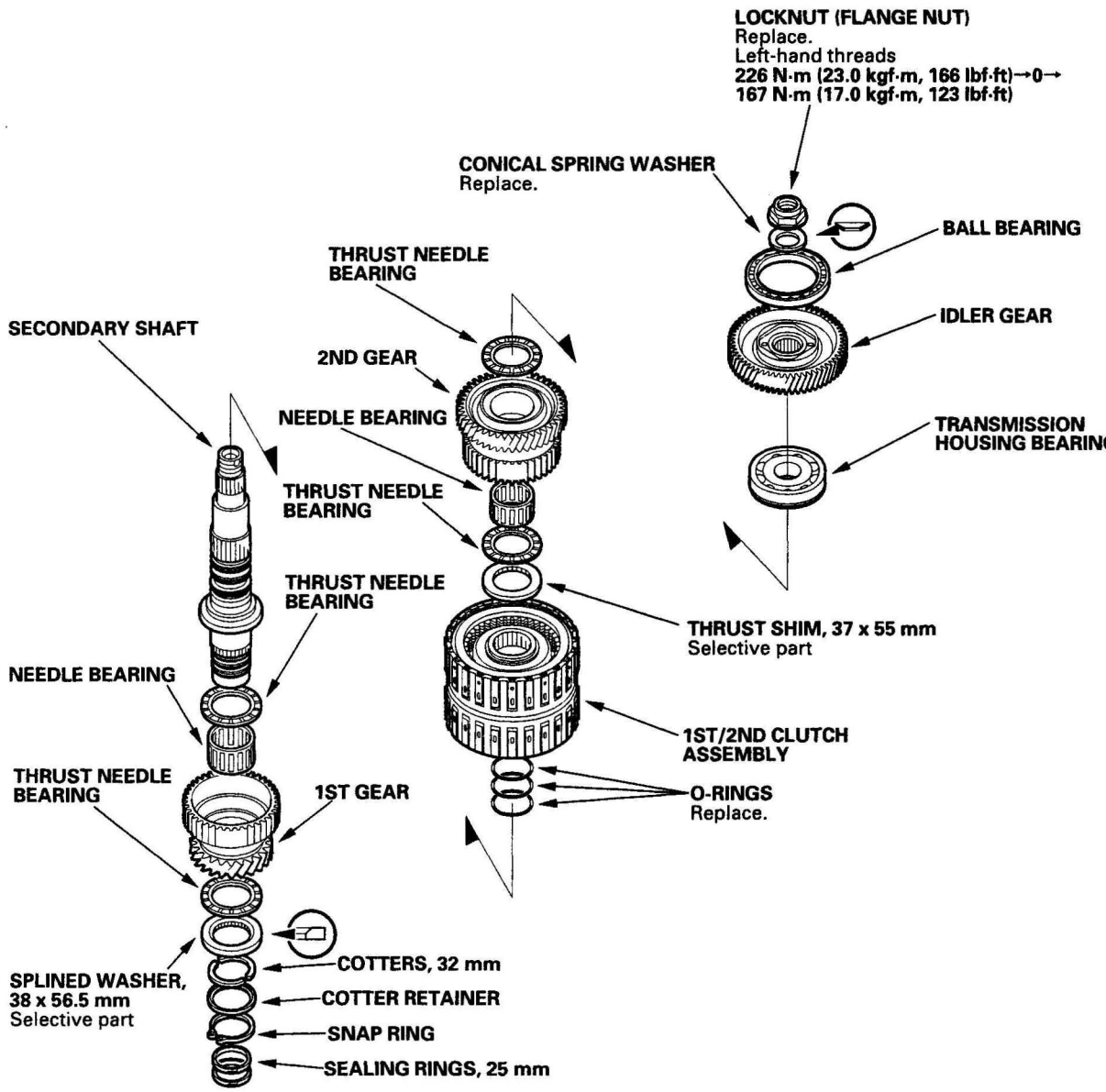
3. Install the new bearing on the bearing hub with the special tools and a press.



Protected by AR

Secondary Shaft Disassembly, Inspection, and Reassembly

1. Remove the locknut, and disassemble the shaft and gears.



2. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
3. Check clearance of the secondary shaft assembly.
4. Check the splines for excessive wear and damage.
5. Check the shaft bearing surfaces for scoring and excessive wear.
6. Check the idler gear bearing for wear and rough movement. If the bearing is worn or damaged, replace it (see page 14-189).
7. Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.
8. Lubricate all parts with ATF during reassembly.
9. Install the conical spring washer in the direction shown.

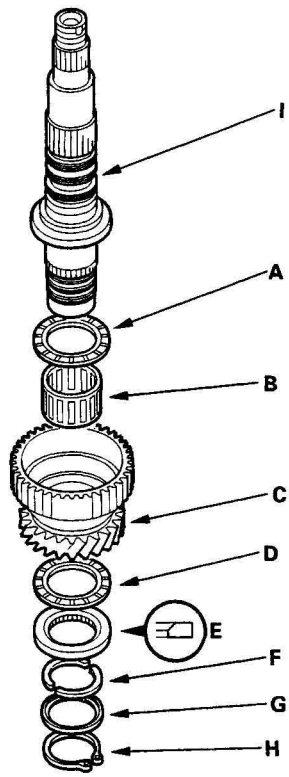
BACK

Protected by AR

Secondary Shaft Clearance Inspection

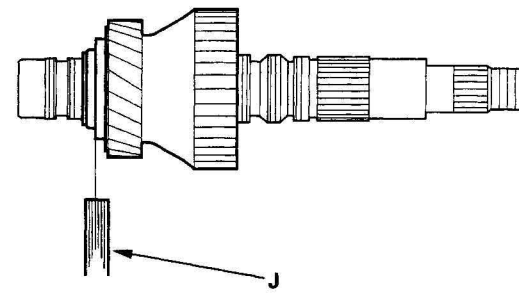
1. Remove the O-rings from the shaft.

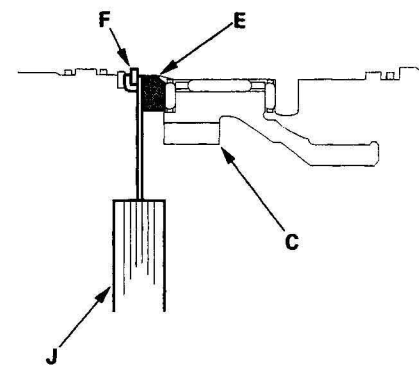
2. Assemble the thrust needle bearing (A), needle bearing (B), 1st gear (C), thrust needle bearing (D), 38 x 56.5 mm splined washer (E), 32 mm cotters (F), cotter retainer (G), and snap ring (H) on the secondary shaft (I).



3. Measure the clearance between the 38 x 56.5 mm splined washer (E) and cotters (F) with a feeler gauge (J) in at least three places. Use the average as the actual clearance.

STANDARD: 0.07 – 0.15 mm (0.003 – 0.006 in.)





4. If the clearance is out of standard, remove the splined washer, and measure its thickness.

5. Select and install a new splined washer, then recheck.

SPLINED WASHER, 38 x 56.5 mm

No.	Part Number	Thickness
1	90502-P0Z-000	6.85 mm (0.270 in.)
2	90503-P0Z-000	6.90 mm (0.272 in.)
3	90504-P0Z-000	6.95 mm (0.274 in.)
4	90505-P0Z-000	7.00 mm (0.276 in.)
5	90506-P0Z-000	7.05 mm (0.278 in.)
6	90507-P0Z-000	7.10 mm (0.280 in.)

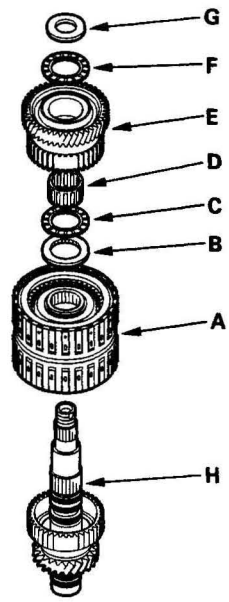
(cont'd)

Protected by AR

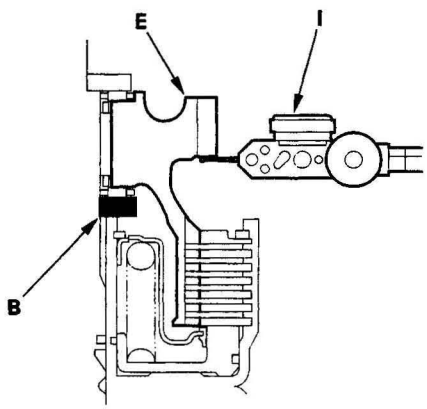
Secondary Shaft Clearance Inspection (cont'd)

6. Remove the 27 x 47 x 5 mm thrust washer from the mainshaft.

7. Assemble the 1st/2nd clutch assembly (A), 37 x 55 mm thrust shim (B), thrust needle bearing (C), needle bearing (D), 2nd gear (E), thrust needle bearing (F), and 27 x 47 x 5 mm thrust washer (removed from mainshaft) (G) on the secondary shaft (H).

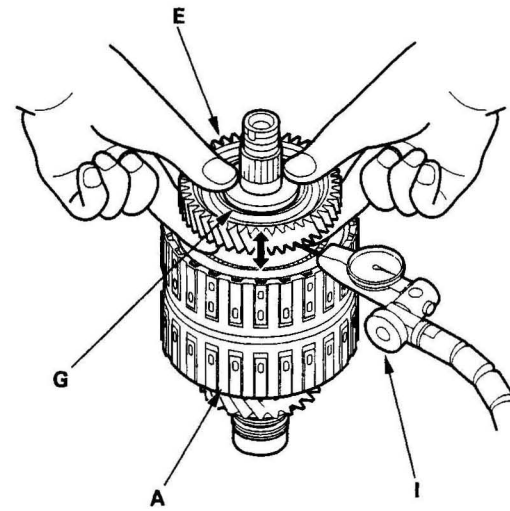


8. Set the dial indicator (I) on 2nd gear (E).



9. Hold the 27 x 47 x 5 mm thrust washer (G) against the clutch assembly (A), and measure the 2nd gear axial clearance in at least three places while moving the 2nd gear (E). Use the average as the actual clearance.

STANDARD: 0.04—0.12 mm (0.002—0.005 in.)



10. If the clearance is out of standard, remove the 37 x 55 mm thrust shim and measure its thickness.

11. Select and install a new thrust shim, then recheck.

THRUST SHIM, 37 x 55 mm

No.	Part Number	Thickness
1	90406-P0Z-000	4.90 mm (0.193 in.)
2	90407-P0Z-000	4.95 mm (0.195 in.)
3	90408-P0Z-000	5.00 mm (0.197 in.)
4	90409-P0Z-000	5.05 mm (0.199 in.)
5	90410-P0Z-000	5.10 mm (0.201 in.)
6	90411-P0Z-000	5.15 mm (0.203 in.)
7	90412-P0Z-000	5.20 mm (0.205 in.)

12. Disassemble the shaft and gears.

13. Reinstall the 27 x 47 x 5 mm thrust washer on the mainshaft.

BACK

Protected by AR

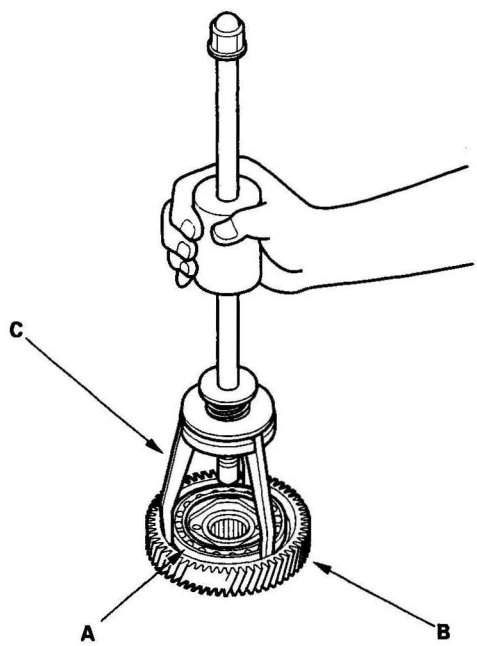
Secondary Shaft Idler Gear Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

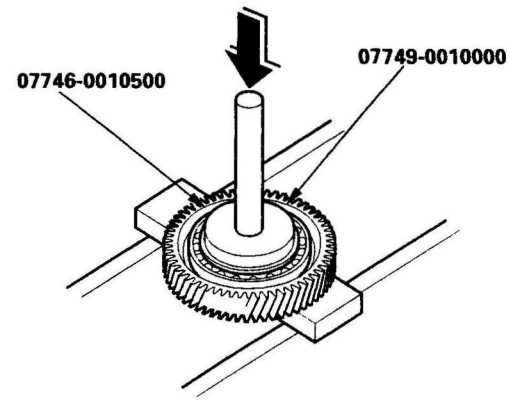
1. Check the bearing for wear, damage, and rough movement. If the bearing is worn or damaged, go to step 2.

2. Place the secondary shaft idler gear in a vise with soft jaws.

3. Remove the bearing (A) from the secondary shaft idler gear (B) with a commercially available, 3-jaw slide hammer (C).



4. Install the bearing on the secondary shaft idler gear with the special tool and a press.

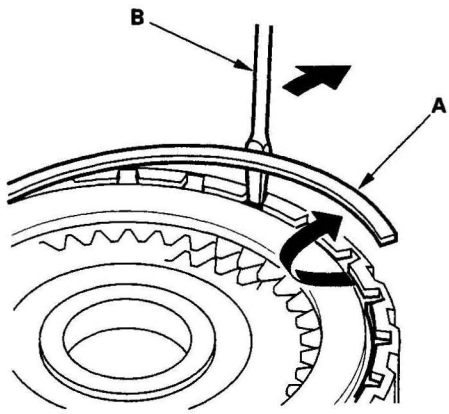


Protected by AR

Clutch Disassembly

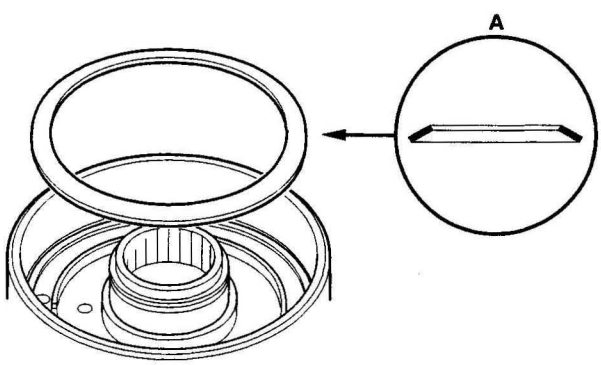
Special Tools Required
- Clutch spring compressor attachment 07LAE-PX40100
- Clutch spring compressor attachment 07HAE-PL50101
- Clutch spring compressor bolt assembly 07GAE-PG40200 or 07GAE-PG4020A

1. Remove the snap ring (A), then remove the clutch end plate, the clutch discs, and the plates with a screwdriver (B).

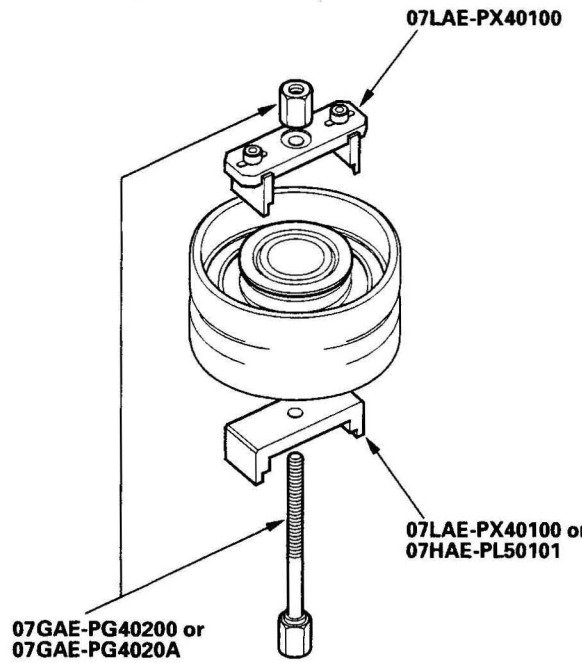


2. Remove the disc spring (A) from the 1st, 3rd, and 4th clutches.

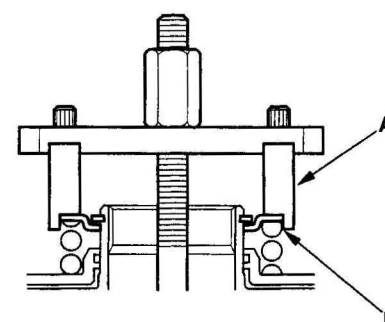
   NOTE: The 2nd clutch does not have a disc spring.



3. Install the special tools on the 3rd/4th clutch assembly.



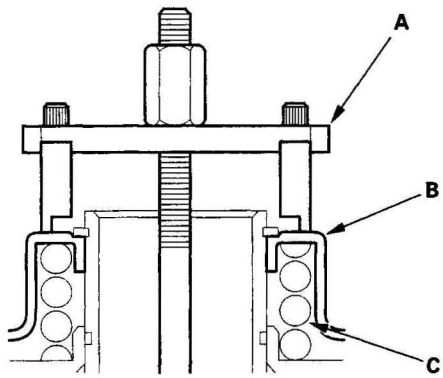
4. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 3rd and 4th clutches.



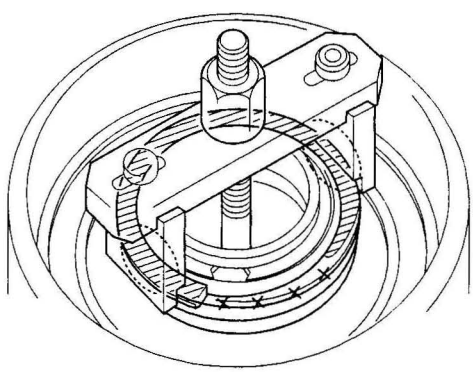
BACK

Protected by AR

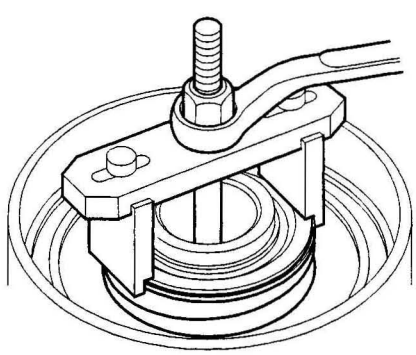
5. Set the special tool (A) on the spring retainer (B) of the 1st and 2nd clutches in such a way that the special tool works on the clutch return spring (C).



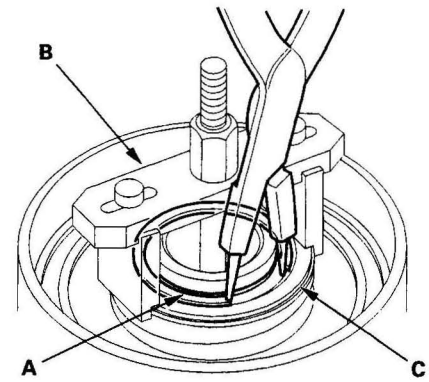
6. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



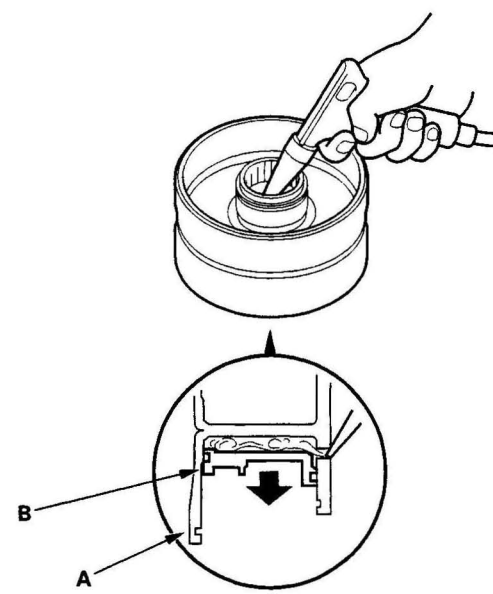
7. Compress the spring until the snap ring can be removed.



8. Remove the snap ring (A). Then remove the special tool (B), spring retainer (C), and return spring.



9. For 3rd and 4th clutch: Wrap a shop rag around the clutch drum (A), and apply air pressure to the fluid passage to remove the piston (B). Place a finger tip on the other end while applying air pressure.

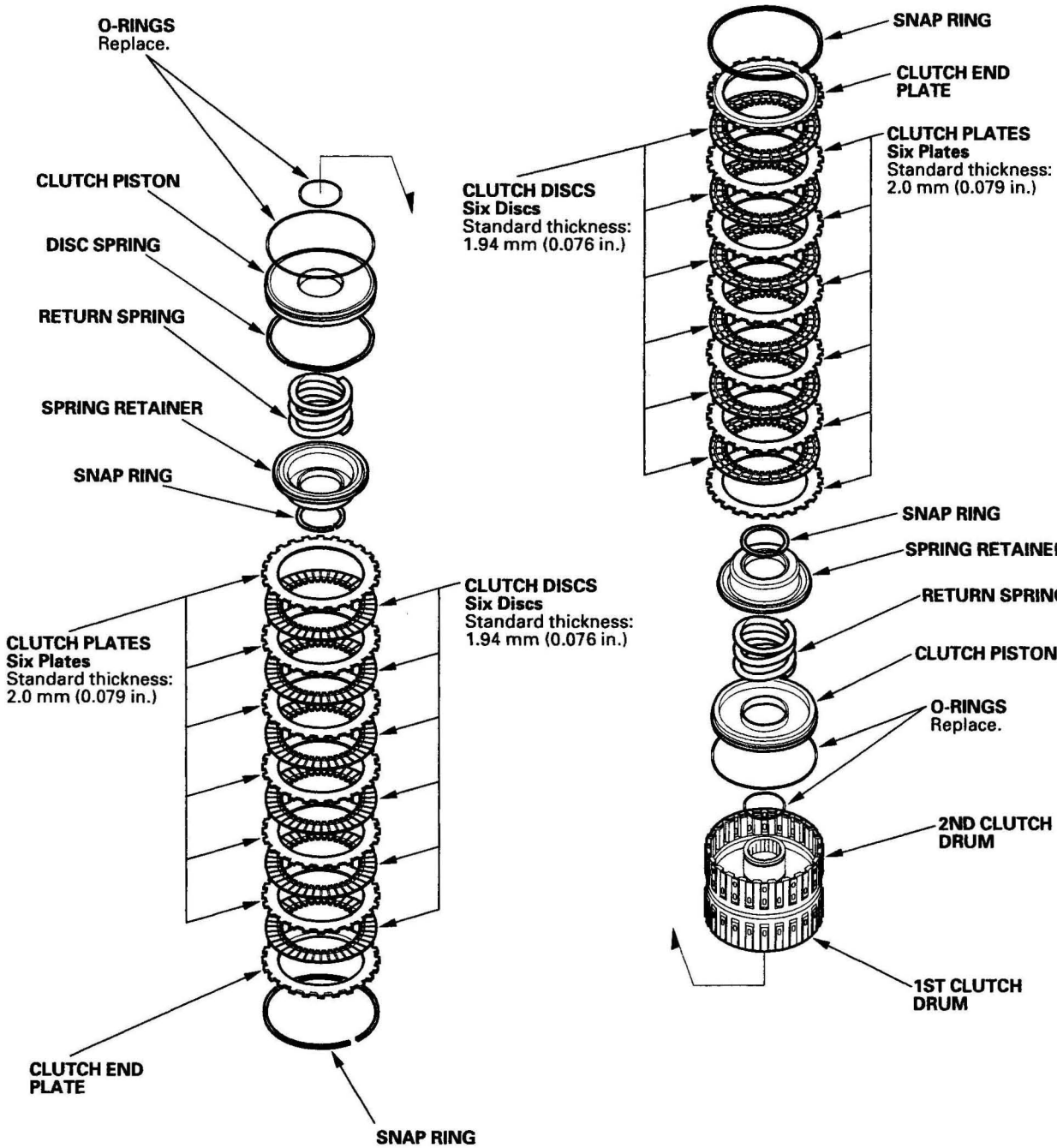


BACK

Protected by AR

Clutch Inspection

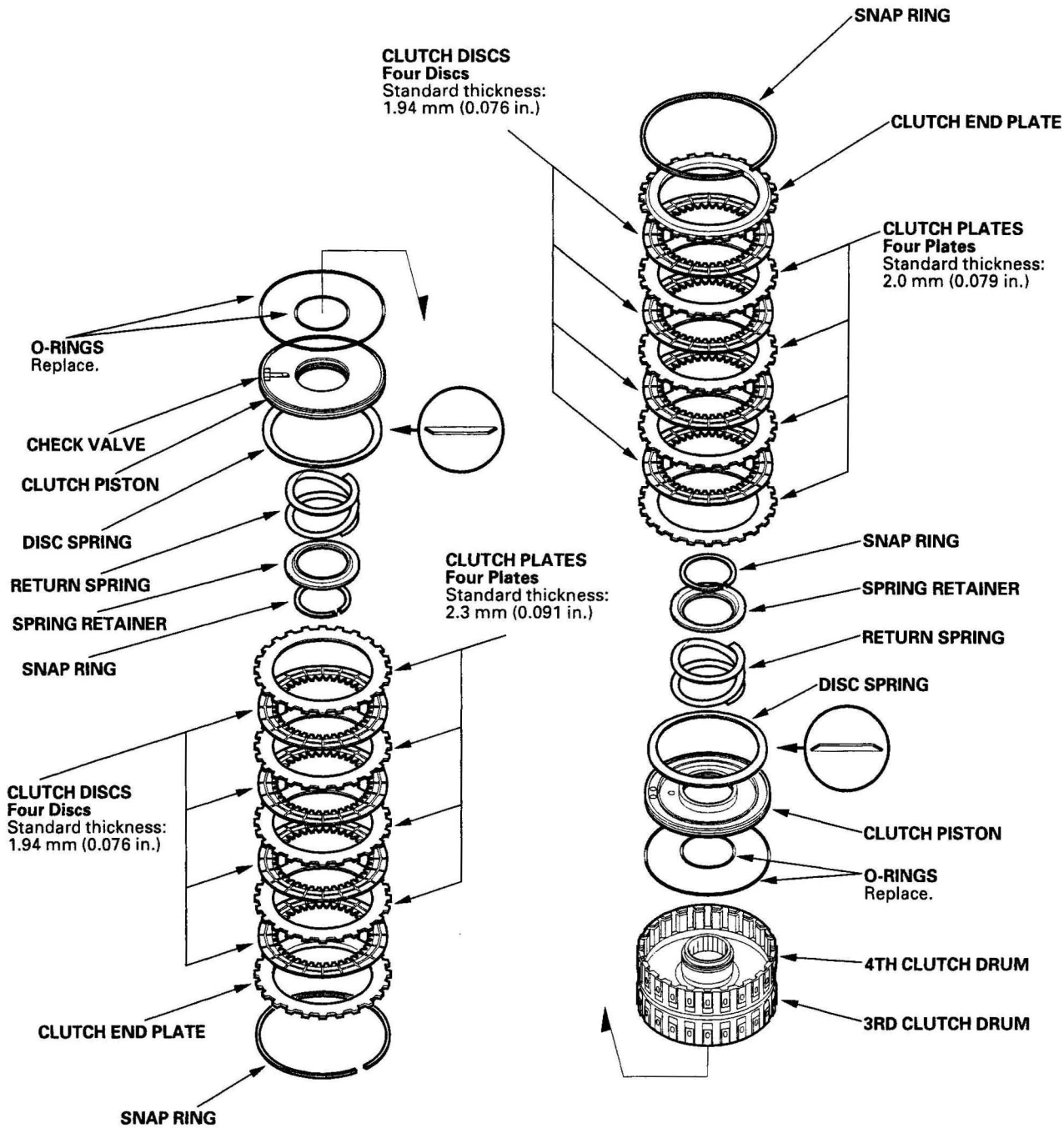
1ST/2ND CLUTCH



BACK

Protected by AR

3RD/4TH CLUTCH



BACK

Protected by AR

Clutch Reassembly

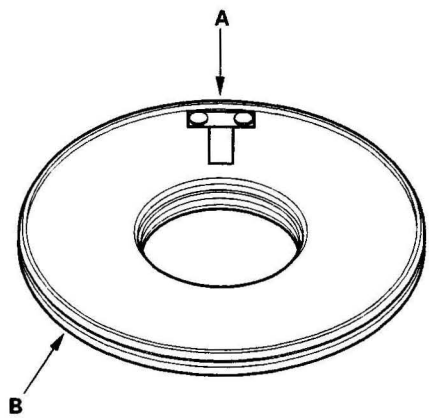
Special Tools Required
- Clutch spring compressor attachment 07LAE-PX40100
- Clutch spring compressor attachment 07HAE-PL50101
- Clutch spring compressor bolt assembly 07GAE-PG40200 or 07GAE-PG4020A
- Clutch compressor attachment 07ZAE-PRP0100

Note these items during reassembly:

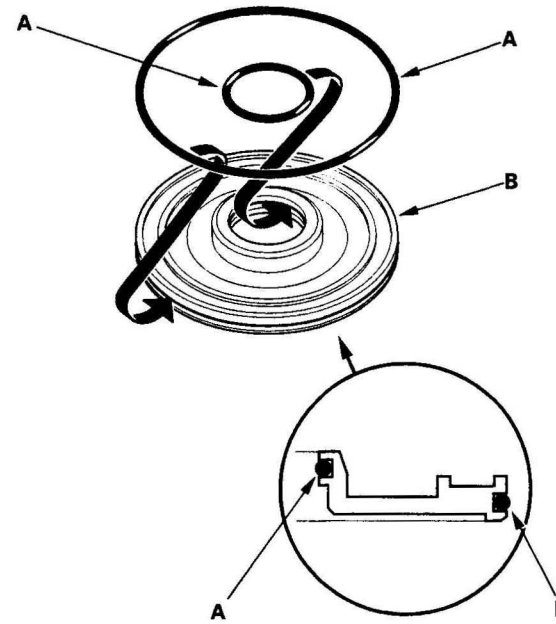
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air.
- Blow out all passages.
- Apply ATF to all parts before assembly.

1. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.

2. Inspect the check valve (A) on the 3rd and 4th clutch pistons (B); if it's loose or stuck, replace the piston.

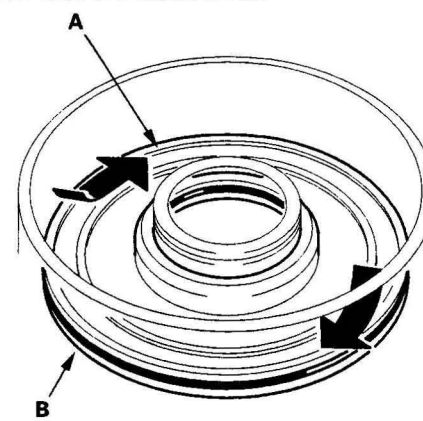


3. Install new O-rings (A) on the piston (B).



4. Install the piston (A) in the clutch drum (B). Apply pressure and rotate to ensure proper seating. Lubricate the piston O-ring with ATF before installing.

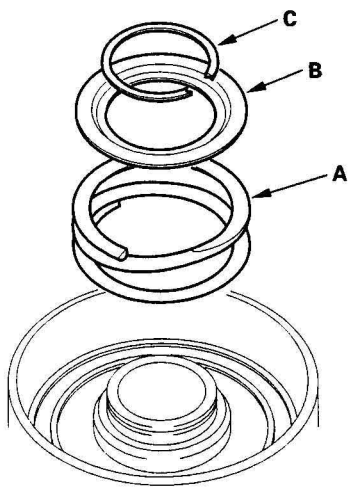
   NOTE: Do not pinch the O-ring by installing the piston with too much force.



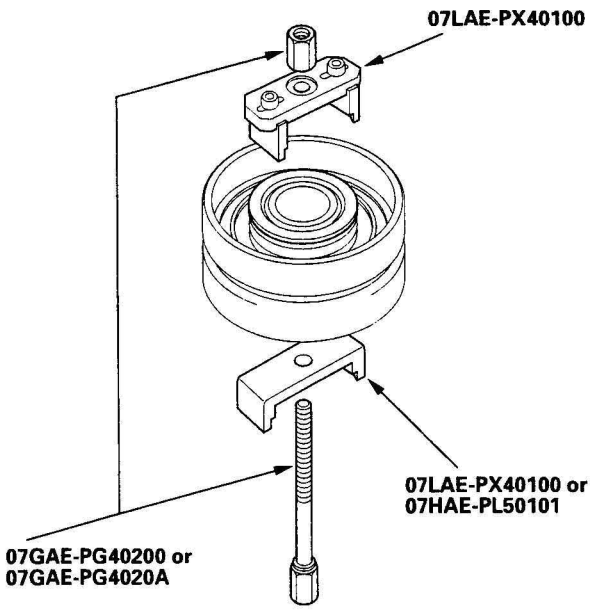
BACK

Protected by AR

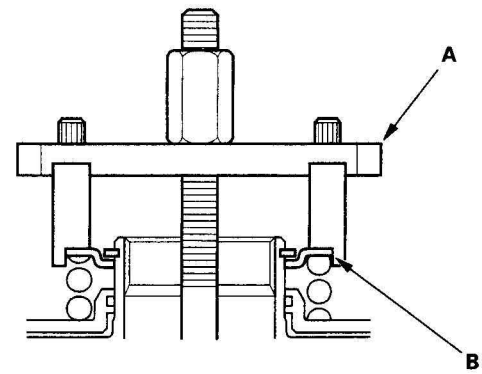
5. Install the return spring (A) and spring retainer (B), and position the snap ring (C) on the retainer.



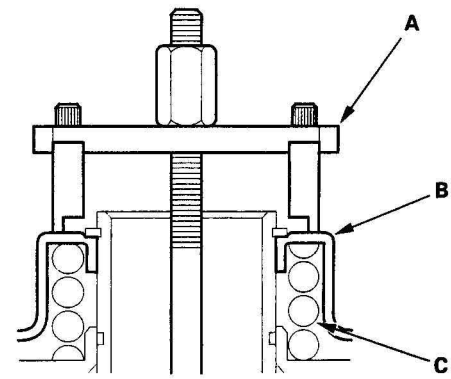
6. Install the special tools on the 3rd/4th clutch assembly.



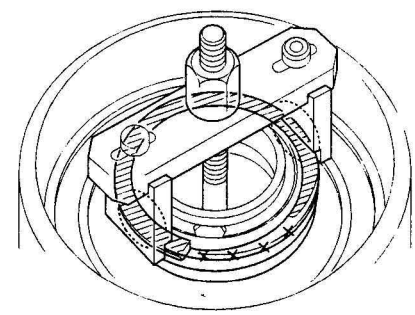
7. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 3rd and 4th clutches.



8. Set the special tool (A) on the spring retainer (B) of the 1st and 2nd clutches in such a way that the special tool work on the clutch return spring (C).



9. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.

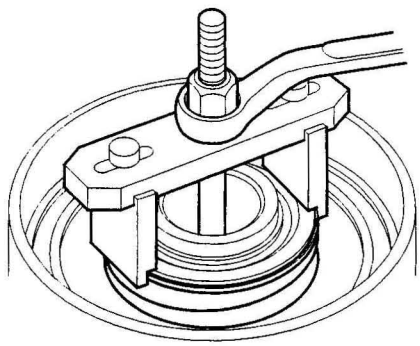


(cont'd)

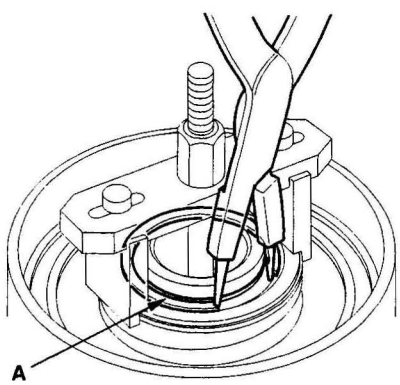
Protected by AR

Clutch Reassembly (cont'd)

10. Compress the return spring.



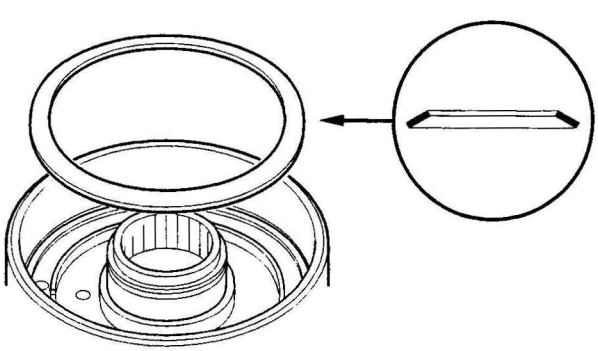
11. Install the snap ring (A).



12. Remove the special tools.

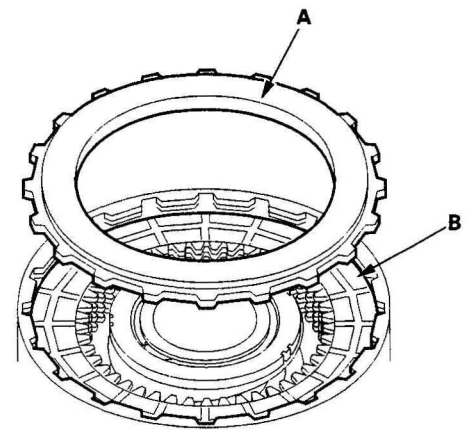
13. Install the disc spring in the 1st, 3rd, and 4th clutches in the direction shown.

    NOTE: The 2nd clutch does not have a disc spring.

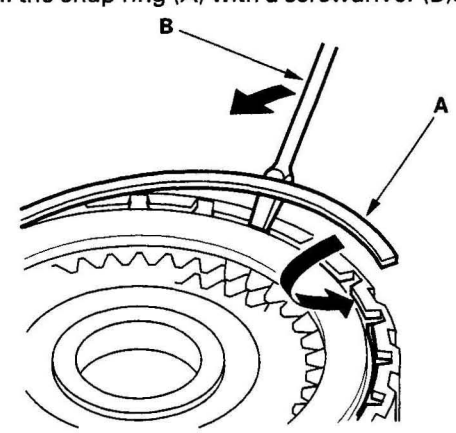


14. Make sure the inside of the clutch drum is free of dirt and other foreign matter.

15. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate (A) with the flat side toward the disc (B).



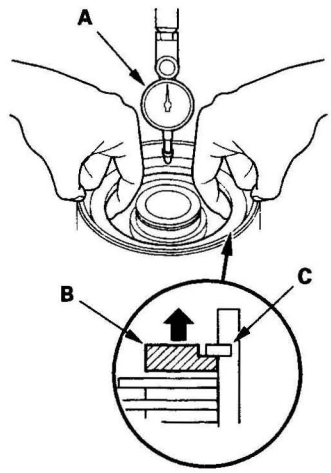
16. Install the snap ring (A) with a screwdriver (B).



BACK

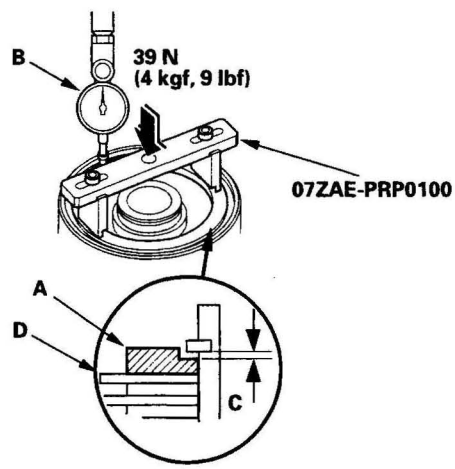
Protected by AR

17. Set a dial indicator (A) on the clutch end plate (B).



18. Zero the indicator with the clutch end plate lifted up to the snap ring (C).

19. Release the clutch end plate to lower it, then put the special tool on the end plate (A).



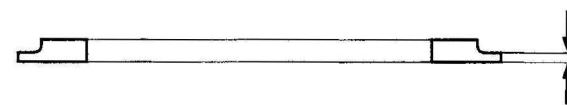
20. Press the special tool down with 39 N (4 kgf, 9 lbf) using a force gauge, and read the dial indicator (B). The dial indicator reads the clearance (C) between the clutch end plate and top disk (D).
Take measurements in at least three places, and use the average as the actual clearance.

Clutch End Plate-to-Top Disc Clearance:

Clutch	Service Limit
1st	1.2–1.4 mm (0.047–0.055 in.)
2nd	0.85–1.05 mm (0.033–0.041 in.)
3rd	0.55–0.75 mm (0.022–0.030 in.)
4th	0.55–0.75 mm (0.022–0.030 in.)

21. If the clearance is not within the service limit, select a new clutch end plate from the following table.

NOTE: If the thickest clutch end plate is installed, but the clearance is still over the standard, replace the clutch discs and clutch plates as a set.



1ST and 2ND CLUTCH END PLATES

Mark	Part Number	Thickness
6	22551-P7T-003	2.6 mm (0.102 in.)
7	22552-P7T-003	2.7 mm (0.106 in.)
8	22553-P7T-003	2.8 mm (0.110 in.)
9	22554-P7T-003	2.9 mm (0.114 in.)
0	22555-P7T-003	3.0 mm (0.118 in.)
1	22556-P7T-003	3.1 mm (0.122 in.)
2	22557-P7T-003	3.2 mm (0.126 in.)
3	22558-P7T-003	3.3 mm (0.130 in.)
4	22559-P7T-003	3.4 mm (0.134 in.)

3RD and 4TH CLUTCH END PLATES

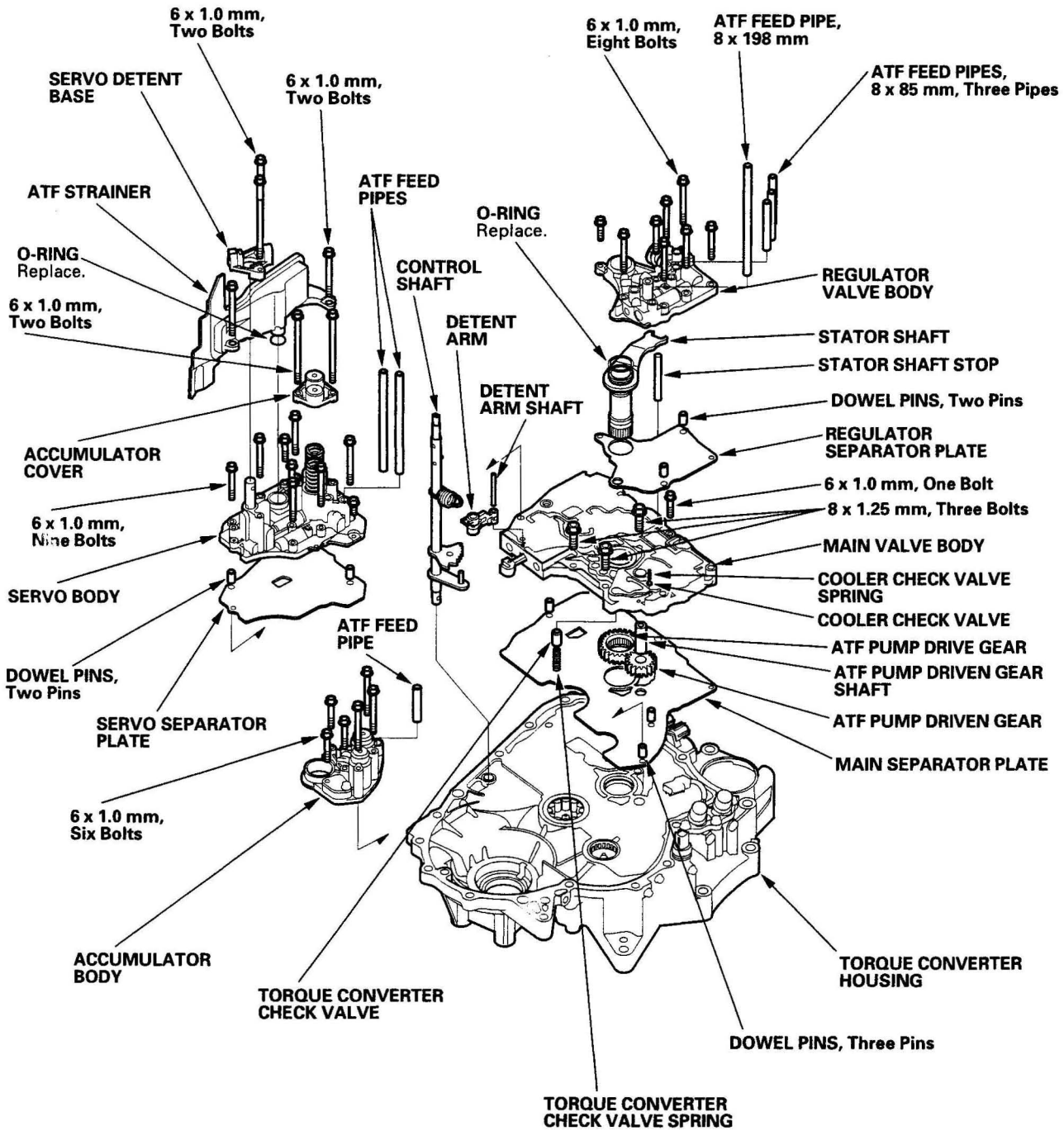
Mark	Part Number	Thickness
1	22561-P7T-003	2.1 mm (0.083 in.)
2	22562-P7T-003	2.2 mm (0.087 in.)
3	22563-P7T-003	2.3 mm (0.091 in.)
4	22564-P7T-003	2.4 mm (0.094 in.)
5	22565-P7T-003	2.5 mm (0.098 in.)
6	22566-P7T-003	2.6 mm (0.102 in.)
7	22567-P7T-003	2.7 mm (0.106 in.)
8	22568-P7T-003	2.8 mm (0.110 in.)
9	22569-P7T-003	2.9 mm (0.114 in.)

Protected by AR

Valve Bodies and ATF Strainer Installation

Exploded View

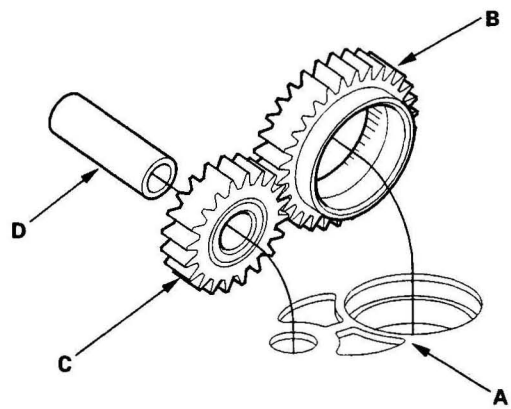
Torque:
—6 x 1.0 mm: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)
—8 x 1.25 mm: 18 N·m (1.8 kgf·m, 13 lbf·ft)



BACK

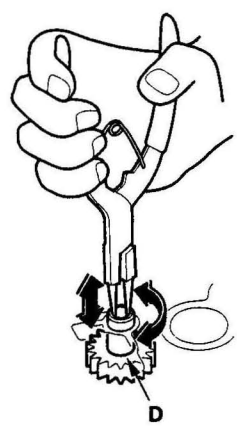
Protected by AR

1. Install the main separator plate (A) and three dowel pins on the torque converter housing. Then install the ATF pump drive gear (B), driven gear (C) and ATF pump driven gear shaft (D). Install the ATF pump driven gear with its grooved and chamfered side facing down.



2. Install the torque converter check valve and spring, then install the main valve body (one 6 mm bolt and three 8 mm bolts). Make sure the ATF pump drive gear (B) rotates smoothly in the normal operating direction, and the ATF pump driven gear shaft (D) moves smoothly in the axial and normal operating direction.





3. If the ATF pump drive gear and ATF pump driven gear shaft do not move smoothly, loosen the main valve body bolts. Realign the ATF pump driven gear shaft, and retighten the bolts to the specified torque, then recheck. Failure to align the ATF pump driven gear shaft correctly will result in a seized ATF pump drive gear or ATF pump driven gear shaft.

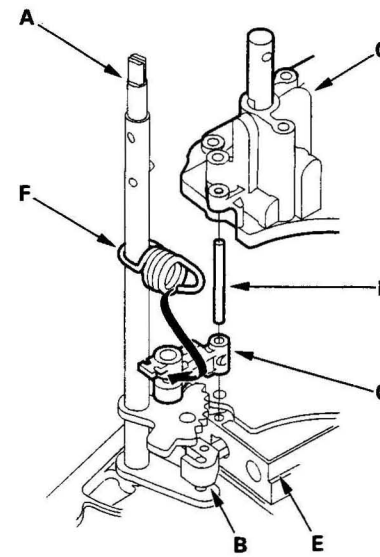
4. Install the cooler check valve and spring on the main valve body, then install the two dowel pins and the regulator separator plate.

5. Install the stator shaft and stator shaft stop.

6. Install the regulator valve body (eight bolts).

7. Install the two dowel pins and the servo separator plate on the main valve body.

8. Install the control shaft (A) in the torque converter housing along with the manual valve (B).



9. Install the detent arm (C) and arm shaft (D) in the main valve body (E), then hook the detent arm spring (F) to the detent arm.

10. Install the servo body (G) (nine bolts).

11. Install the accumulator cover (two bolts).

12. Install the ATF strainer (two bolts).

13. Install the servo detent base (two bolts).

14. Install the accumulator body (six bolts).

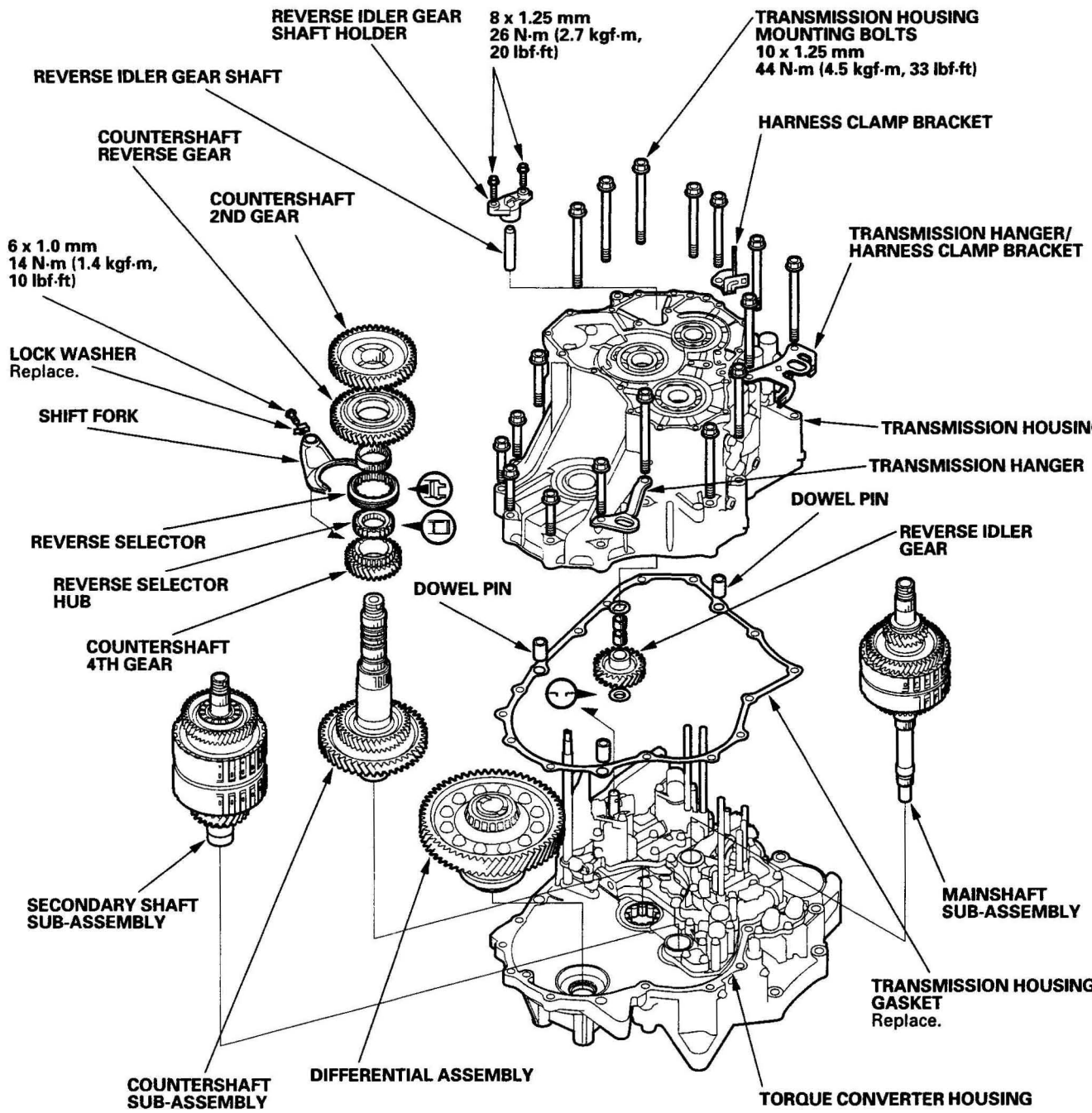
15. Install the two ATF feed pipes in the servo body, four pipes in the regulator valve body, and the ATF feed pipe in the accumulator body.

BACK

Protected by AR

Shaft Assemblies and Housing Installation

Exploded View



BACK

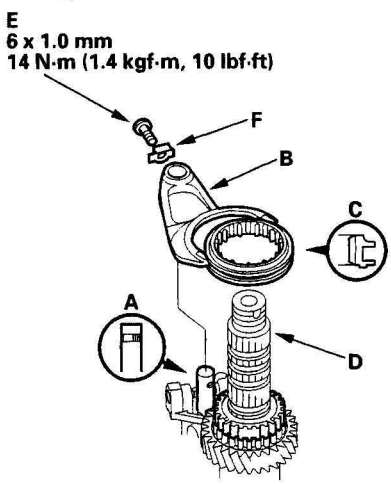
Protected by AR

NOTE: Refer to the Exploded View as needed during the following procedure.

1. Install the differential assembly, countershaft sub-assembly, mainshaft sub-assembly, and secondary shaft sub-assembly in the torque converter housing.

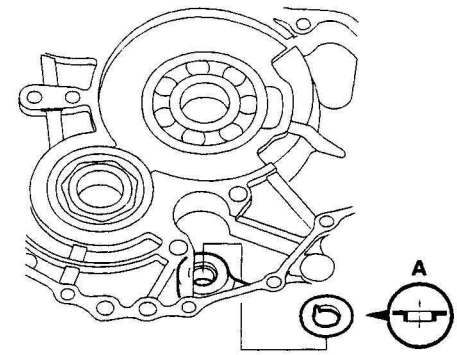
2. Install the countershaft 4th gear and reverse selector hub on the countershaft. If the reverse selector hub is a press-fitted type, refer to the reverse selector hub installation procedures (see page 14-183).

3. Turn the shift fork shaft (A) so the large chamfered hole is facing the fork bolt hole. Then install the shift fork (B) and reverse selector (C) together on the shift fork shaft and countershaft (D). Secure the shift fork to the shift fork shaft with the lock bolt (E) and a new lock washer (F), then bend the lock washer against the bolt head.

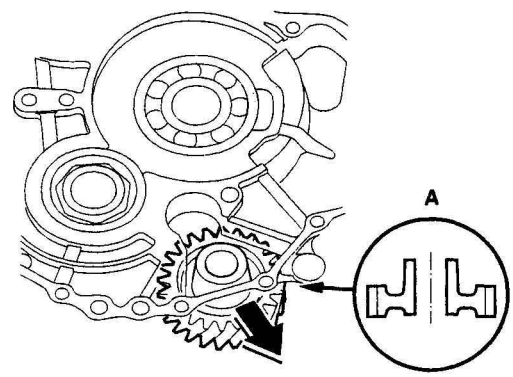


4. Install the needle bearing, countershaft reverse gear, and countershaft 2nd gear on the countershaft.

5. Place the thrust washer (A) in the transmission housing.



6. Place the reverse idler gear (A) in the transmission housing as shown, then slide it in the direction shown.

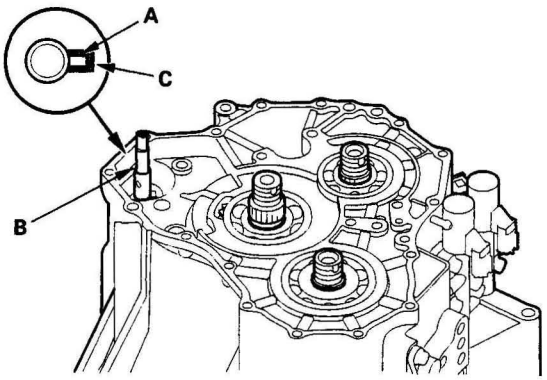


(cont'd)

Protected by AR

Shaft Assemblies and Housing Installation (cont'd)

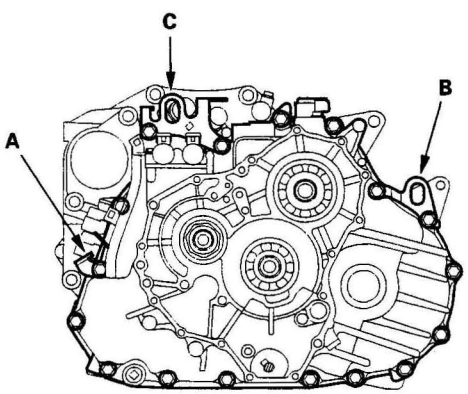
7. Align the spring pin (A) on the control shaft (B) with the transmission housing groove (C) by turning the control shaft.



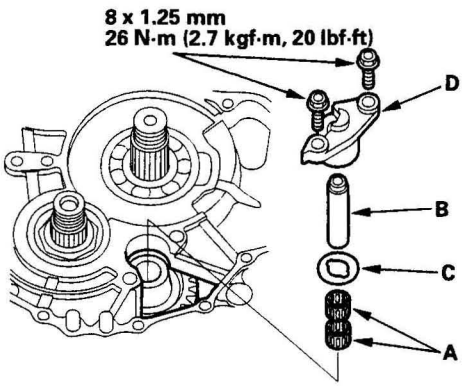
8. Install three dowel pins and a new gasket on the torque converter housing.

9. Place the transmission housing on the torque converter housing, then install the transmission housing mounting bolts along with the harness clamp bracket (A), transmission hanger (B), and transmission hanger/harness clamp bracket (C). Tighten the bolts in a crisscross pattern in two or more steps.

TORQUE: 44N·m (4.5 kgf·m, 33 lbf·ft)



10. Engage the reverse idler gear with the countershaft reverse gear and the mainshaft reverse gear. Then install the needle bearings (A), reverse idler gear shaft (B), and thrust washer (C) in the reverse idler gear, and install the reverse idler gear shaft holder (D) on the transmission housing.



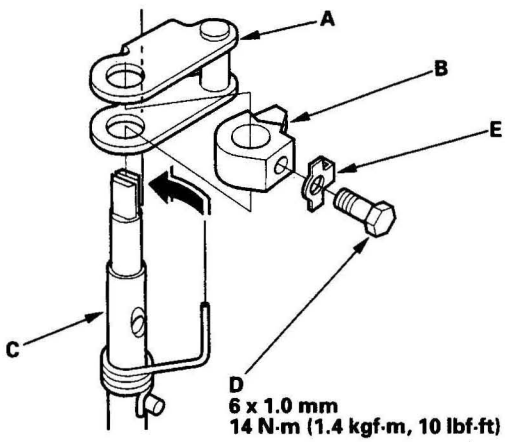
BACK

Protected by AR

End Cover and Idler Gears Installation

Special Tools Required
Mainshaft holder
07GAB-PF50101 or 07GAB-PF50100

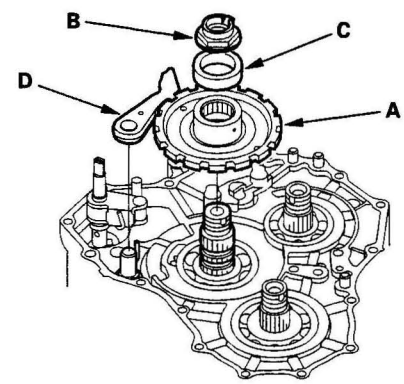
1. Install the park lever (A) and park lever stop (B) on the control shaft (C), then install the lock bolt (D) with a new lock washer (E). Do not bend the lock tab of the lock washer until step 25.



2. Lubricate the following parts with ATF:
   - Splines of the countershaft, the park gear, and the old locknut.
   - Threads of the countershaft and the old locknut.
   - Old conical spring washer.

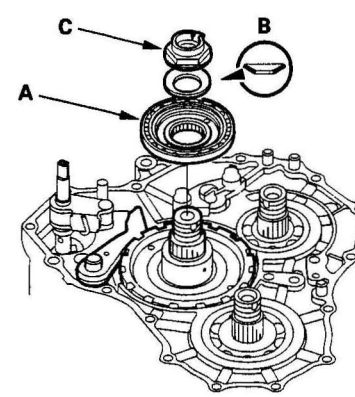
3. Install the park gear (A) using the old locknut (B) and a collar (C). Hold the park pawl (D) against the park gear, then tighten the old locknut until the shaft splines come out slightly over the park gear splines.

   NOTE:
   - Do not use an impact wrench.
   - Countershaft locknut has left-hand threads.



4. Remove the locknut and the collar, then install only the bearing hub/bearing assembly (A) and old conical spring washer (B). Tighten the old locknut (C) to 226 N·m (23.0 kgf·m, 166 lbf·ft), then remove the locknut and conical spring washer.

   NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.

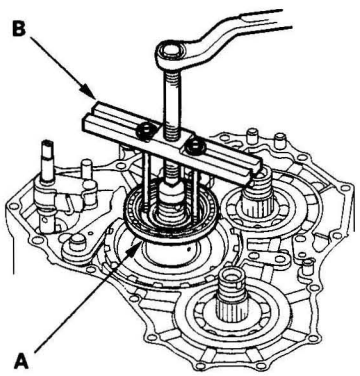


(cont'd)

Protected by AR

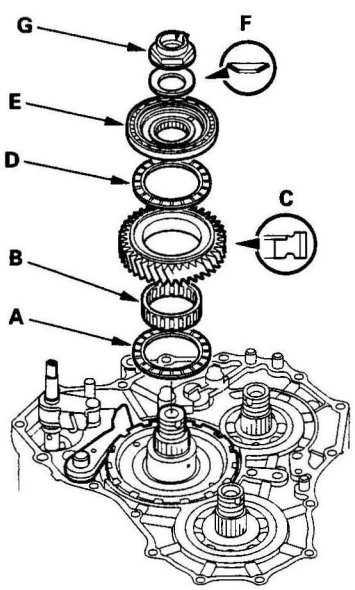
End Cover and Idler Gears Installation (cont'd)

5. Remove the bearing hub/bearing assembly (A) with a puller (B).

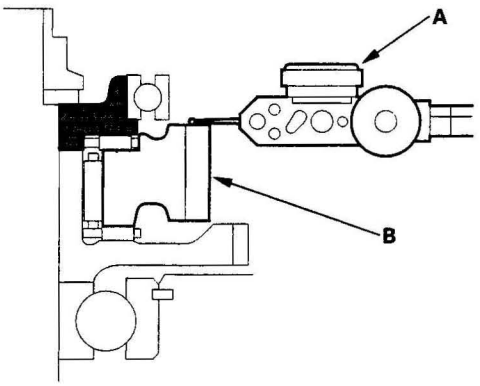


6. Install the thrust needle bearing (A), needle bearing (B), countershaft idler gear (C), thrust needle bearing (D), bearing hub/bearing assembly (E), and the old conical spring washer (F). Then tighten the old locknut (G) to 164 N·m (17.0 kgf·m, 123 lbf·ft).

   NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.

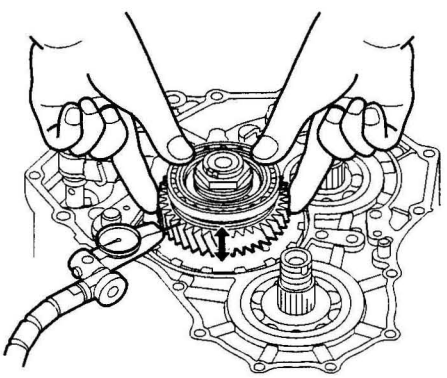


7. Set the dial indicator (A) to the countershaft idler gear (B) as shown.



8. Measure the countershaft idler gear axial clearance in at least three places, while moving the countershaft idler gear.
   Use the average as the actual clearance.

   STANDARD: 0.015–0.045 mm (0.0006–0.0018 in.)

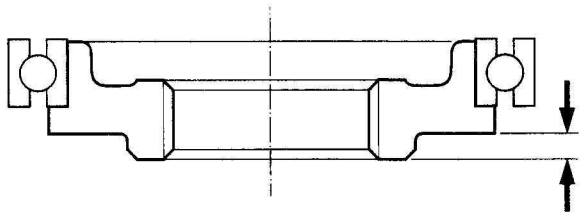


BACK

Protected by AR

9. If the clearance is out of standard, remove the bearing hub/bearing assembly using a puller as described on the previous page.

10. Select and install the new bearing hub/bearing assembly, then recheck.



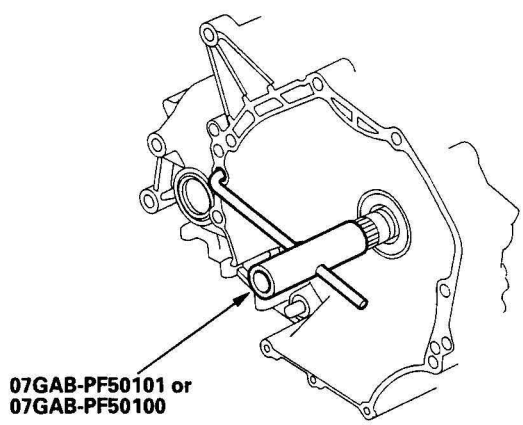
BEARING HUB

Mark	Part Number	Difference
A	90520-P6H-000	3.503 mm (0.1379 in.)
B	90521-P6H-000	3.490 mm (0.1374 in.)
C	90522-P6H-000	3.477 mm (0.1369 in.)
D	90523-P6H-000	3.464 mm (0.1364 in.)

11. After replacing the bearing hub/bearing assembly, make sure the clearance is within standard.

12. Remove the old locknut and old conical spring washer from the countershaft.

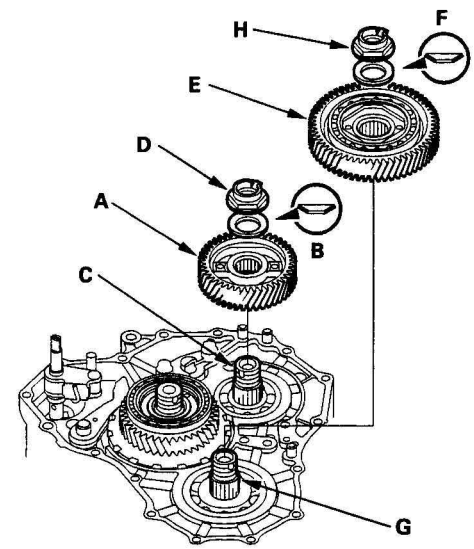
13. Install the special tool onto the mainshaft.



14. Lubricate the following parts with ATF:
    - Splines of the mainshaft, secondary shaft, and idler gears.
    - Threads of the mainshaft and secondary shaft.
    - Threads of the old mainshaft and secondary shaft locknuts.
    - Old conical spring washers.

15. Install the mainshaft idler gear (A) and the old conical spring washer (B) on the mainshaft (C). Tighten the old locknut (D) to 226 N·m (23.0 kgf·m, 166 lbf·ft)

    NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.



16. Install the secondary shaft idler gear (E) and the old conical spring washer (F) on the secondary shaft (G). Tighten the old locknut (H) to seat the secondary shaft idler gear to 226 N·m (23.0 kgf·m, 166 lbf·ft)

    NOTE:
    - Use a torque wrench to tighten the locknut. Do not use an impact wrench.
    - Secondary shafts locknut has left-hand threads.

17. Remove the old locknuts and old conical spring washers from the mainshaft and the secondary shaft.

(cont'd)

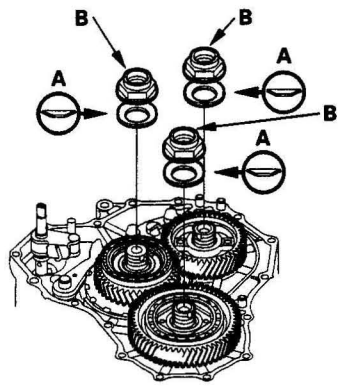
BACK

Protected by AR

End Cover and Idler Gears Installation (cont'd)

18. Lubricate the threads of each shaft, the new locknuts, and the new concial spring washers with ATF.

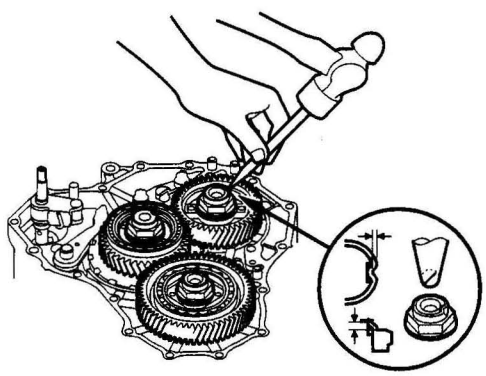
19. Install the new conical spring washers (A) in the direction shown, and install the new locknuts (B).



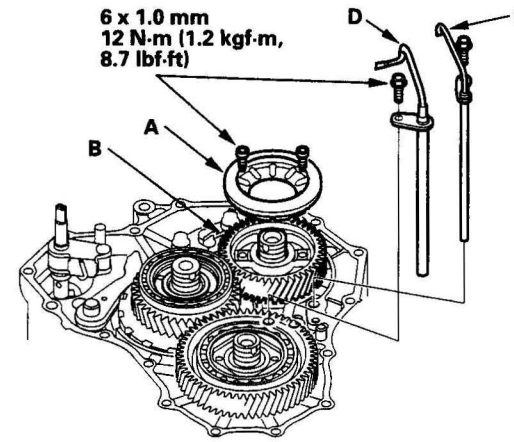
20. Tighten the locknut to 167 N·m, (17.0 kgf·m, 123 lbf·ft).

    NOTE:
    - Use a torque wrench to tighten the locknut. Do not use an impact wrench.
    - Countershaft and secondary shaft locknuts have left-hand threads.

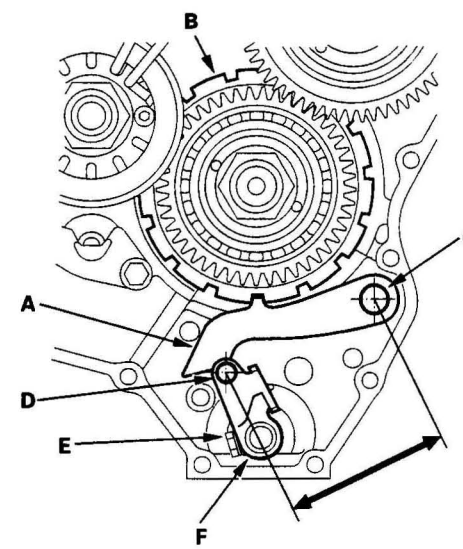
21. Stake each locknut into its shaft using a 3.5 mm punch.



22. Install the pitot flange (A) on the mainshaft idler gear (B), then install the lubrication pitot pipe (C) and the pitot pipe (D) on the transmission housing.



23. Set the park lever in the [P] position, then verify that the park pawl (A) engages the park gear (B).



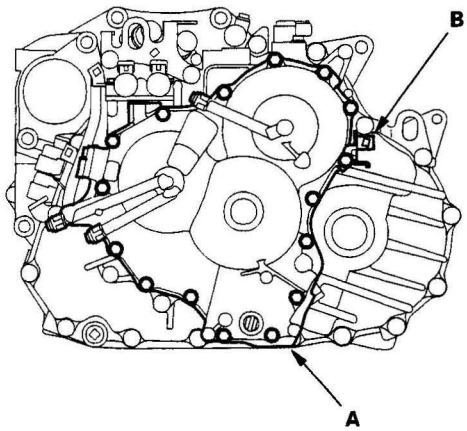
24. If the park pawl does not engage fully, check the distance between the pawl shaft (C) and the park lever roller pin (D) (see page 14-163).

25. Tighten the lock bolt (E), and bend the lock tab of the lock washer (F) against the lock bolt head.

BACK

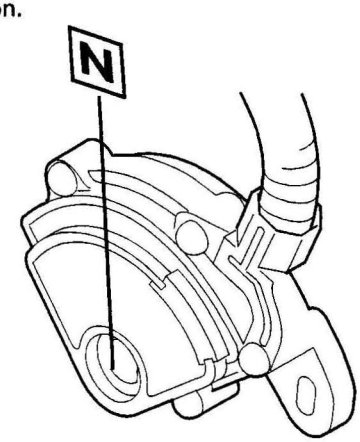
Protected by AR

26. Install the end cover (A) with the two dowel pins, new O-rings, new gasket, and harness clamp bracket (B). Tighten the 16 bolts to 12 N·m, (1.2 kgf·m, 8.7 lbf·ft).



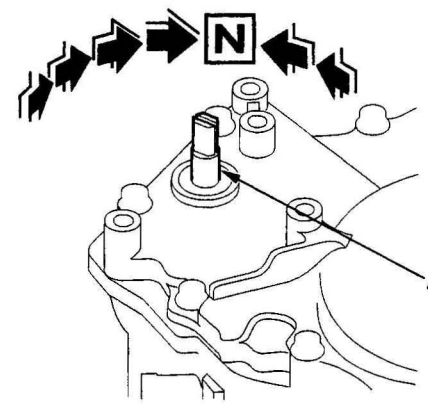
27. Set the A/T gear position switch to the N position.

NOTE: The A/T gear position switch clicks in the N position.



28. Set the control shaft (A) to the N position by turning it.

NOTE: Be careful not to squeeze the end of the control shaft tips together. If the tips are squeezed together it will cause a faulty signal or position due to the play between the control shaft and position switch.

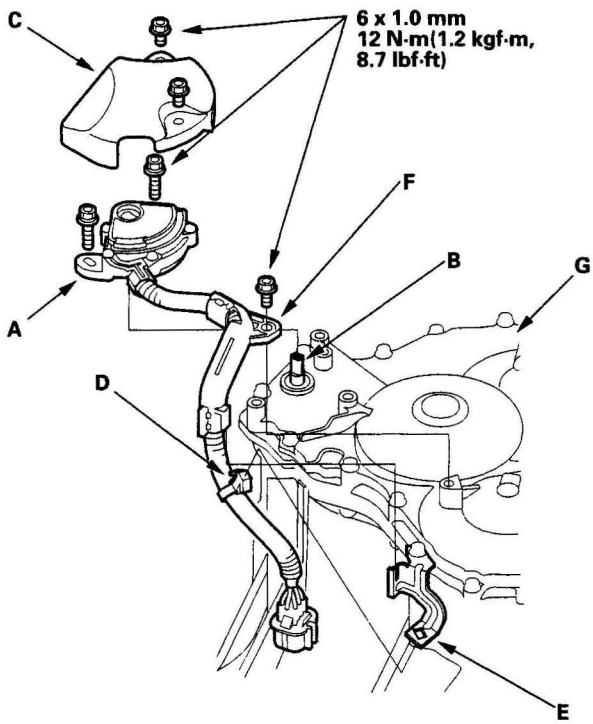


(cont'd)

Protected by AR

End Cover and Idler Gears Installation (cont'd)

29. Install the A/T gear position switch (A) gently on the control shaft (B), then secure it with the bolts. Take care not to move the A/T gear position switch when tightening the bolts.



30. Install the A/T gear position switch cover (C); install the harness clamp (D) on the clamp bracket (E); install the harness clamp (F) on the end cover (G).

31. Install the ATF cooler lines and new sealing washers. Tighten the line fittings to 28 N·m (2.9 kgf·m, 21 lbf·ft)

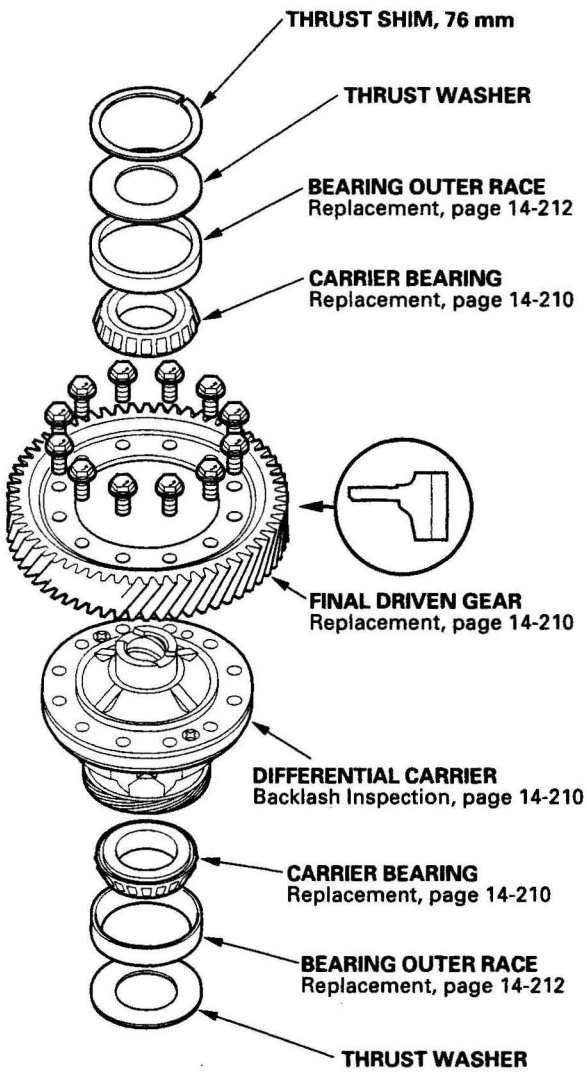
32. Install the breather tube.

33. Install the ATF dipstick.

BACK

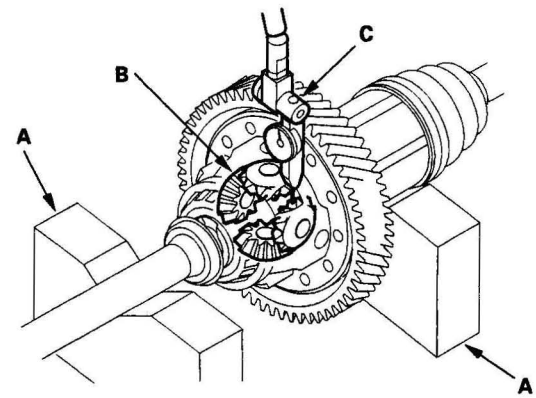
Protected by AR

Component Location Index



Backlash Inspection

1. Place the differential assembly on V-blocks (A), and install both axles.



2. Check the backlash of the pinion gears (B) with a dial indicator (C).

   STANDARD: 0.175 – 0.275 mm (0.007 – 0.011 in.)

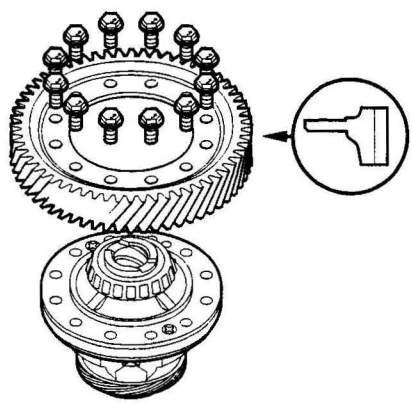
3. If the backlash is out of standard, replace the differential carrier.

Protected by AR

Final Driven Gear/Carrier Replacement

1. Remove the final driven gear from the differential carrier.

   NOTE: The final driven gear bolts have left-hand threads.



2. Install the final driven gear with the chamfered side on the inner bore facing the differential carrier.
3. Tighten the bolts to the specified torque in a crisscross pattern.

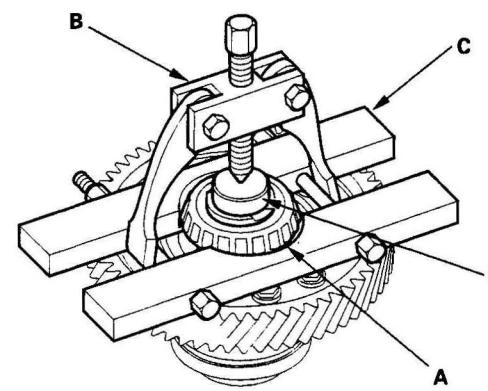
   TORQUE: 101 N·m (10.3 kgf·m, 74.5 lbf·ft)

Carrier Bearing Replacement

Special Tools Required
Attachment, 40 x 50 mm 07LAD-PW50601

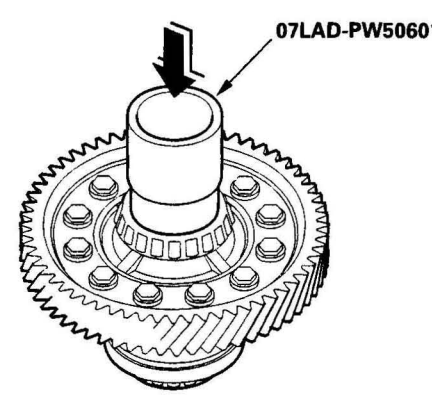
NOTE:
- The bearing and outer race should be replaced as a set.
- Inspect and adjust the bearing preload whenever bearing is replaced.
- Check the bearing for wear and rough rotation. If the bearing is OK, removal is not necessary.

1. Remove the carrier bearing (A) with a commercially available bearing puller (B), bearing separator (C), and stepped adapter (D).



2. Install the new carrier bearings with the special tool and a press.

   NOTE:
   - Press the bearings on until they bottom.
   - Use the small end of the special tool to install the bearing.
   - Press the bearings on securely so there is no clearance between the bearings and the differential carrier.



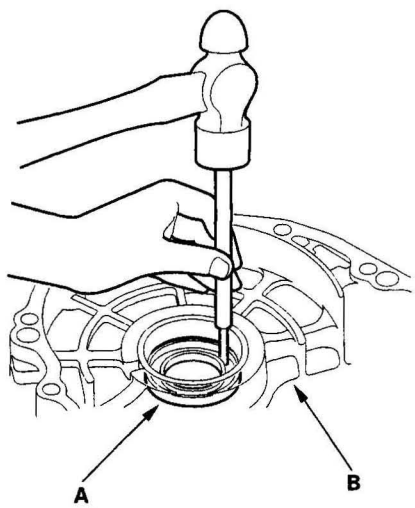
BACK

Protected by AR

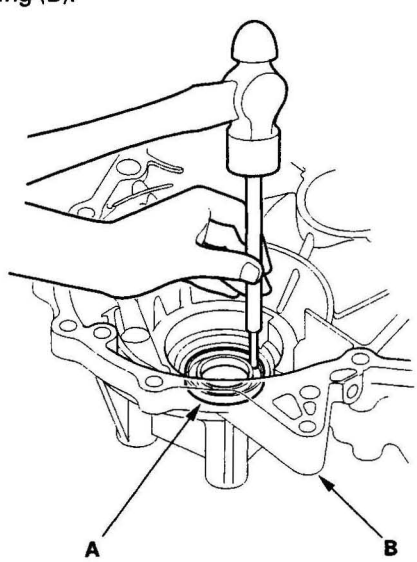
Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Seal driver attachment 07GAD-PG40101 or 07GAD-PG40100
- Oil seal driver attachment 07JAD-PH80101

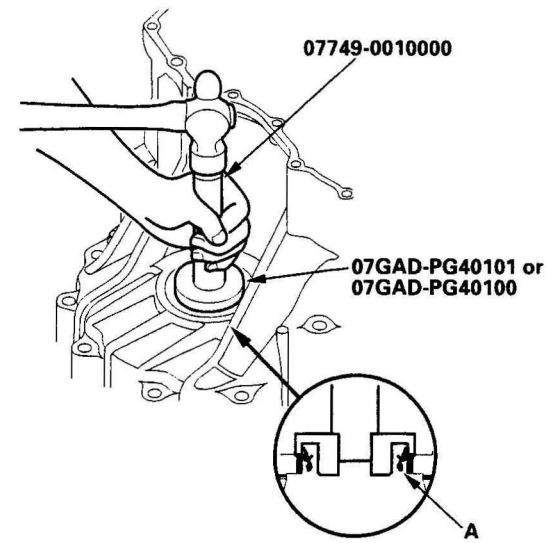
1. Remove the differential assembly.
2. Remove the oil seal (A) from the transmission housing (B).



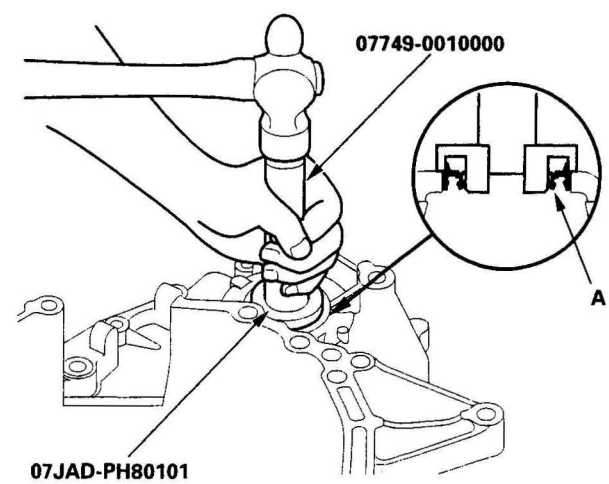
3. Remove the oil seal (A) from the torque converter housing (B).



4. Install the oil seal (A) in the transmission housing with the special tools.



5. Install the oil seal (A) in the torque converter housing with the special tools.



Protected by AR

Carrier Bearing Outer Race Replacement

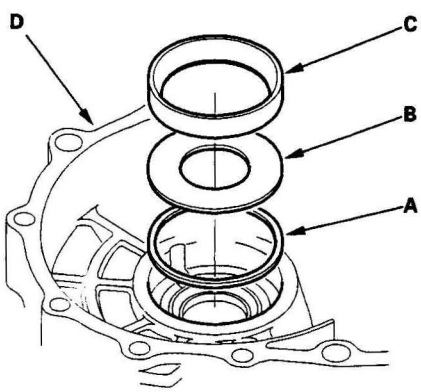
Special Tools Required
- Driver 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100

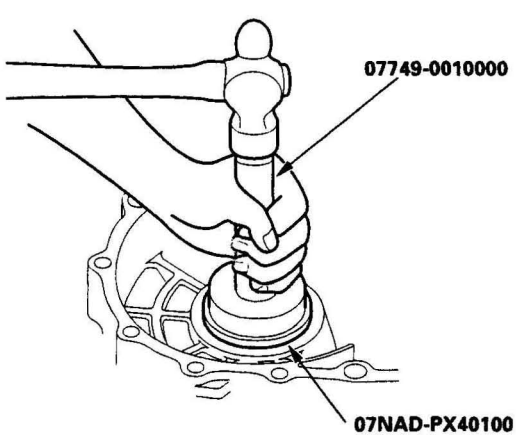
NOTE:
- Replace the bearing with a new one whenever the outer race is replaced.
- Do not use shim(s) on the torque converter housing side.
- Adjust preload after replacing the bearing and outer race.
- Coat all parts with ATF during installation.

1. Remove the bearing outer race from the transmission housing by heating the housing to about 212°F (100°C) with a heat gun. Do not heat the housing to more than 212°F (100°C).

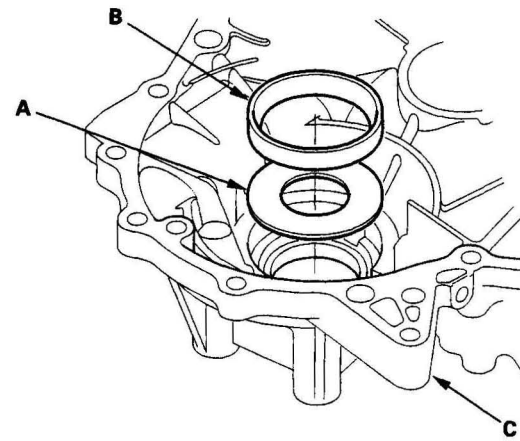
2. Remove the bearing outer race from the torque converter housing.

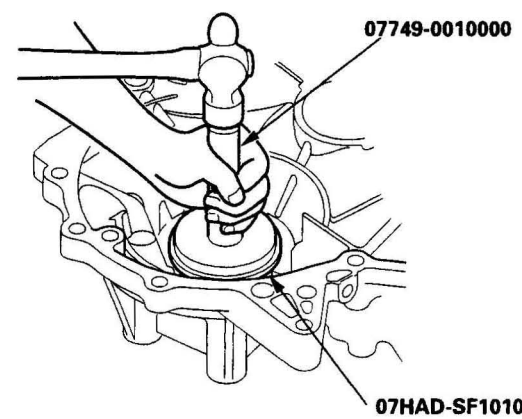
3. Install the thrust shim (A), thrust washer (B), and outer race (C) in the transmission housing (D) with the special tools.





4. Install the thrust washer (A) and outer race (B) in the torque converter housing (C), and use the special tools to make sure the outer race bottoms out in the housing.





BACK

Protected by AR

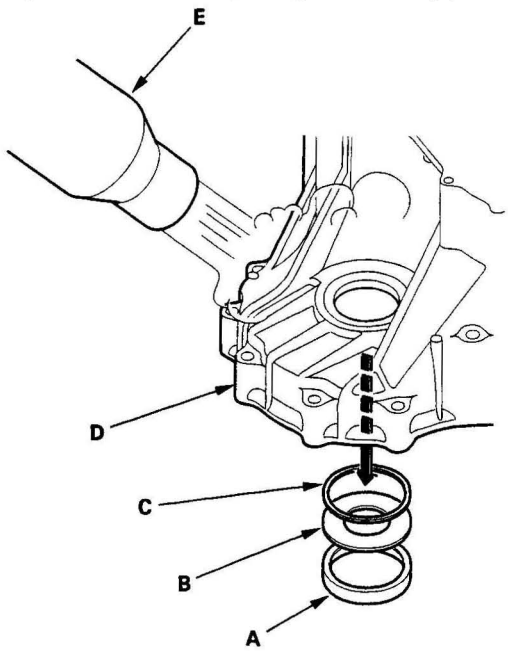
Carrier Bearing Preload Adjustment

Special Tools Required
- Driver 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100
- Preload inspection tool 07XAJ-S0K0100

NOTE: If the transmission housing, torque converter housing, differential carrier, tapered roller bearing, outer race, or thrust shim were replaced, the bearing preload must be adjusted.

1. Remove the bearing outer race (A), thrust washer (B), and thrust shim (C) from the transmission housing (D) by heating the housing to about 212°F (100°C) with a heat gun (E). Do not heat the housing to more than 212°F (100°C).

   NOTE: Let the transmission housing cool to room temperature before adjusting the bearing preload.



2. Replace the tapered roller bearing when the outer race is to be replaced.

3. Do not use a shim on the torque converter housing side.

4. Select the 2.60 mm (0.102 in.) thrust shim from the middle of the table below.

THRUST SHIM, 76 mm

NO.	Part Number	Thickness
S	41438-PX4-700	2.05 mm (0.081 in.)
T	41439-PX4-700	2.01 mm (0.083 in.)
U	41440-PX4-700	2.15 mm (0.085 in.)
A	41441-PK4-000	2.20 mm (0.087 in.)
B	41442-PK4-000	2.25 mm (0.089 in.)
C	41443-PK4-000	2.30 mm (0.091 in.)
D	41444-PK4-000	2.35 mm (0.093 in.)
E	41445-PK4-000	2.40 mm (0.094 in.)
F	41446-PK4-000	2.45 mm (0.096 in.)
G	41447-PK4-000	2.50 mm (0.098 in.)
H	41448-PK4-000	2.55 mm (0.100 in.)
I	41449-PK4-000	2.60 mm (0.102 in.)
J	41450-PK4-000	2.65 mm (0.104 in.)
K	41451-PK4-000	2.70 mm (0.106 in.)
L	41452-PK4-000	2.75 mm (0.108 in.)
M	41453-PK4-000	2.80 mm (0.110 in.)
N	41454-PK4-000	2.85 mm (0.112 in.)
O	41455-PK4-000	2.90 mm (0.114 in.)
P	41456-PK4-000	2.95 mm (0.116 in.)
Q	41457-PK4-000	3.00 mm (0.118 in.)
R	41458-PK4-000	3.05 mm (0.120 in.)

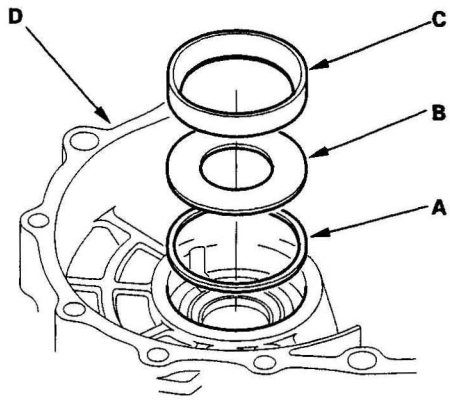
(cont'd)

BACK

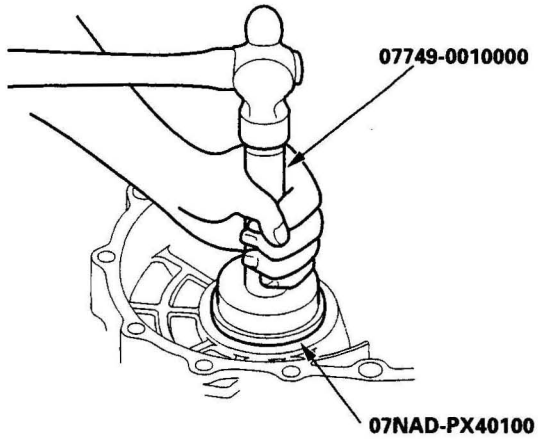
Protected by AR

Carrier Bearing Preload Adjustment (cont'd)

5. Install the thrust shim (A), thrust washer (B), and bearing outer race (C) in the transmission housing (D).

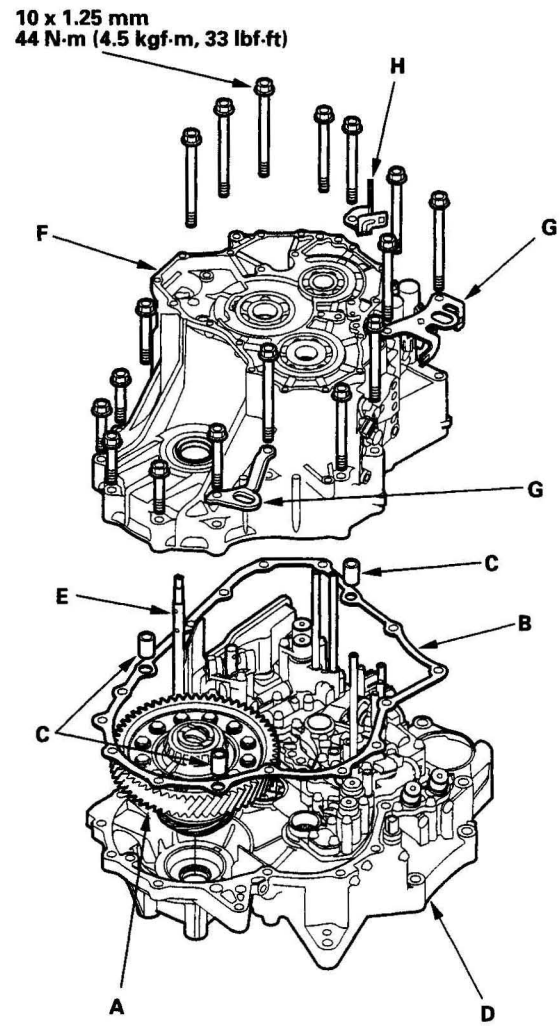


6. Drive in the outer race with the special tools.



7. Check that there is no clearance between the thrust washer, outer race, shim, and transmission housing.

8. Install the differential assembly (A), gasket (B), and dowel pins (C) on the torque converter housing (D). Align the spring pin on the control shaft (E) with the transmission housing groove.



9. Install the transmission housing (F) with the transmission hangers (G) and harness clamp bracket (H), then tighten the bolts.

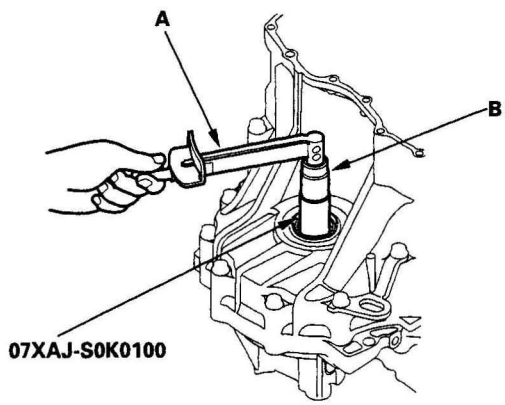
BACK

Protected by AR

10. Rotate the differential assembly in both directions to seat the bearings.

11. Measure the starting torque of the differential assembly with the special tool, a torque wrench (A), and a socket (B). Measure the starting torque at normal room temperature in both directions.

STANDARD:
New bearing: **2.7 – 3.9 N·m (28 – 40 kgf·cm, 24 – 35 lbf·in)**
Reused bearings: **2.5 – 3.6 N·m (25 – 37 kgf·cm, 22 – 32 lbf·in)**



12. To increase the starting torque, increase the thickness of the shim. To decrease the starting torque, decrease the thickness of the shim. Changing the shim to the next size will increase or decrease starting torque about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 3 – 3 lbf·in).

Protected by AR

5-speed Automatic Transmission (2000-2003 Models)

Automatic Transmission
Special Tools 14-218
General Troubleshooting Information 14-219
DTC Troubleshooting Index 14-223
Symptom Troubleshooting Index 14-225
System Description 14-235
DTC Troubleshooting 14-292
Road Test 14-334
Stall Speed Test 14-337
Pressure Tests 14-338
Torque Converter Clutch Solenoid Valve Test 14-340
Torque Converter Clutch Solenoid Valve Replacement 14-340
Shift Solenoid Valve B Test 14-341
Shift Solenoid Valve B Replacement 14-341
Shift Solenoid Valves A and C Test 14-342
Shift Solenoid Valves A and C Replacement 14-342
A/T Clutch Pressure Control Solenoid Valves A and B Test 14-343
A/T Clutch Pressure Control Solenoid Valves A and B Replacement 14-344
A/T Clutch Pressure Control Solenoid Valve C Test 14-345
A/T Clutch Pressure Control Solenoid Valve C Replacement 14-346
Speed Sensor Replacement 14-346
3rd Clutch Pressure Switch Replacement 14-347
4th Clutch Pressure Switch Replacement 14-347
ATF Temperature Sensor Replacement 14-348
ATF Level Check 14-349
ATF Replacement 14-350
Transmission Removal 14-351
Transmission Installation 14-359
Shift Lever Removal 14-366
Shift Lever Installation 14-367
Shift Lever Disassembly/Reassembly 14-369
Shift Cable Replacement 14-370
Shift Cable Adjustment 14-373

A/T Gear Position Indicator
Component Location Index 14-375
Circuit Diagram 14-376
D5 Indicator Circuit Troubleshooting 14-377
Sequential Sportshift Transmission Gear Selection Switch Circuit Troubleshooting 14-380
Sportshift Indicator Circuit Troubleshooting 14-382
Transmission Range Switch Test 14-383
Transmission Range Switch Replacement 14-384
Indicator Input Test 14-386
Indicator Bulb Replacement 14-388

A/T Interlock System
Component Location Index 14-389
Circuit Diagram 14-390
Shift Lock System Circuit Troubleshooting 14-391
Key Interlock System Circuit Troubleshooting 14-393
Reverse Lock System Circuit Troubleshooting 14-395
Key Interlock Solenoid/Switch Test 14-397
Shift Lock Solenoid Test 14-397
Shift Lock Solenoid Replacement 14-398
Park Pin Switch Test 14-398

Transmission End Cover
End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Removal 14-399
Park Lever Stop Inspection and Adjustment 14-401
Control Shaft Oil Seal Replacement 14-402
Control Shaft Bearing Replacement 14-402
ATF Feed Pipes Replacement 14-403
End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Installation 14-451

Transmission Housing
Housing and Shaft Assemblies Removal 14-404
Bearing Removal and Installation 14-406
Shaft Assemblies and Housing Installation 14-448

Valve Body
Valve Bodies and ATF Strainer Removal 14-407
Valve Body Repair 14-409
Valve Body Valve Installation 14-410
Main Valve Body Disassembly, Inspection, and Reassembly 14-411
ATF Pump Inspection 14-413
Regulator Valve Body Disassembly, Inspection, and Reassembly 14-414
Servo Body Disassembly, Inspection, and Reassembly 14-415
Top Accumulator Body Disassembly, Inspection, and Reassembly 14-416
Accumulator Body Disassembly, Inspection, and Reassembly 14-417
3rd Accumulator/End Cover Disassembly, Inspection, and Reassembly 14-418
Valve Bodies and ATF Strainer Installation 14-446

Torque Converter Housing
Mainshaft Bearing and Oil Seal Replacement 14-419
Countershaft Bearing Replacement 14-420
Secondary Shaft Bearing Repacement 14-420
Control Shaft Oil Seal Replacement 14-421

Shafts and Clutches
Mainshaft Disassembly, Inspection, and Reassembly 14-422
4th/5th Clutch Clearance Inspection 14-423
Mainshaft Sealing Rings Replacement 14-424
Countershaft Disassembly, Inspection, and Reassembly 14-425
Countershaft Reverse Selector Hub and 4th Gear Removal 14-427
Countershaft Reverse Selector Hub and 4th Gear Installation 14-428
3rd Clutch Ball Bearing Replacement 14-429
Secondary Shaft Disassembly, Inspection, and Reassembly 14-430
Secondary Shaft Clearance Inspection 14-431
Secondary Shaft Idler Gear Bearing Replacement 14-433
1st Gear One-way Clutch Inspection 14-434
1st Clutch Hub Replacement 14-434
Clutch Disassembly 14-435
Clutch Inspection 14-437
Clutch Reassembly 14-441

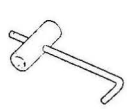
A/T Differential
Component Location Index 14-458
Backlash Inspection 14-459
Final Driven Gear/Carrier Replacement 14-459
Carrier Bearing Replacement 14-460
Oil Seal Replacement 14-461
Carrier Bearing Outer Race Replacement 14-462
Carrier Bearing Preload Inspection 14-463

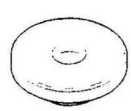
Protected by AR

Special Tools

Ref.No.	Tool Number	Description	Qty
①	07GAB-PF50101 or 07GAB-PF50100	Mainshaft Holder	1
②	07GAD-PG40101 or 07GAD-PG40100	Seal Driver Attachment	1
③	07GAD-SD40101	Attachment, 78 x 90 mm	1
④	07GAE-PG40200 or 07GAE-PG4020A	Clutch Spring Compressor Bolt Assembly	1
*⑤	07HAC-PK40102	Housing Puller	1
⑥	07JAD-PH80101	Oil Seal Driver Attachment	1
⑦	07LAD-PW50601	Attachment, 40 x 50 mm	1
**⑧	07LAE-PX40100	Clutch Spring Compressor Attachment	2
⑨	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	4
⑩	07MAJ-PY40120	A/T Pressure Hose Adapter	4
⑪	07NAD-PX40100	Attachment, 78 x 80 mm	1
⑫	07SAZ-001000A	Backprobe Set	2
⑬	07XAJ-S0K0100	Preload Inspection Tool	1
⑭	07ZAE-PRP0100	Clutch Compressor Attachment	1
⑮	07406-0020400 or 07406-0020401	A/T Oil Pressure Gauge Set w/Panel	1
***⑯	07736-A01000B or 07736-A01000A	Adjustable Bearing Puller, 25—40 mm	1
⑰	07746-0010500	Attachment, 62 x 68 mm	1
⑱	07746-0010600	Attachment, 72 x 75 mm	1
⑲	07746-0010800	Attachment, 22 x 24 mm	1
⑳	07746-0030100	Driver 40 mm I.D.	1
㉑	07749-0010000	Driver	1
㉒	07947-6340500	Driver Attachment	1

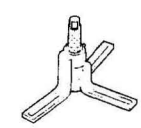
* If the top arm is too short, replace it with 07SAC-P0Z01001.
** 07HAE-PL50101 may be used to substitute one of these tools.
*** Must be used with commercially available 3/8"-16 slide hammer.


①

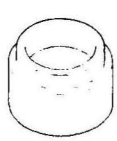

②

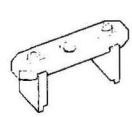

③

④

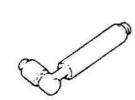

⑤

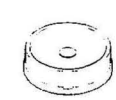

⑥

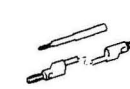

⑦

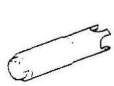

⑧

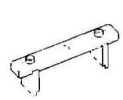

⑨

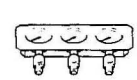

⑩

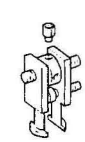

⑪


⑫


⑬


⑭


⑮


⑯


⑰⑱⑲


⑳


㉑


㉒

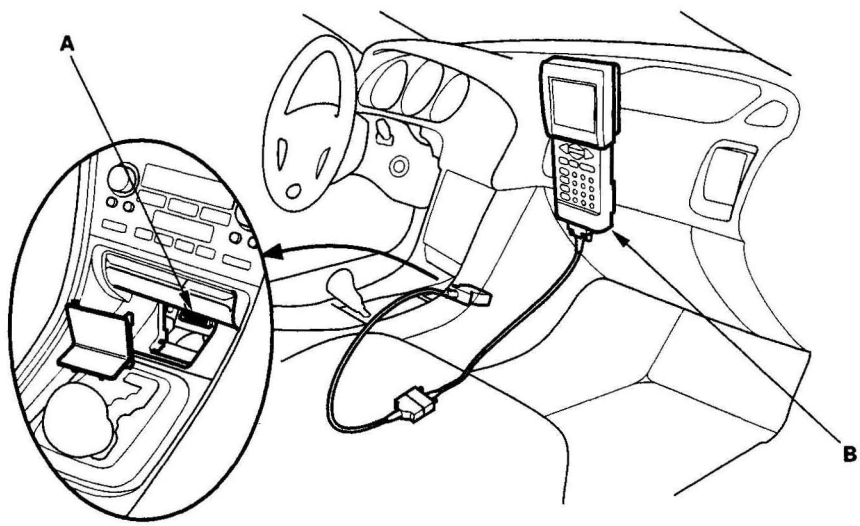
BACK

Protected by AR

General Troubleshooting Information

How to Check for DTCs with the PGM Tester/Scan Tool

When the Powertrain Control Module (PCM) senses an abnormality in the input or output systems, the Ds indicator in the gauge assembly will usually blink and/or the Malfunction Indicator Lamp (MIL) will come on. When the 16P Data Link Connector (DLC) (A) (located behind the front console, between the seat heater switches) is connected to the OBD II Scan Tool or Honda PGM Tester (B) as shown, it will indicate the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).



If the Ds indicator or the MIL has been reported on, or if a driveability problem is suspected, follow this procedure:

1. Connect the OBD II Scan Tool (conforming to SAE J1978) or Honda PGM Tester to the 16P DLC. (See the OBD II Scan Tool or Honda PGM Tester user's manual for specific instructions. If you are using the Honda PGM Tester, make sure it is set to the SAE DTC type.)
2. Turn the Ignition switch ON (II), and observe the DTC on the screen.
3. Record all fuel and emissions DTCs, A/T DTCs, and freeze data.
4. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except for DTC P0700). DTC P0700 means there is one or more A/T DTC, and no problems were detected in the fuel and emissions circuit of the PCM.
5. Get the customer's radio anti-theft code, and write down the radio station presets.
6. Reset the memory with the PGM Tester or by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.
7. Calibrate the engine idle control system in the PCM (see page 11-158), drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for DTCs. If the A/T DTC returns, go to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight, and then go to step 8.
8. Enter the radio code, reset the preset stations, and set the clock.

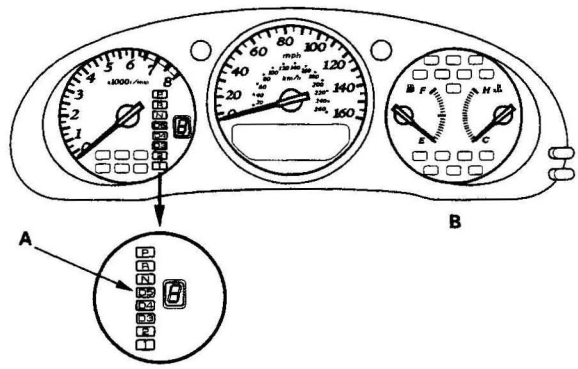
(cont'd)

Protected by AR

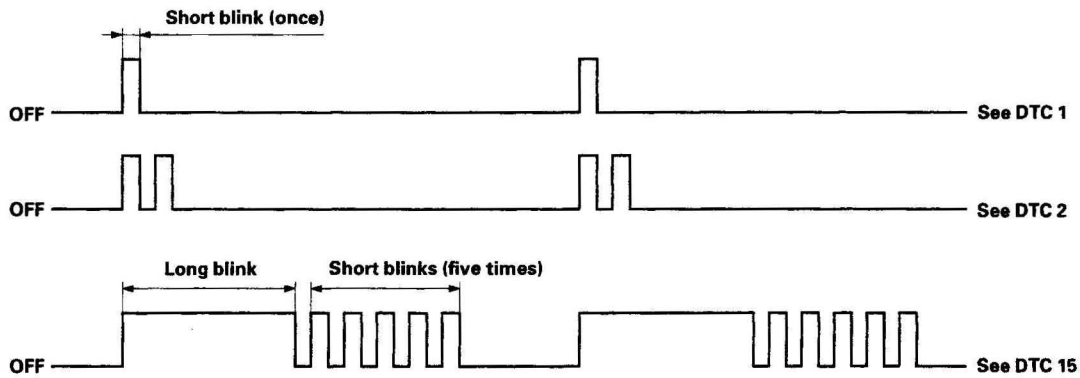
General Troubleshooting Information (cont'd)

How to Check for DTCs

When the PCM senses an abnormality in the input or output systems, the D5 indicator (A) in the gauge assembly (B) will usually blink and/or the MIL may come on. When the 16P Data Link Connector (DLC) (located behind the front console, between the seat heater switches) is connected to the Honda PGM Tester, the D5 indicator will blink the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).
When the D5 indicator has been reported on, connect the PGM Tester to the DLC (16P). Turn the ignition switch ON (II), select Honda Systems, and then the SCS mode, then observe the D5 indicator. If a PGM Tester is not available, jump DLC terminal 1 (BRN) to terminal 12 (BLK), then turn the ignition switch ON (II) and observe the D5 indicator.



Codes 1 through 9 are indicated by individual short blinks. Code 10 and above are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code. After determining the code, refer to the DTC Troubleshooting Index.



If the D5 indicator or the MIL (Malfunction Indicator Lamp) has been reported on, or if a driveability problem is suspected, follow this procedure:

1. Record all fuel and emissions DTCs, A/T DTCs, and freeze data.
2. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except for DTC 70). DTC 70 means there is one or more A/T DTC, and no problems were detected in the fuel and emissions circuit of the PCM.
3. Get the customer's radio anti-theft code, and write down the radio station presets.
4. Reset the memory by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.
5. Calibrate the engine idle control system in the PCM (see page 11-158), drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for DTCs.
   If the DTC returns, refer to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight, then go to step 6.
6. Re-enter the radio code, reset the preset stations, and set the clock.

BACK

Protected by AR

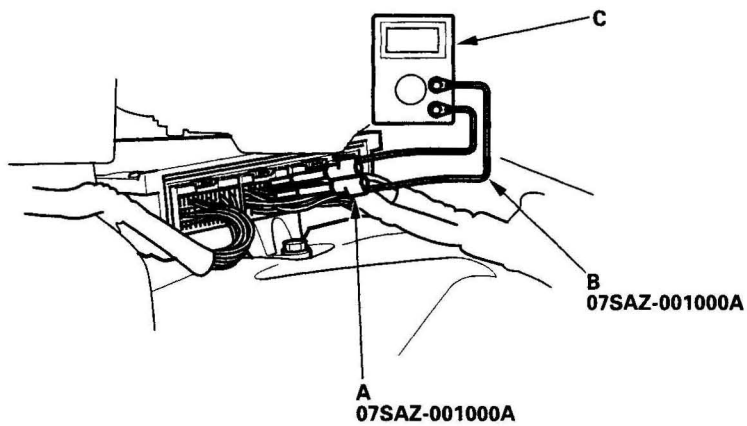
How to Troubleshoot Circuits at the PCM

Special Tools Required
Backprobe set 07SAZ-001000A (Two required)

SRS components are located in this area. Review the SRS components locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-15).

1. Pull back the carpet from passenger's side of the center console to expose the PCM.
2. Inspect the circuit on the PCM, according to the DTC troubleshooting, with the special tools and a digital multimeter.
3. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a multimeter (C). Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it comes in contact with the terminal end of the wire.

   NOTE: Failure to use the appropriate backprobe tools can cause connector and/or terminal damage.



(cont'd)

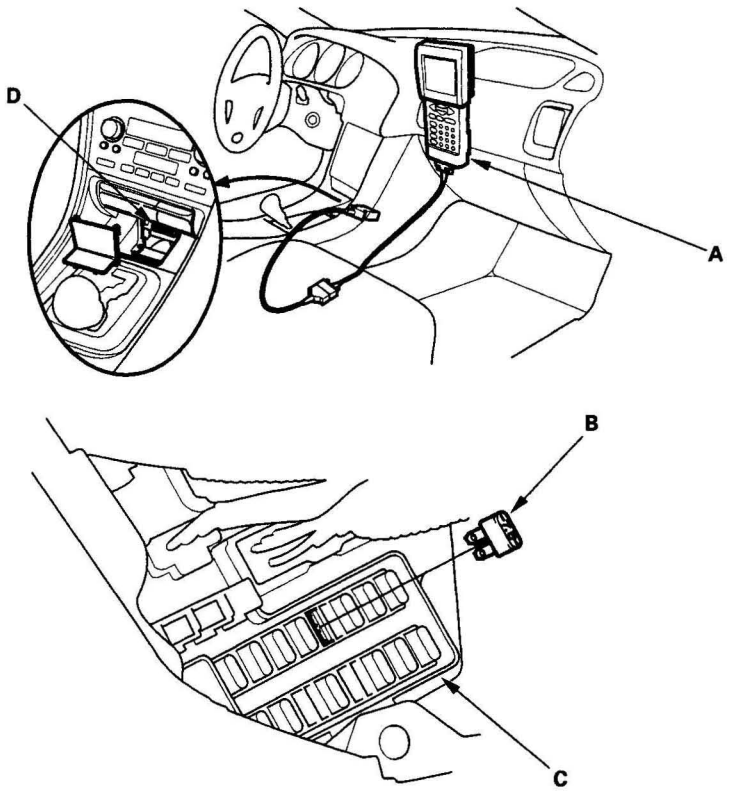
BACK

Protected by AR

General Troubleshooting Information (cont'd)

How to Reset the PCM

1. Make sure you have the anti-theft code for the radio, then write down the radio station presets.
2. Turn the ignition switch OFF.
3. Use one of these methods to reset the PCM memory:
   - Use the OBD II Scan Tool or the Honda PGM Tester (A).
   - Remove the BACK-UP fuse (7.5A) (B) from the passenger's under-dash fuse/relay box (C) for 10 seconds.



How to End a Troubleshooting Session

This procedure must be done after any troubleshooting.

1. Turn the ignition switch OFF.
2. Reset the PCM.
3. Disconnect the OBD II Scan Tool or the Honda PGM Tester from the Data Link Connector (16P) (D).
4. Turn the ignition switch ON (II).
5. Enter the radio code, reset the preset stations, and set the clock.
6. Perform the PCM idle learn precedure (see page 11-158).
7. To verify that the problem is repaired, test-drive the vehicle for several minutes at speeds over 30 mph (48km/h).

BACK

Protected by AR

DTC Troubleshooting Index

NOTE: Record all freeze data and review the general troubleshooting information (see page 14-219) before you begin to troubleshoot a DTC.

For Premium Model

DTC	Ds Indicator	MIL	Detection Item	Page
P0710 (28)	Blinks	ON	ATF temperature sensor	(see page 14-292)
P0715 (15)	Blinks	ON	Mainshaft speed sensor	(see page 14-294)
P0720 (9)	Blinks	ON	Countershaft speed sensor	(see page 14-297)
P0730 (41)	OFF	ON	Shift control system	(see page 14-300)
P0740 (40)	OFF	ON	Lock-up control system	(see page 14-301)
P0743 (1)	Blinks	ON	Torque converter clutch solenoid valve	(see page 14-302)
P0748 (16)	Blinks	ON	A/T clutch pressure control solenoid valve A	(see page 14-304)
P0753 (7)	Blinks	ON	Shift solenoid valve A	(see page 14-306)
P0758 (8)	Blinks	ON	Shift solenoid valve B	(see page 14-308)
P0763 (22)	Blinks	ON	Shift solenoid valve C	(see page 14-310)
P0778 (23)	Blinks	ON	A/T clutch pressure control solenoid valve B	(see page 14-312)
P0780 (45)	Blinks	ON	Mechanical problem in hydraulic system	(see page 14-314)
P0798 (29)	Blinks	ON	A/T clutch pressure control solenoid valve C	(see page 14-315)
P0845 (26)	OFF	OFF	3rd clutch pressure switch	(see page 14-317)
P1705 (5)	Blinks	ON	Transmission range switch (short to ground)	(see page 14-320)
P1706 (6)	OFF	ON	Transmission range switch (open)	(see page 14-323)
P1709 (24)	Blinks	ON	Transmission gear selection switch	(see page 14-326)
P1710 (63)	OFF	OFF	1st-hold switch	(see page 14-328)
P1740 (27)	OFF	OFF	4th clutch pressure switch	(see page 14-330)
P1750 (46)	Blinks	ON	Mechanical problem in hydraulic system	(see page 14-332)
P1751 (47)	Blinks	ON	Mechanical problem in hydraulic system	(see page 14-333)

The DTC in parentheses is the flash code the Ds indicator indicates when the DLC is connected to the Honda PGM Tester in SCS mode (see page 14-219).

Protected by AR

DTC Troubleshooting Index (cont'd)

NOTE: Record all freeze data and review the general troubleshooting information (see page 14-219) before you begin to troubleshoot a DTC.

For Type S Model

DTC	Ds Indicator	MIL	Detection Item	Page
P0710 (28)	Blinks	ON	ATF temperature sensor	(see page 14-292)
P0715 (15)	Blinks	ON	Mainshaft speed sensor	(see page 14-294)
P0720 (9)	Blinks	ON	Countershaft speed sensor	(see page 14-297)
P0730 (41)	OFF	ON	Shift control system	(see page 14-300)
P0740 (40)	OFF	ON	Lock-up control system	(see page 14-301)
P0753 (7)	Blinks	ON	Shift solenoid valve A	(see page 14-306)
P0758 (8)	Blinks	ON	Shift solenoid valve B	(see page 14-308)
P0763 (22)	Blinks	ON	Shift solenoid valve C	(see page 14-310)
P0780 (45)	Blinks	ON	Mechanical problem in hydraulic system	(see page 14-314)
P1656 (37)	OFF	OFF	PCM-to-VSA control unit communications circuit	(see page 14-319)
P1705 (5)	Blinks	ON	Transmission range switch (short to ground)	(see page 14-320)
P1706 (6)	OFF	ON	Transmission range switch (open)	(see page 14-323)
P1709 (24)	Blinks	ON	Transmission gear selection switch	(see page 14-326)
P1710 (63)	OFF	OFF	1st-hold switch	(see page 14-328)
P1739 (26)	OFF	OFF	3rd clutch pressure switch	(see page 14-317)
P1740 (27)	OFF	OFF	4th clutch pressure switch	(see page 14-330)
P1750 (46)	Blinks	ON	Mechanical problem in hydraulic system	(see page 14-332)
P1751 (47)	Blinks	ON	Mechanical problem in hydraulic system	(see page 14-333)
P1753 (1)	Blinks	ON	Torque converter clutch solenoid valve	(see page 14-302)
P1768 (16)	Blinks	ON	A/T clutch pressure control solenoid valve A	(see page 14-304)
P1773 (23)	Blinks	ON	A/T clutch pressure control solenoid valve B	(see page 14-312)
P1778 (29)	Blinks	ON	A/T clutch pressure control solenoid valve C	(see page 14-315)

The DTC in parentheses is the flash code the Ds indicator indicates when the DLC is connected to the Honda PGM Tester in SCS mode (see page 14-219).

BACK

Protected by AR

Symptom Troubleshooting Index

These symptoms DO NOT trigger Diagnostic Trouble Codes (DTCs) or cause the D5 indicator to blink. If the MIL was reported ON or the D5 indicator has been blinking, check for DTCs. But if the vehicle has one of the symptoms in the following chart, check the probable cause(s) for it in the sequence listed, until you find the problem.

Symptom	Probable cause(s)	Notes
When you turn the ignition switch ON (II), the D5 indicator comes on and stays on or never comes on at all	A problem in the D5 indicator circuit	Check the D5 indicator circuit (see page 14-377).
Shift lever cannot be moved from the P position while you're pushing on the brake pedal	A problem in the shift lock system of the interlock system	Check interlock system — shift lock system circuit (see page 14-391).
Ignition key cannot be moved from the ACC (I) position to the LOCK (0) position when you're pushing in key with the shift lever in the P position	A problem in the key interlock system of the interlock system	Check interlock system — key interlock system circuit (see page 14-393).
Transmission does not shift up and down when operating the shift lever in the sequential sportshift mode position	A problem in the sequential sportshift mode switch circuit	Check the sequential sportshift transmission gear selection switch circuit (see page 14-380).
Shift indicator does not indicate the selected gear while the shift lever is in the sequential sportshift mode position	A problem in the shift indicator circuit	Check the shift indicator circuit (see page 14-382).
Shift lever cannot pass through the R position from the N position	A problem in the reverse lock system of the interlock system	Check the interlock system — reverse lock system circuit (see page 14-395).

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Engine runs, but vehicle does not move in any gear	1. Low ATF level 2. Shift cable broken or out of adjustment 3. Shift cable worn 4. ATF pump worn or binding 5. Regulator valve stuck or spring worn 6. ATF strainer clogged 7. Mainshaft worn or damaged 8. Final gears worn or damaged 9. Transmission-to-engine assembly error 10. Axle disengaged	• Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Measure line pressure. • If the strainer is clogged, find the damaged components that caused debris. • Inspect the differential pinion gears for wear. If the differential pinion gears are worn, replace the differential assembly, replace the ATF strainer, thoroughly clean the transmission, and flush the cooler and lines. Replace the torque converter. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage.
Vehicle moves in R, but not in D5, D4, D3, or 1	1. 1st accumulator defective 2. 1st clutch defective	• Inspect 1st clutch pressure. • Inspect the secondary shaft and 1st/1st-hold/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn and damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Vehicle moves in 2 and R, but not in D5, D4, D3, or 1	1. 1st gear one-way clutch defective 2. 1st gears worn or damaged 3. 1st clutch defective	• Inspect 1st clutch pressure. • Inspect the secondary shaft and 1st/1st-hold/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

BACK

Protected by AR

Symptom	Probable cause(s)	Notes
Vehicle moves in D5, D4, D3, 2 and R, but not in 1	1. 1st-hold accumulator defective 2. 1st-hold clutch defective	• Inspect 1st-hold clutch pressure. • Inspect the secondary shaft and 1st/1st-hold/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Vehicle moves in D5, D4, D3, 1, R, but not in 2	1. 2nd accumulator defective 2. 2nd gears worn or damaged 3. 2nd clutch defective	• Inspect the secondary shaft and 1st/1st-hold/2nd clutch assembly for wear and damage. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Vehicle moves in D5, D4, D3, 2, 1, but not in R (or moves forward in R)	1. Shift fork shaft stuck 2. Modulator valve defective 3. Reverse CPC valve defective 4. 5th accumulator defective 5. 5th clutch defective 6. Reverse gears worn or damaged	• Measure line pressure and 5th clutch pressure. • Check for a missing shift fork bolt on the shift fork shaft. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter. • Inspect the reverse selector gear teeth chamfers, and inspect engagement teeth chamfers of the countershaft 5th gear and reverse gear. Replace the reverse gears and the reverse selector if they are worn or damaged. If the transmission makes clicking, grinding, or whirring noises, also replace the mainshaft 5th gear, reverse idler gear, and countershaft 5th gear. • If the 5th clutch feed pipe guide in the end cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If the ball bearing is OK, replace the end cover as it is dented. The O-ring under the guide is probably worn. • Replace the mainshaft if the bushing for the 4th and 5th clutch feed pipes are loose or damaged. If the 5th clutch feed pipe is damaged or out of round, replace the end cover. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clearance with the clutch end plate.

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Poor acceleration; flares on starting off in D5, D4 and D3: Stall speed high in D5, D4, D3, 2, and 1	1. Low ATF level 2. Shift cable broken or out of adjustment 3. ATF pump worn or binding 4. Regulator valve stuck or spring worn 5. ATF strainer clogged 6. Torque converter check valve defective	• Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission control shaft. • Check line pressure. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptom is mostly an rpm-ticking noise or a high pitched squeak. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools.
Poor acceleration; flares on starting off in D5, D4 and D3: Stall speed high in 2	2nd clutch defective	• Check 2nd clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Poor acceleration; flares on starting off in R: Stall speed high in R	1. Shift cable broken or out of adjustment 2. 5th clutch defective	• Check for a loose shift cable at the shift lever and the transmission control shaft. • Check 5th clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

BACK

Protected by AR

Symptom	Probable cause(s)	Notes
Poor acceleration; Stall speed low	1. Torque converter clutch solenoid valve defective 2. Torque converter one-way clutch defective 3. Engine output low 4. Lock-up clutch piston defective 5. Lock-up shift valve defective 6. Restricted ATF warmer	• Check ATF cooling system for restriction. • Check for a stuck lock-up valve in the valve body.
Engine idle vibration	1. Low ATF level 2. Torque converter clutch solenoid valve defective 3. Drive plate defective or transmission misassembled 4. Engine output low 5. Lock-up clutch piston defective 6. ATF pump worn or binding 7. Lock-up shift valve defective 8. Restricted ATF warmer	• Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine and transmission mounts as outlined in the engine section of this service manual. • Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Check ATF cooling system for restriction.
Vehicle moves in [N]	1. Excessive ATF 2. Foreign material in separator plate orifice 3. Relief valve defective 4. 1st-hold clutch defective 5. 1st clutch defective 6. 2nd clutch defective 7. 3rd clutch defective 8. 4th clutch defective 9. 5th clutch defective 10. Clutch clearance incorrect 11. Needle bearing seized up, worn, or damaged 12. Thrust washer seized up, worn, or damaged	• Check the ATF level, and drain the ATF if necessary. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance. • Check for clutch pressure in neutral.

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Late shift from the N position to the D5, D4 and D3 positions	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. A/T clutch pressure control solenoid valve C defective 4. Shift cable broken or out of adjustment 5. Joint in shift cable and transmission or body worn 6. Mainshaft speed sensor defective 7. Countershaft speed sensor defective 8. ATF temperature sensor defective 9. CPC valve C stuck 10. Foreign material in separator plate orifice 11. Shift valve C defective 12. Shift valve E defective 13. Servo control valve defective 14. 1st accumulator defective 15. 1st check ball stuck 16. 1st clutch defective	• Check the D5 indicator, and check for loose connectors. Inspect the O-ring, and check the shift solenoid valve for seizure. • Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Check for a loose shift cable at the shift lever and the transmission control shaft. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter. • Check 1st clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Late shift from the N position to the R position	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. A/T clutch pressure control solenoid valve C defective 4. Shift cable broken or out of adjustment 5. Joint in shift cable and transmission or body worn 6. Mainshaft speed sensor defective 7. Countershaft speed sensor defective 8. ATF temperature sensor defective 9. Shift fork shaft stuck 10. CPC valve C stuck 11. Reverse CPC valve defective 12. Foreign material in separator plate orifice 13. Shift valve E defective 14. 5th accumulator defective 15. 5th clutch defective	• Check the D5 indicator, and check for loose connectors. Inspect the O-ring, and check the shift solenoid valve for seizure. • Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Check for a loose shift cable at the shift lever and the transmission control shaft. • If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter. • Check 5th clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

BACK

Protected by AR

Symptom	Probable cause(s)	Notes
No shift	1. Mainshaft speed sensor defective 2. Countershaft speed sensor defective 3. Modulator valve defective	• Check the D5 indicator, and check for loose connectors. • Measure line pressure.
Erratic shifting gears: Fails to shift in the D5, D4 and D3 positions; starts off in 5th. Fails to shift in the 2 position; starts off in 4th	1. Shift solenoid valve B defective 2. Shift valve B defective	Check the D5 indicator, and check for loose connectors. Inspect the O-ring, and check the shift solenoid valve for seizure.
Erratic shifting gears: Fails to shift in the D5, D4, D3 and 1 positions; starts off in 3rd	1. Shift solenoid valve A defective 2. Shift valve A defective	Check the D5 indicator, and check for loose connectors. Inspect the O-ring, and check the shift solenoid valve for seizure.
Excessive shock, or flares on all upshifts and downshifts	1. A/T clutch pressure control solenoid valves A and B defective 2. Mainshaft speed sensor defective 3. Countershaft speed sensor defective 4. ATF temperature sensor defective 5. CPC valve A defective 6. Foreign material in separator plate orifice	Check the D5 indicator, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. Inspect the sensor O-rings.
Excessive shock, or flares on 1-2 upshift or 2-1 downshift	1. Foreign material in separator plate orifice 2. 2nd accumulator defective 3. 2nd check ball stuck 4. 2nd clutch defective	• Check 1st and 2nd clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Excessive shock, or flares on 2-3 upshift or 3-2 downshift	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. 3rd clutch pressure switch defective 4. CPC valve B defective 5. Foreign material in separator plate orifice 6. Shift valve C defective 7. 2nd accumulator defective 8. 3rd accumulator defective 9. 2nd check ball stuck 10. 2nd clutch defective 11. 3rd clutch defective	• Check the D5 indicator, and check for loose connectors. Inspect the O-rings, and check the shift solenoid valve for seizure. • Check for clogged orifice in the clutch pressure switch connector. If the orifice is clogged, remove it and clean the connector. • Check 2nd and 3rd clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Excessive shock, or flares on 3-4 upshift or 4-3 downshift	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. 4th clutch pressure switch defective 4. CPC valve B defective 5. Foreign material in separator plate orifice 6. Shift valve C defective 7. 3rd accumulator defective 8. 4th accumulator defective 9. 3rd clutch defective 10. 4th clutch defective	• Check the D5 indicator, and check for loose connectors. Inspect the O-rings, and check the shift solenoid valve for seizure. • Check for clogged orifice in the clutch pressure switch connector. If the orifice is clogged, remove it and clean the connector. • Check 3rd and 4th clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.
Excessive shock, or flares on 4-5 upshift or 5-4 downshift	1. Shift solenoid valve C defective 2. A/T clutch pressure control solenoid valves A and B defective 3. A/T clutch pressure control solenoid valve C defective 4. CPC valve B defective 5. CPC valve C defective 6. Foreign material in separator plate orifice 7. Shift valve C defective 8. Shift valve E defective 9. Kick-down valve or kick-down short valve defective 10. 4th accumulator defective 11. 5th accumulator defective 12. 4th clutch defective 13. 5th clutch defective	• Check the D5 indicator, and check for loose connectors. Inspect the O-rings, and check the shift solenoid valve for seizure. • Check 4th and 5th clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn or damaged, replace them as a set. If they are OK, adjust the clutch end plate clearance.

BACK

Protected by AR

Symptom	Probable cause(s)	Notes
Noise from transmission in all shift lever positions	1. ATF pump worn or binding 2. Torque converter housing or transmission housing bearing worn or damaged	• Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Inspect the contact of the countershaft and secondary shaft with the bearings. Check the ATF guide plates for damage and wear. Inspect the 1st clutch feed pipe for damage and out of round. If the 1st clutch feed pipe is damaged or out of round, replace it. Replace the secondary shaft if the bushing for the 1st clutch feed pipe is damaged or out of round.
Vehicle does not accelerate more than 31 mph (50 km/h)	Torque converter one-way clutch defective	Replace torque converter.
Vibration in all shift lever positions	Drive plate defective or transmission misassembled	• Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine mounts as described in the engine section of this service manual. • Check the stall speed.
Shift lever does not operate smoothly	1. Transmission range switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable and transmission or body worn	• Check the D5 indicator, and check for loose connectors. Inspect the transmission range switch. If the transmission range switch is faulty, replace it. If the transmission range switch is out of adjustment, adjust it and the shift cable. • Check for a loose shift cable at the shift lever and the transmission control shaft.
Transmission does not shift into the P position	1. Shift cable broken or out of adjustment 2. Joint in shift cable and transmission or body worn 3. Park mechanism defective	• Check for a loose shift cable at the shift lever and the transmission control shaft. • Check the park pawl spring installation and the park lever spring installation. If installation is incorrect, install the spring correctly. Make sure that the park lever stop is not installed upside down. Check the distance between the park pawl shaft and the park lever roller pin. If the distance is out of tolerance, adjust the distance with the park lever stop.
Lock-up clutch does not disengage	1. Torque converter clutch solenoid valve defective 2. A/T clutch pressure control solenoid valve C defective 3. Lock-up clutch piston defective 4. Lock-up shift valve defective 5. Lock-up control valve defective 6. Lock-up timing valve defective 7. Restricted ATF warmer	• Check the D5 indicator, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Check ATF cooling system for restriction.

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Lock-up clutch does not operate smoothly	1. Torque converter clutch solenoid valve defective 2. A/T clutch pressure control solenoid valve C defective 3. Lock-up clutch piston defective 4. Torque converter check valve defective 5. Lock-up shift valve defective 6. Lock-up control valve defective 7. Lock-up timing valve defective 8. Non-Honda ATF used	• Check the D5 indicator, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves. • Center all engine mounts.
Lock-up clutch does not engage	1. Torque converter clutch solenoid valve defective 2. A/T clutch pressure control solenoid valve C defective 3. Mainshaft speed sensor defective 4. Countershaft speed sensor defective 5. Lock-up clutch piston defective 6. Torque converter check valve defective 7. Lock-up shift valve defective 8. Lock-up control valve defective	Check the D5 indicator, and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves.
A/T gear position indicator does not indicate shift lever positions	1. Transmission range switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable and transmission or body worn	• Check the D5 indicator, and check for loose connectors. Inspect the transmission range switch. If the transmission range switch is faulty, replace it. If the transmission range switch is out of adjustment, adjust it and the shift cable. • Check for a loose shift cable at the shift lever and the transmission control shaft.
Speedometer and odometer do not operate	Countershaft speed sensor defective	Check the D5 indicator, and check for loose connectors.
Engine does not rev up high speed, and the transmission shifts up during low-rev condition. (Engine is warmed up to normal operating temperature)	Engine rocker arms defective	Check the engine rocker arms as described in the engine section of this service manual.

BACK

Protected by AR

System Description

General Operation

The automatic transmission is a combination of a 3-element torque converter and triple-shaft electronically controlled unit which provides 5 speeds forward and 1 reverse. The entire unit is positioned in line with the engine.

Torque Converter, Gears, and Clutches

The torque converter consists of a pump, turbine, and stator assembly in a single unit. They are connected to the engine crankshaft so they turn together as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel, transmitting power to the transmission mainshaft. The transmission has three parallel shafts: the mainshaft, the countershaft, and the secondary shaft. The mainshaft is in line with the engine crankshaft. The mainshaft includes the 4th and 5th clutches, and gears for 3rd, 4th, 5th, and reverse, (reverse gear is integral with the 5th gear). The countershaft includes the 3rd clutch, and gears for the final drive, 1st, 4th, 5th, reverse, 2nd, park, and 3rd (the final drive gear is integral with the countershaft). The secondary shaft includes the 1st, 1st-hold and 2nd clutches, and gears for 1st, 2nd, and idler. The countershaft 5th gear and the countershaft reverse gear can be locked to the countershaft at its center, providing 5th gear or reverse, depending with which way the selector moved. The gears on the mainshaft and the secondary shaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted from the mainshaft and the secondary shaft to the countershaft to provide D5, D4, D3, 2, 1, and R positions.

Electronic Control

The electronic control system consists of the powertrain control module (PCM), sensors, and seven solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel behind the center console.

Hydraulic Control

The valve bodies include the main valve body, the regulator valve body, the servo body, and the accumulator body. They are bolted to the torque converter housing. The main valve body contains the manual valve, the modulator valve, the shift valve C, the shift valve D, the kick-down valve, the servo control valve, the torque converter check valve, the reverse CPC valve, the lock-up shift valve, the relief valve, the cooler check valve, and the ATF pump gears. The regulator valve body contains the regulator valve, the lock-up timing valve, and the lock-up control valve. The servo body contains the servo valve, the shift valve A, the shift valve B, the CPC valves A and B. The top accumulator body contains shift valve E, CPC valve C, 1st-hold accmulator piston, 4th accumulator piston, and 5th accumulator piston. The accumulator body contains the 1st and 2nd accumulators and lubrication check valve. Fluid from the regulator passes through the manual valve to the various control valves. The 1st/1st-hold, 3rd, 4th and 5th clutches receive fluid from their respective feed pipes, and the 2nd clutch receives fluid from the internal hydraulic circuit.

Shift Control Mechanism

The PCM controls shift solenoid valves A, B, and C, and A/T clutch pressure control solenoid valves A and B while receiving input signals from various sensors and switches located throughout the vehicle. The shift solenoid valves shift the positions of the shift valves to switch the port leading hydraulic pressure to the clutch. The A/T clutch pressure control solenoid valves A and B control the CPC valves A and B to shift smoothly between lower gear and higher gear. This pressurizes a line to one of the clutches, engaging the clutch and its corresponding gear.

Lock-up Mechanism

In D5 position (3rd, 4th and 5th), in D4 position (3rd and 4th) and D3 position (3rd), pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, the PCM optimizes the timing of the lock-up mechanism. When the torque converter clutch solenoid valve activates, modulator pressure changes to switch lock-up on and off. The lock-up control valve and the lock-up timing valve control the range of lock-up according to A/T clutch pressure control solenoid valve C. The torque converter clutch solenoid valve is mounted on the torque converter housing, and A/T clutch pressure control solenoid valve C is mounted on the transmission housing. They are all controlled by the PCM.

(cont'd)

BACK

Protected by AR

System Description (cont'd)

Gear Selection
The shift lever has nine positions: [P] PARK, [R] REVERSE, [N] NEUTRAL, [D5] 1st through 5th gear ranges, [D4] 1st through 4th gear ranges, [D3] 1st through 3rd gear ranges, [2] 2nd gear, [1] 1st gear, and the sequential sportshift mode position.

Position	Description
[P] PARK	Front wheels locked; park pawl engaged with park gear on countershaft. All clutches are released.
[R] REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th clutch locked.
[N] NEUTRAL	All clutches are released.
[D5] DRIVE (1st through 5th)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, 4th then 5th, depending on vehicle speed and throttle position. Downshift through 4th, 3rd, 2nd, and 1st on deceleration to stop. The lock-up mechanism operates in 3rd, 4th and 5th gear.
[D4] DRIVE (1st through 4th)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshift through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism operates in 3rd and 4th gear.
[D3] DRIVE (1st through 3rd)	Used for rapid acceleration at highway speeds and general driving; up-hill and down-hill driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to stop. The lock-up mechanism operates in 3rd gear.
[2] SECOND	Used for engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear, does not shift up or down.
[1] FIRST	Used for engine braking; stays in 1st gear, does not shift up.

Starting is possible only in the [P] and [N] positions because of a slide-type neutral-safety switch.

Automatic Transaxle (A/T) Gear Position Indicator
The A/T gear position indicator in the instrument panel shows which gear has been selected without having to look down at the console. With the shift lever in the sequential sportshift mode position, the indicator light next to the [D5] indicator in the instrument panel will display the gear selected.

BACK

Protected by AR

Clutches

The 5-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. When hydraulic pressure is introduced into the clutch drum, the clutch piston moves. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear. Likewise, when the hydraulic pressure is bled from the clutch pack, the piston releases the friction discs and the steel plates, and they are free to slide past each other. This allows the gear to spin independently on its shaft, transmitting no power.

1st Clutch
The 1st clutch engages/disengages 1st gear, and is located at the middle of the secondary shaft. The 1st clutch is joined back-to-back to the 2nd clutch. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft.

1st-hold Clutch
The 1st-hold clutch engages/disengages 1st-hold or 1 position, and is located in the 1st clutch drum. The 1st-hold clutch is supplied hydraulic pressure through the orifice inside the secondary shaft by a circuit connected to the internal hydraulic circuit.

2nd Clutch
The 2nd clutch engages/disengages 2nd gear, and is located at the middle of the secondary shaft. The 2nd clutch is joined back-to-back to the 1st clutch. The 2nd clutch is supplied hydraulic pressure through the secondary shaft by a circuit connected to the internal hydraulic circuit.

3rd Clutch
The 3rd clutch engages/disengages 3rd gear, and is located at the end of the countershaft, just behind the end cover. The 3rd clutch is supplied hydraulic pressure by its ATF feed pipe in the countershaft.

4th Clutch
The 4th clutch engages/disengages 4th gear, and is located at the middle of the mainshaft. The 4th clutch is joined back-to-back to the 5th clutch. The 4th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

5th Clutch
The 5th clutch engages/disengages 5th gear, as well as reverse gear, and is located at the middle of the mainshaft. The 5th clutch is joined back-to-back to the 4th clutch. The 5th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

One-way Clutch
The one-way clutch is positioned between the 1st clutch hub and the secondary shaft 1st gear. The secondary shaft 1st gear is splined to the 1st-hold clutch hub, with the 1st-hold clutch hub splined to the secondary shaft. The secondary shaft 1st gear provides the outer race surface, and the 1st clutch hub provides the inner race surface. The one-way clutch locks when power is transmitted from the secondary shaft 1st gear to the countershaft 1st gear. The 1st clutch and gears remain engaged in the 1st, 2nd, 3rd, 4th, and 5th gear ranges in the D5, D4, D3 or 2 position.
However, the one-way clutch disengages when the 2nd, 3rd, 4th, or 5th clutches and gears are applied in the D5, D4, D3 or 2 position. This is because the increased rotational speed of the gears on the secondary shaft overrides the locking "speed range" of the one-way clutch. Thereafter, the one-way clutch free-wheels with the 1st clutch still engaged.

(cont'd)

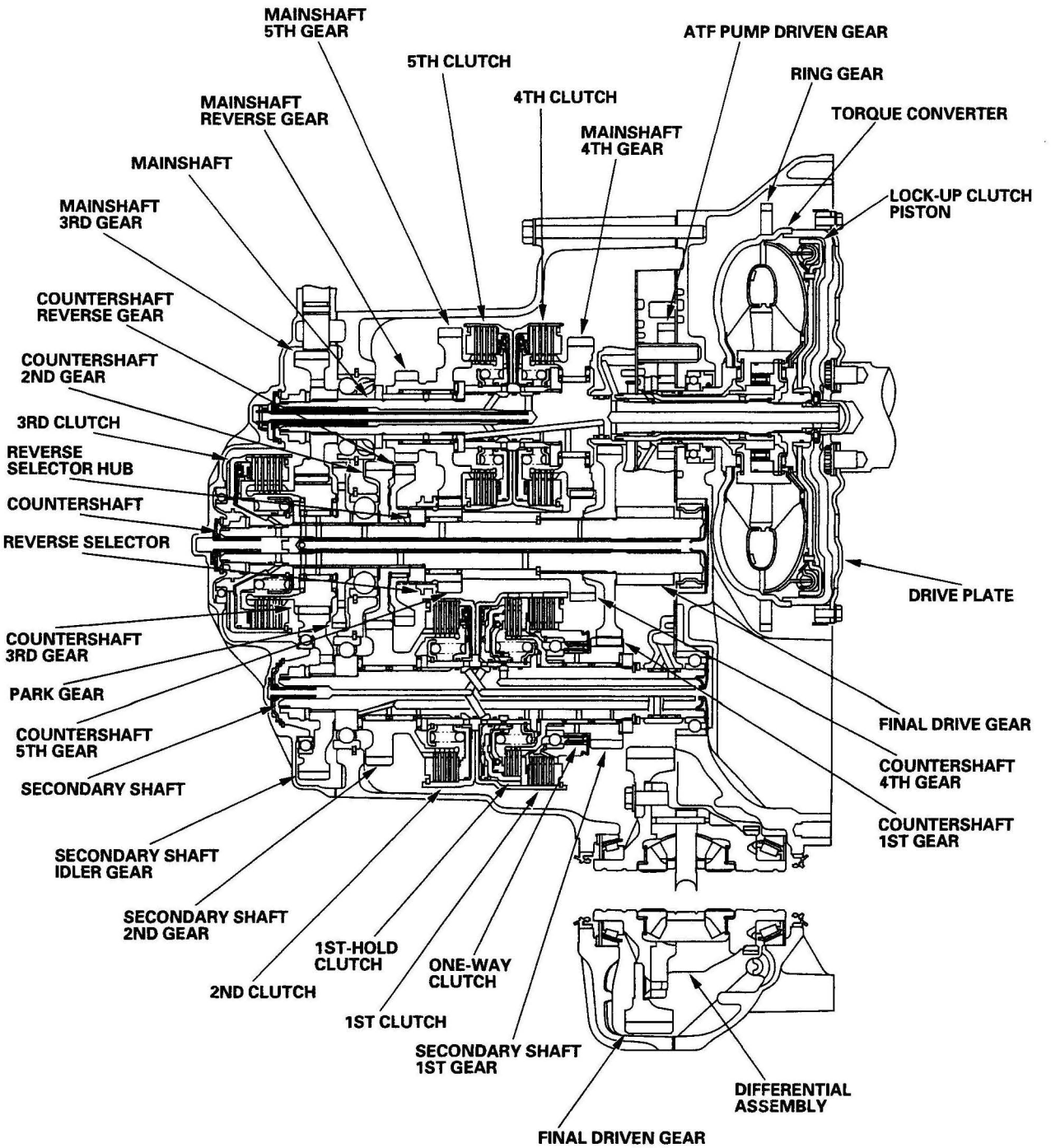
BACK

Protected by AR

System Description (cont'd)

Power Flow

Transmission Sectional View



BACK

Protected by AR

Gear operation

Gears on the mainshaft:

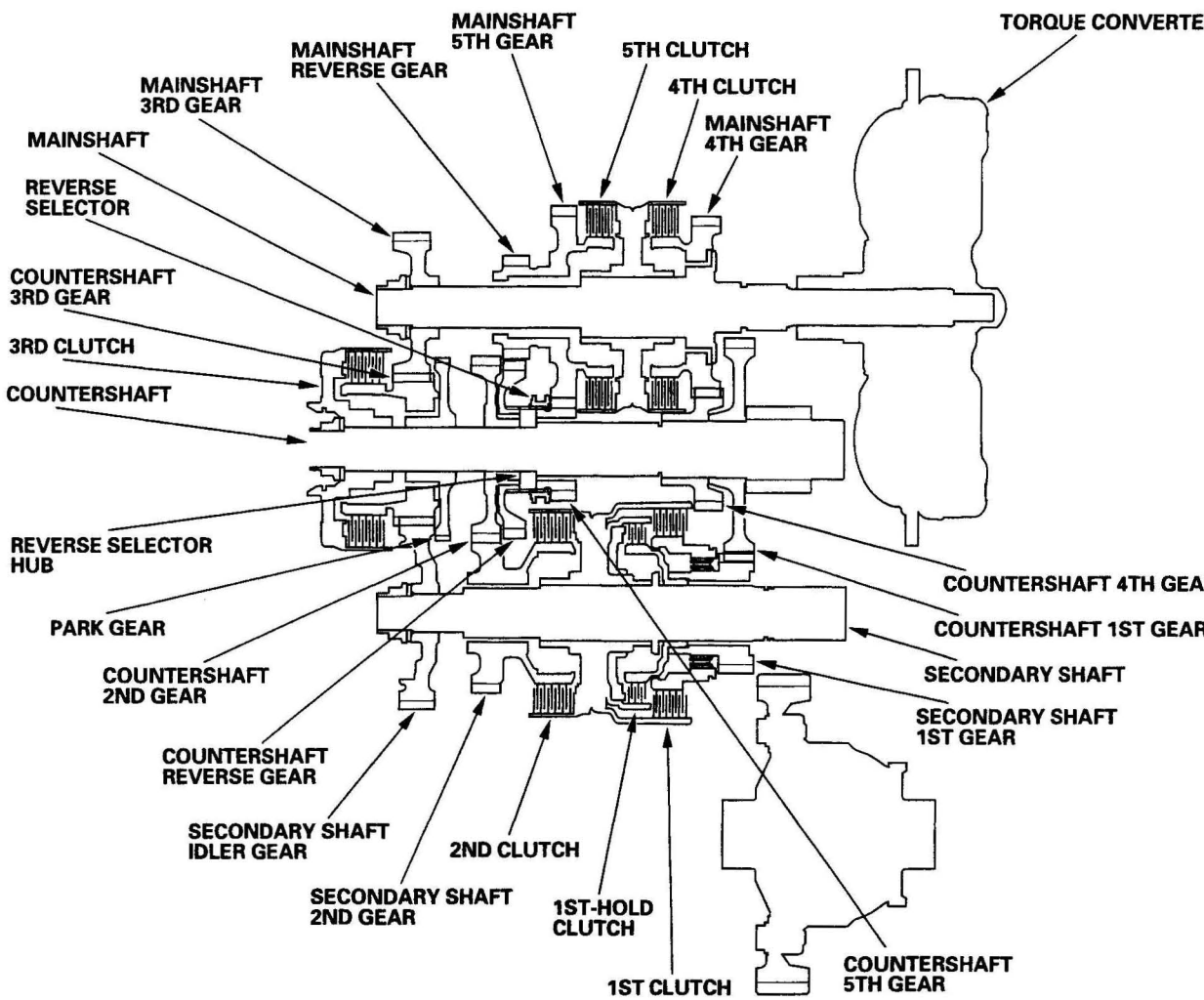
- 4th gear is engaged/disengaged with the mainshaft by the 4th clutch.
- 5th gear is engaged/disengaged with the mainshaft by the 5th clutch.
- Reverse gear is engaged/disengaged with the mainshaft by the 5th clutch.
- 3rd gear is splined with the mainshaft and rotates with the mainshaft.

Gears on the countershaft:

- The final gear is integral with the countershaft.
- 1st gear, 4th gear, 2nd gear and park gear are splined with the countershaft, and rotate with the countershaft.
- 5th gear and reverse gear rotate freely from the countershaft. The reverse selector engages 5th gear and reverse gear with the reverse selector hub. The reverse selector hub is splined to the countershaft so 5th gear and reverse gear engage with the countershaft.
- 3rd gear is engaged/disengaged with the countershaft by the 3rd clutch.

Gears on the secondary shaft:

- 1st gear is engaged/disengaged with the secondary shaft by the 1st clutch. The 1st gear is engaged with the secondary shaft by the 1st-hold clutch and the one-way clutch when decelerating using for engine braking.
- 2nd gear is engaged/disengaged with the secondary shaft by the 2nd clutch.
- Idler gear is splined with the secondary shaft, and rotates with the secondary shaft.



(cont'd)

BACK

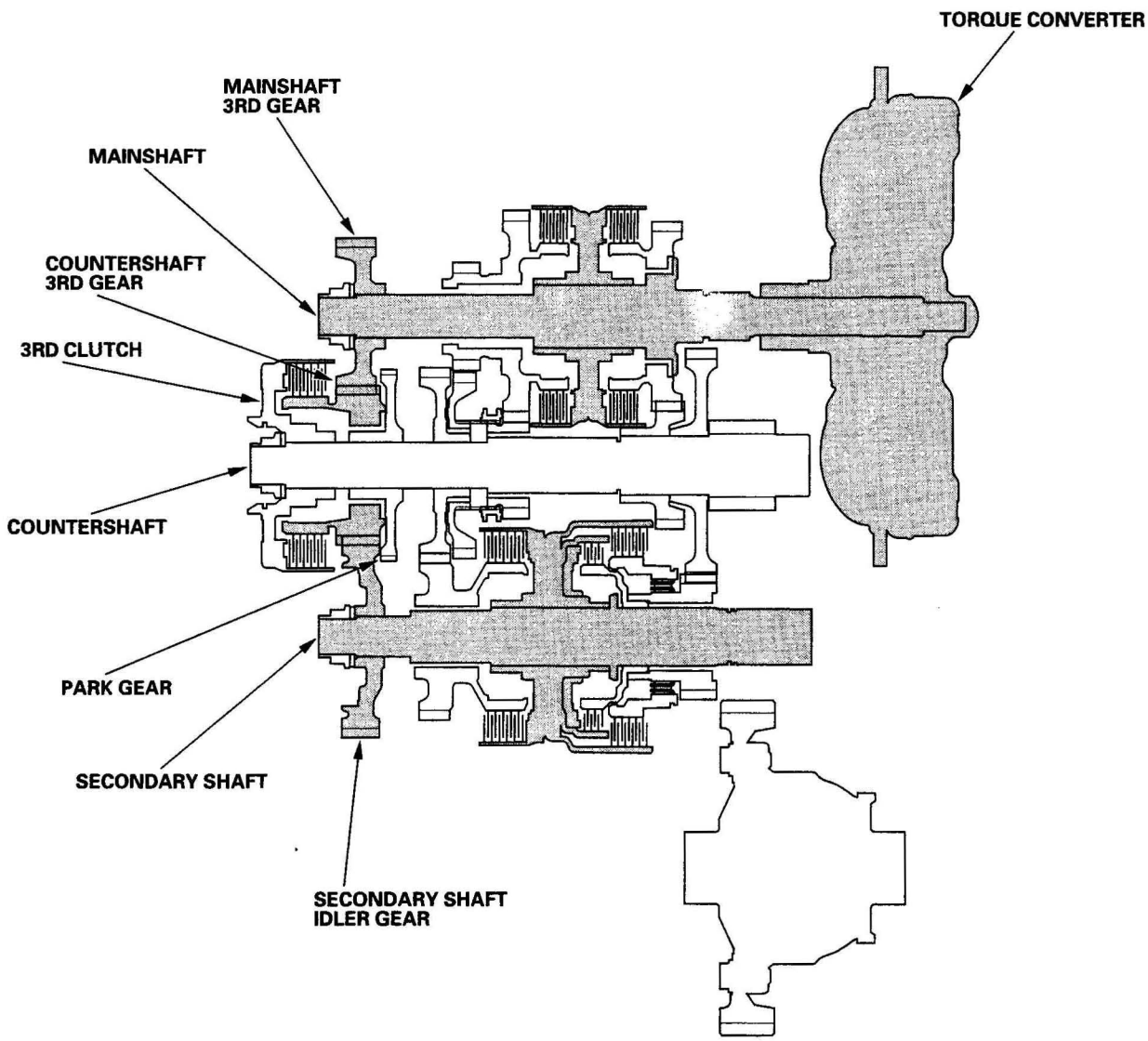
Protected by AR

System Description (cont'd)

Power Flow (cont'd)

[P] Position
Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft is locked by the park pawl interlocking the park gear.

[N] Position
Engine power transmitted from the torque converter drives the mainshaft 3rd gear, the countershaft 3rd gear, and the secondary shaft idler gear, but hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft 5th gear is engaged with the reverse selector hub and the countershaft by the reverse selector, when the shift lever is shifted in the [N] position from the forward range ([D5], [D4], [D3], [2], [1] positions). The countershaft reverse gear is engaged when shifted from the [R] position.



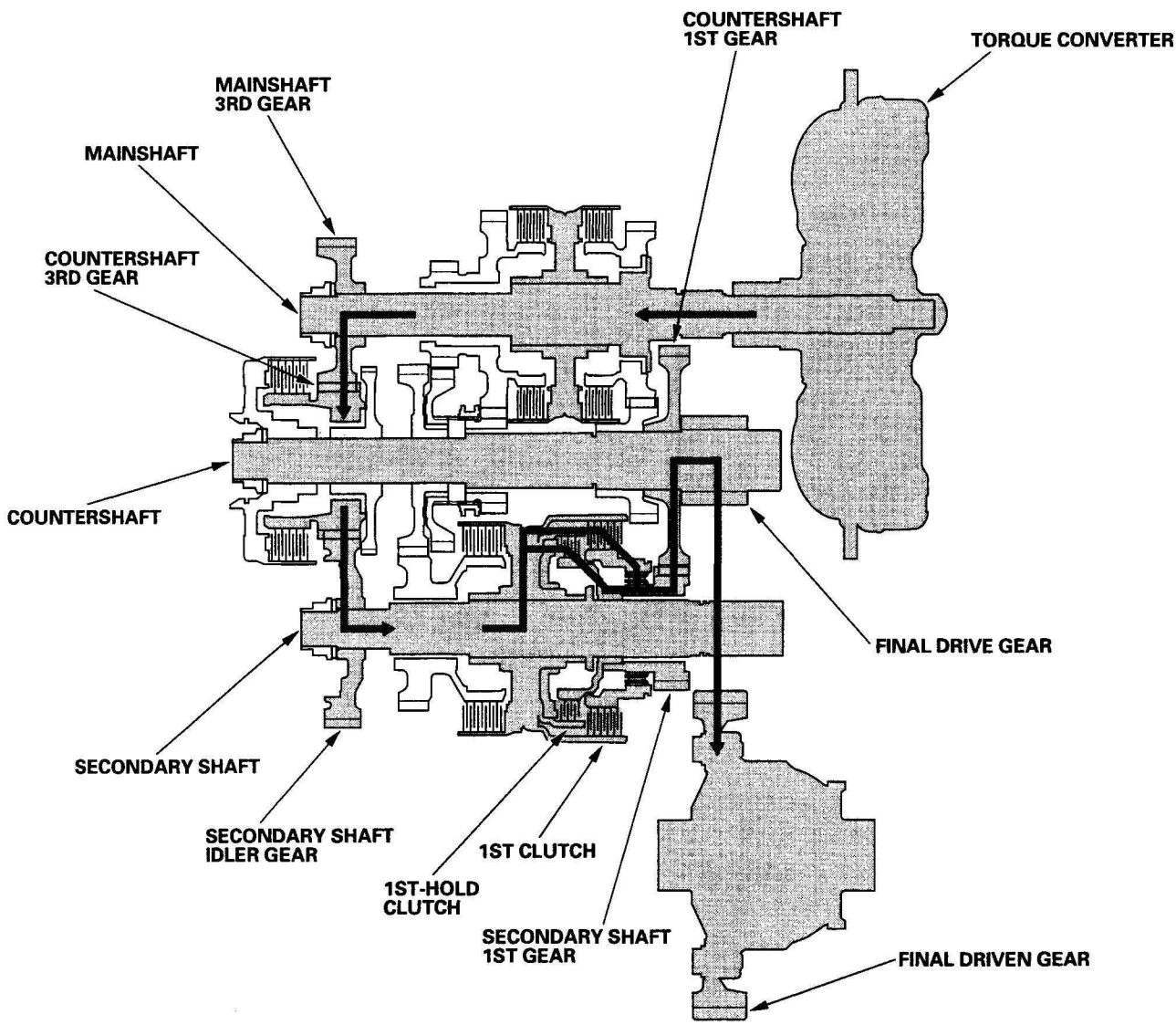
BACK

Protected by AR

[1] Position

In [1] position, hydraulic pressure is applied to the 1st clutch and the 1st-hold clutch.
The power flow when accelerating is as follows:

- Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft by the one-way clutch.
- Hydraulic pressure is also applied to the 1st-hold clutch, and the 1st-hold clutch engages the secondary shaft 1st gear with the secondary shaft.
- The mainshaft 3rd gear drives the secondary shaft via the countershaft 3rd gear and the secondary shaft idler gear.
- The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.



(cont'd)

BACK

Protected by AR

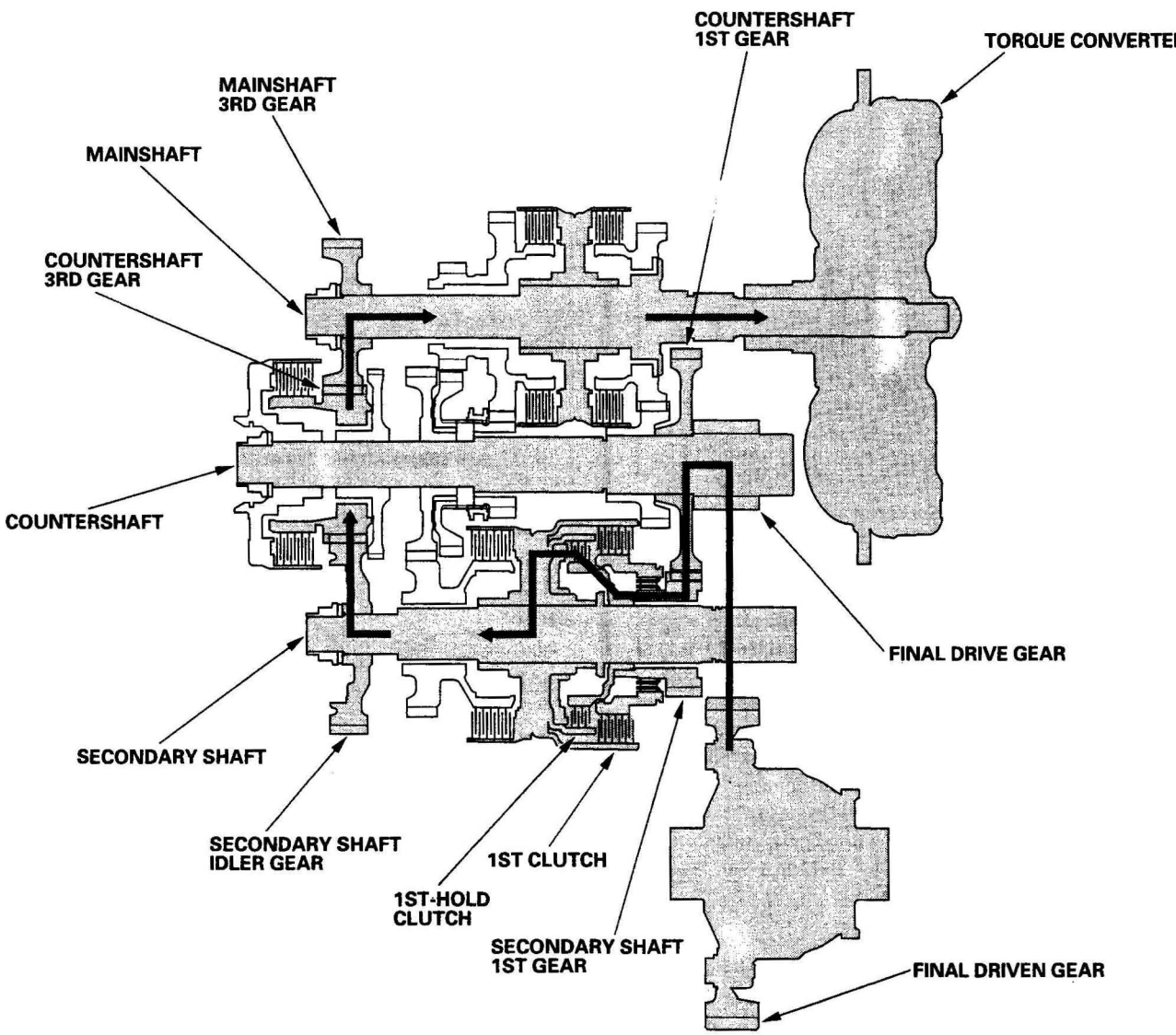
System Description (cont'd)

Power Flow (cont'd)

1 Position

The power flow when decelerating is as follows:

- Hydraulic pressure is applied to the 1st clutch and the 1st-hold clutch. Rolling resistance from the road surface goes through the front wheels to the final drive gear, then to the secondary shaft idler gear.
- The one-way clutch disengages because the application of torque is reversed.
- The counterforce conveyed to the secondary shaft idler gear turns the mainshaft 3rd gear via the countershaft 3rd gear. As a result, engine braking can be obtained with 1st gear.



BACK

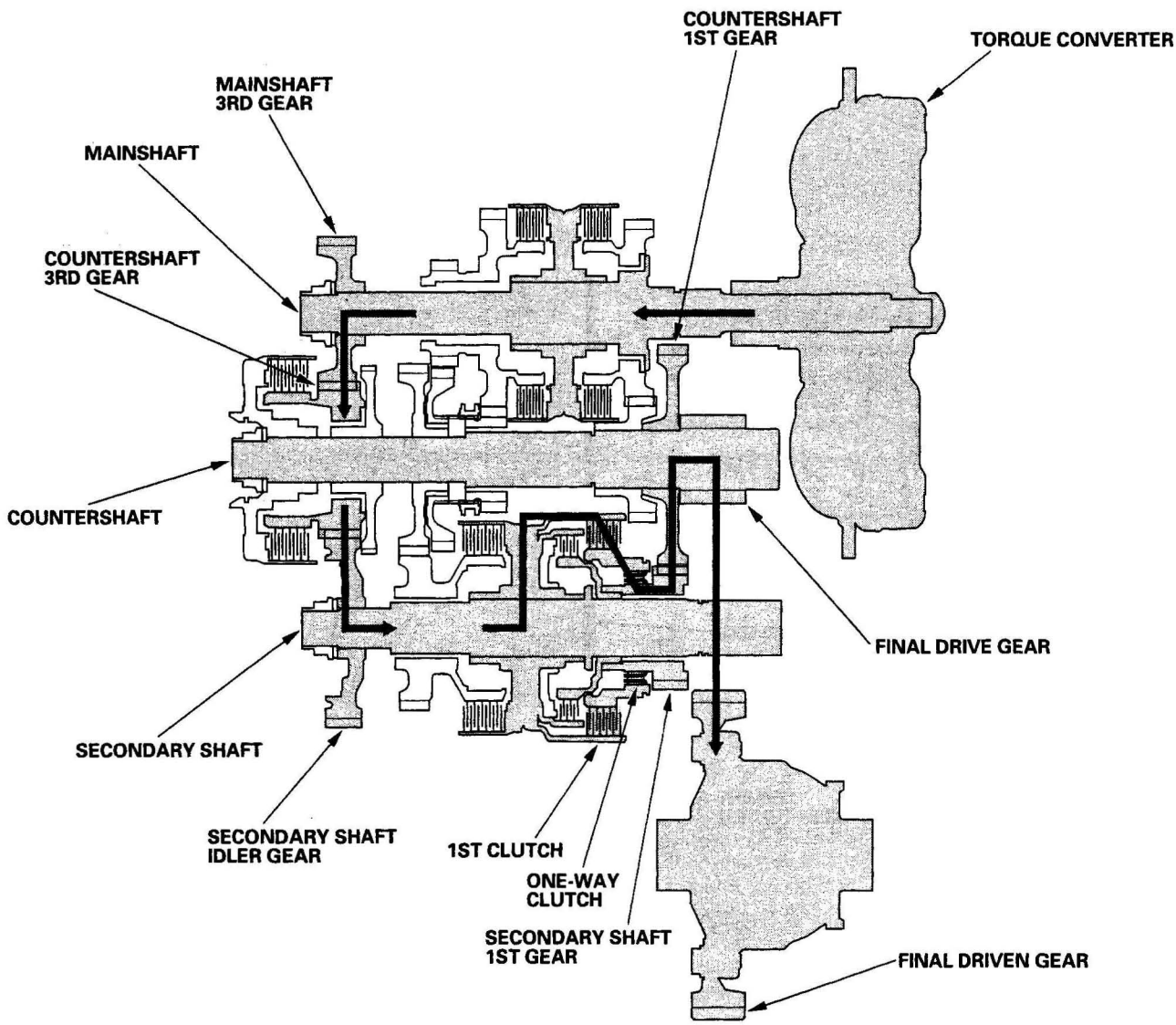
Protected by AR

D5, D4 and D3 Positions

In D5, D4 or D3 position, the optimum gear is automatically selected from the 1st, 2nd, 3rd, 4th, and 5th gears according to conditions such as the balance between the throttle opening (engine loading) and vehicle speed.

D5, D4 or D3 Position in 1st gear

- Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft.
- The mainshaft 3rd gear drives the secondary shaft via the countershaft 3rd gear and secondary shaft idler gear.
- The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.



(cont'd)

BACK

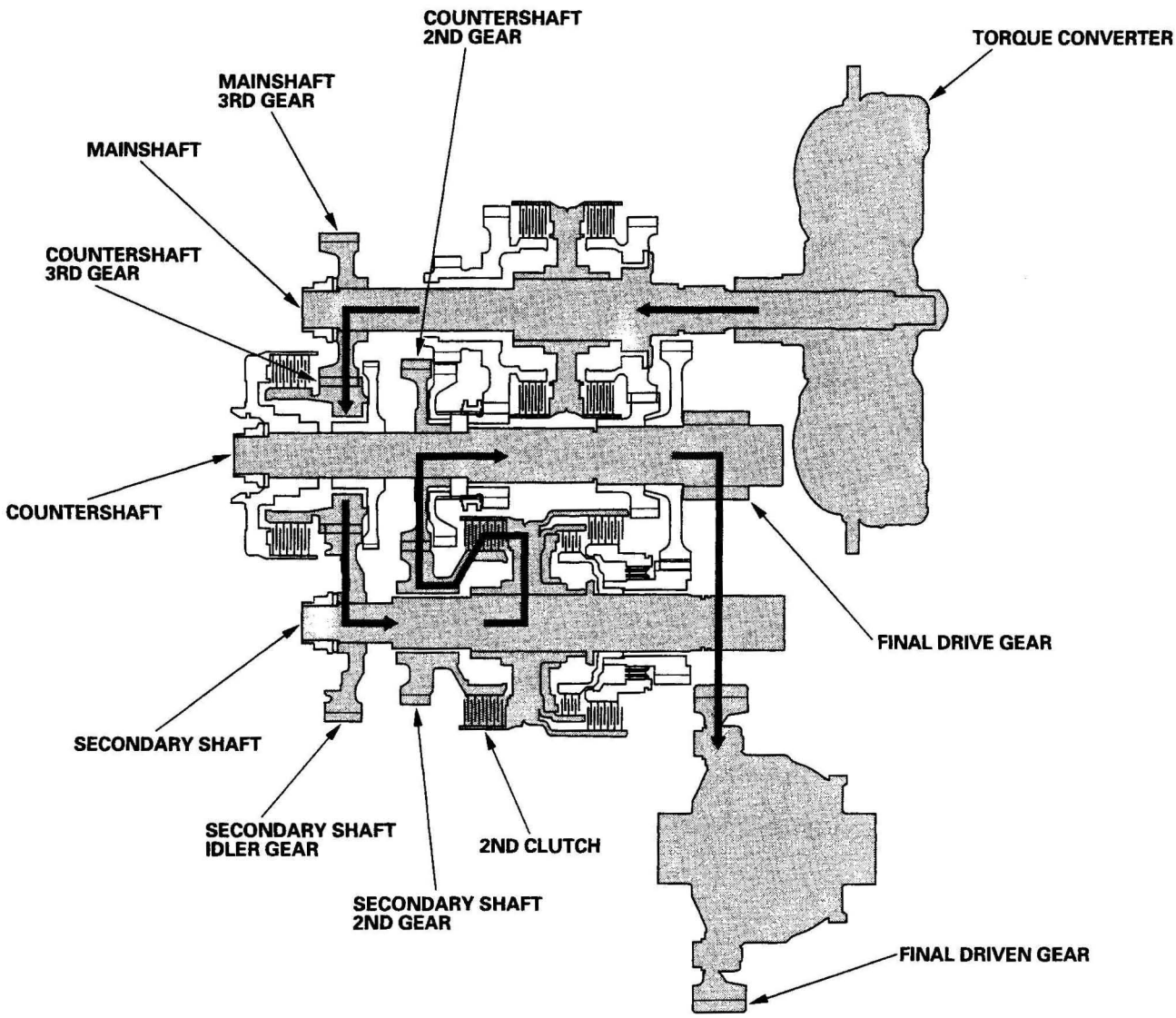
Protected by AR

System Description (cont'd)

Power Flow (cont'd)

D5, D4 or D3 Position in 2nd gear and 2 Position

- Hydraulic pressure is applied to the 2nd clutch, then the 2nd clutch engages the secondary shaft 2nd gear with the secondary shaft.
- The mainshaft 3rd gear drives the secondary shaft via the countershaft 3rd gear and secondary shaft idler gear.
- The secondary shaft 2nd gear drives the countershaft 2nd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 2nd gear exceeds that of 1st gear, power from 1st gear cut off at the one-way clutch.

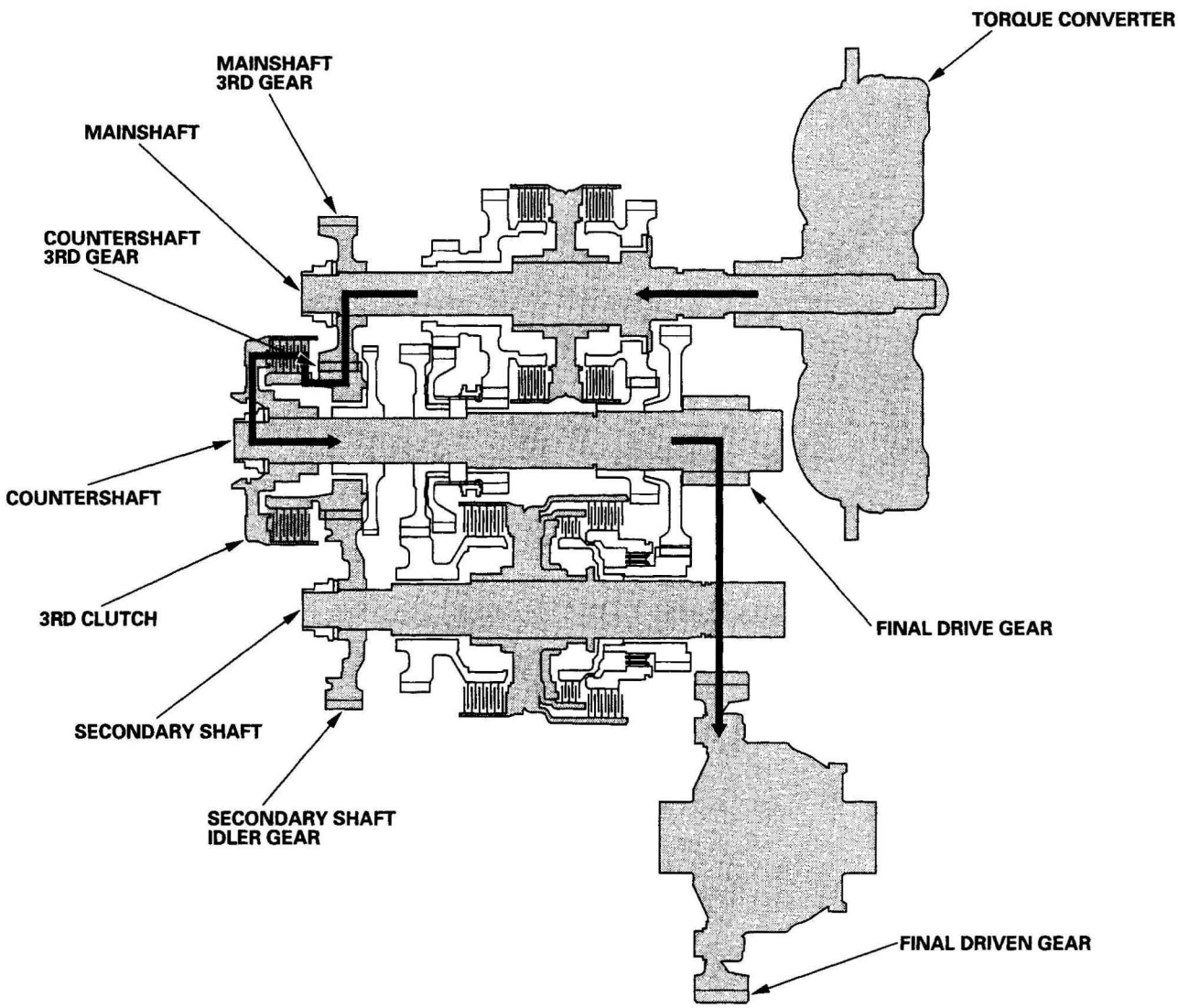


BACK

Protected by AR

D5, D4 or D3 Position in 3rd gear

- Hydraulic pressure is applied to the 3rd clutch, then the 3rd clutch engages the countershaft 3rd gear with the countershaft.
- The mainshaft 3rd gear drives the countershaft 3rd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 3rd gear exceeds that of 1st gear, power from 1st gear cut off at the one-way clutch.



(cont'd)

BACK

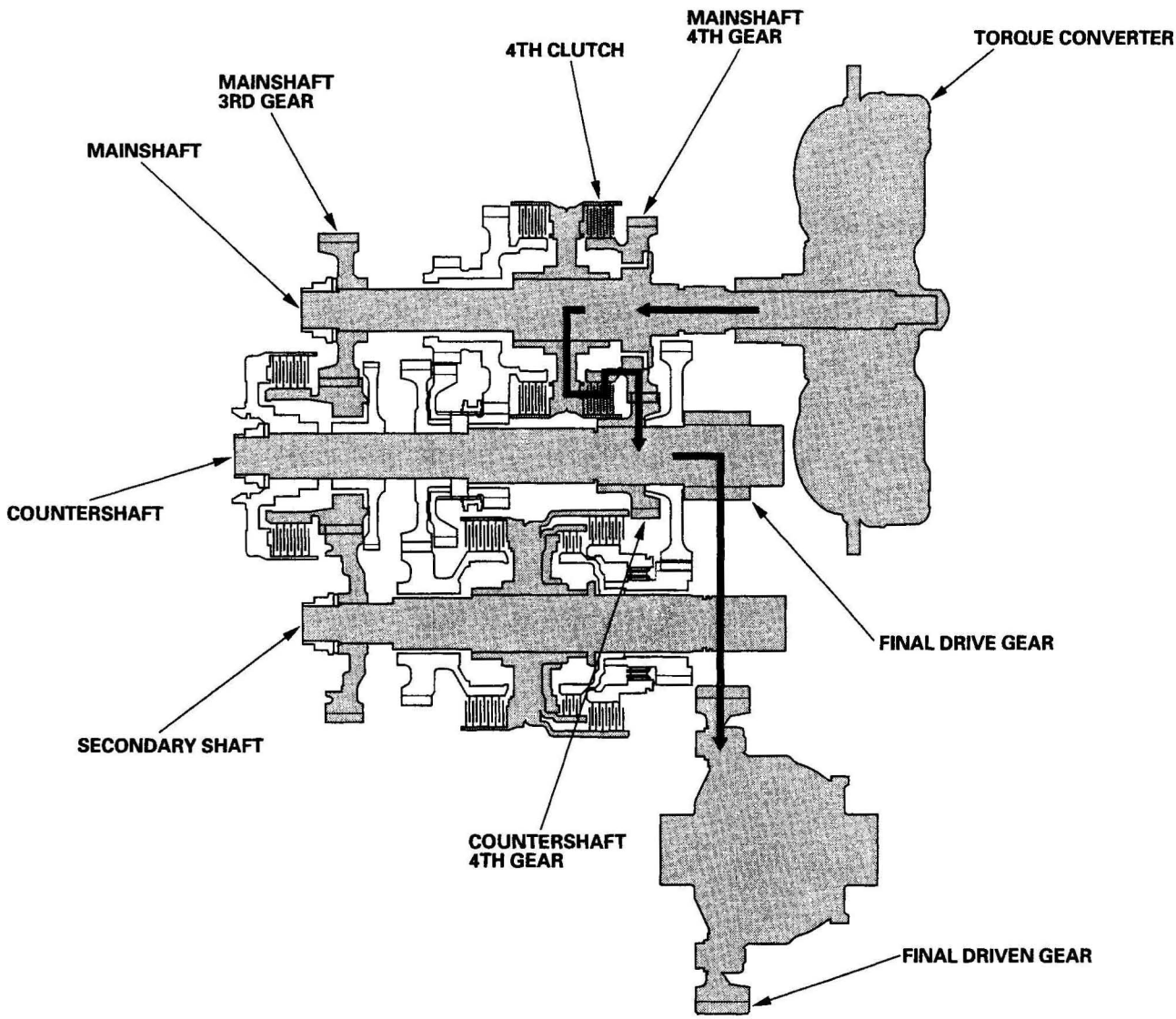
Protected by AR

System Description (cont'd)

Power Flow (cont'd)

D5, or D4 Position in 4th gear

- Hydraulic pressure is applied to the 4th clutch, then the 4th clutch engage the mainshaft 4th gear with the mainshaft.
- The mainshaft 4th gear drives the countershaft 4th gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 4th gear exceeds that of 1st gear, power from 1st gear cut off at the one-way clutch.

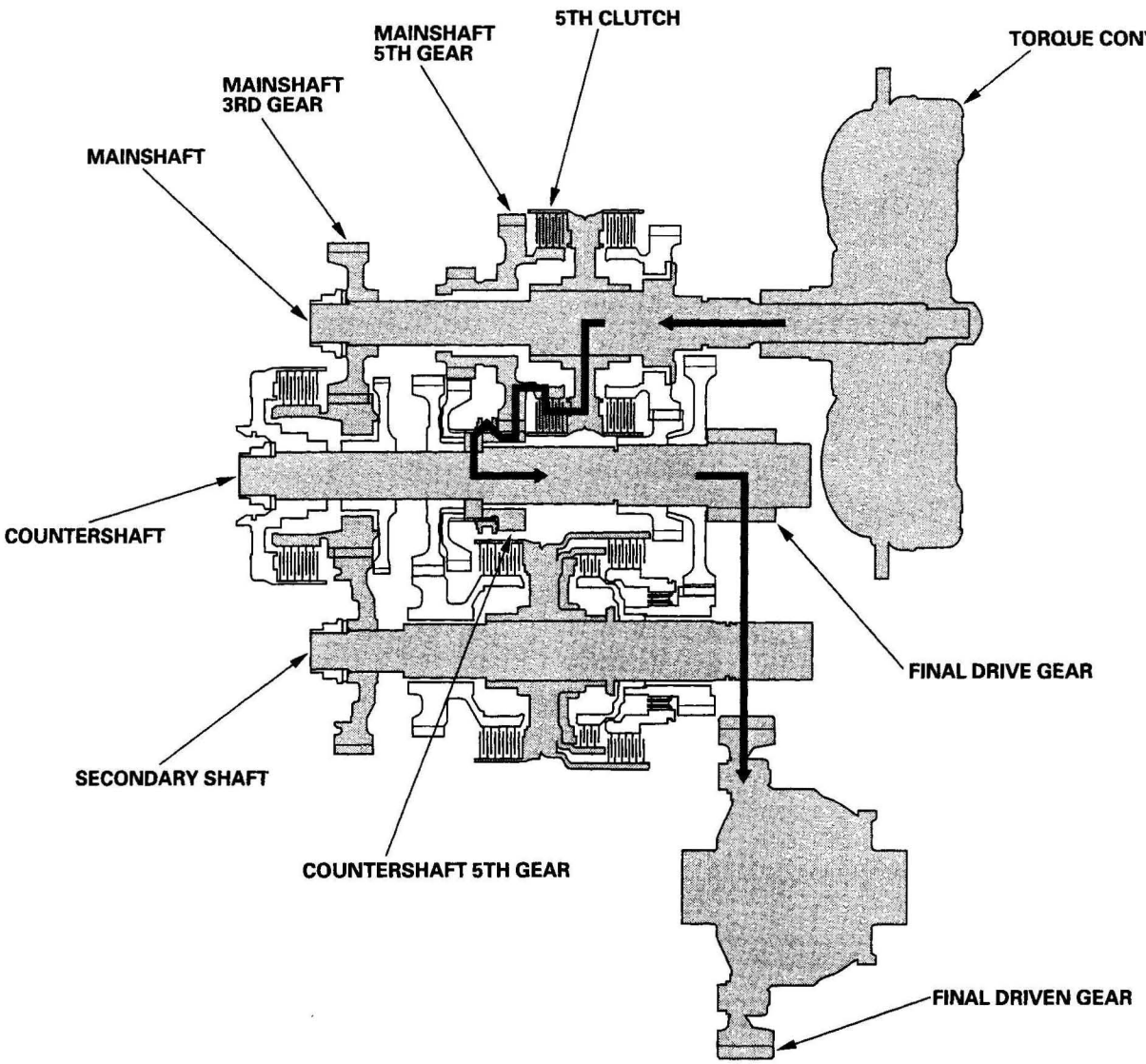


BACK

Protected by AR

Ⓓ5 Position in 5th gear

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft 5th gear while the shift lever is in the forward range (Ⓓ5, Ⓓ4, Ⓓ3, 2, and 1 position).
- Hydraulic pressure is also applied to the 5th clutch, then the 5th clutch engages the mainshaft 5th gear with the mainshaft.
- The mainshaft 5th gear drives the countershaft 5th gear, which drives the reverse selector hub and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.
- Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 5th gear exceeds that of 1st gear, power from 1st gear cut off at the one-way clutch.



(cont'd)

BACK

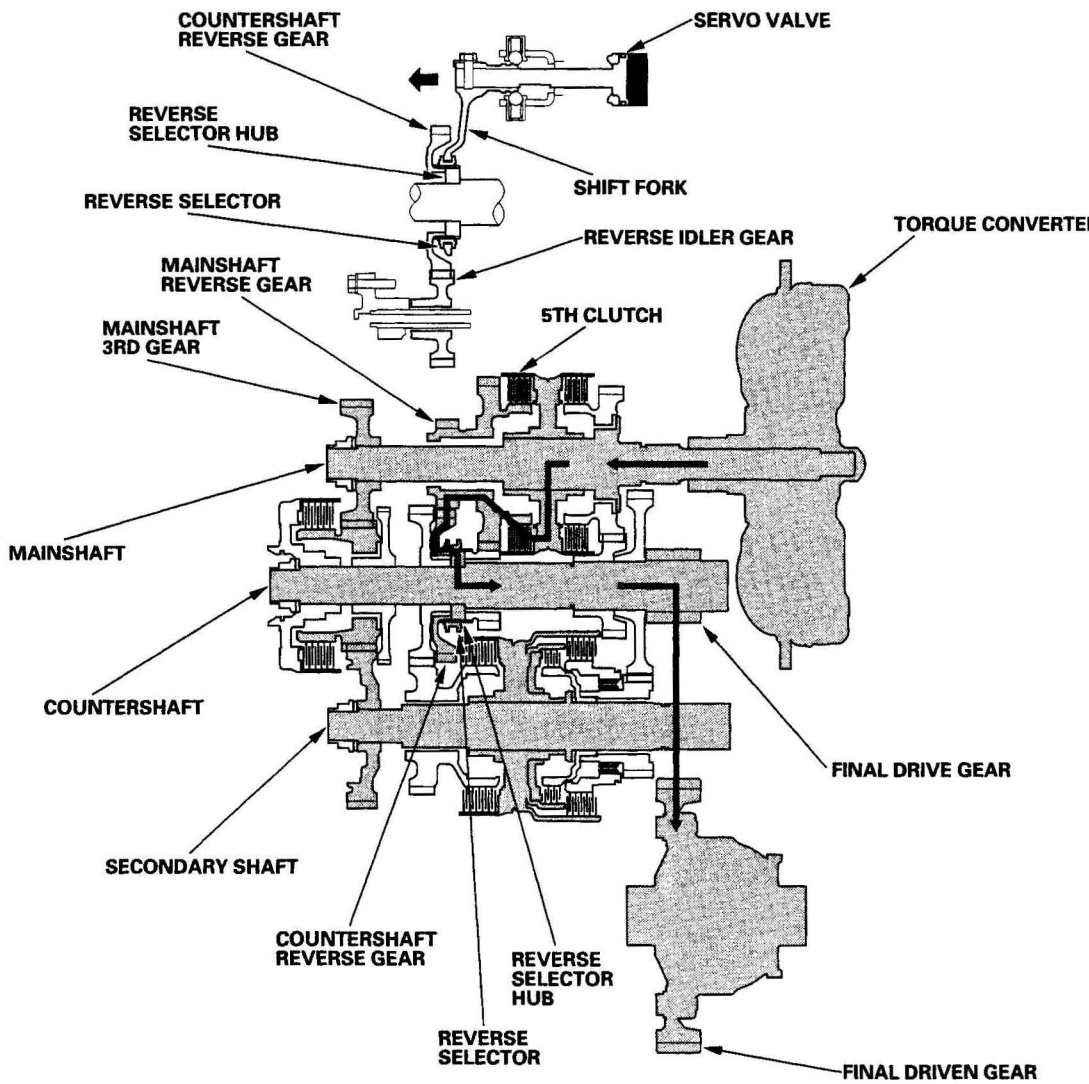
Protected by AR

System Description (cont'd)

Power Flow (cont'd)

[R] Position

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft (reverse gear while the shift lever is in the [R] position).
- Hydraulic pressure is also applied to the 5th clutch, then the 5th clutch engages the mainshaft reverse gear with the mainshaft.
- The mainshaft reverse gear drives the countershaft reverse gear via the reverse idler gear.
- The rotation direction of the countershaft reverse gear is changed via the reverse idler gear.
- The countershaft reverse gear drives the countershaft via the reverse selector which drives the reverse selector hub.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear.



BACK

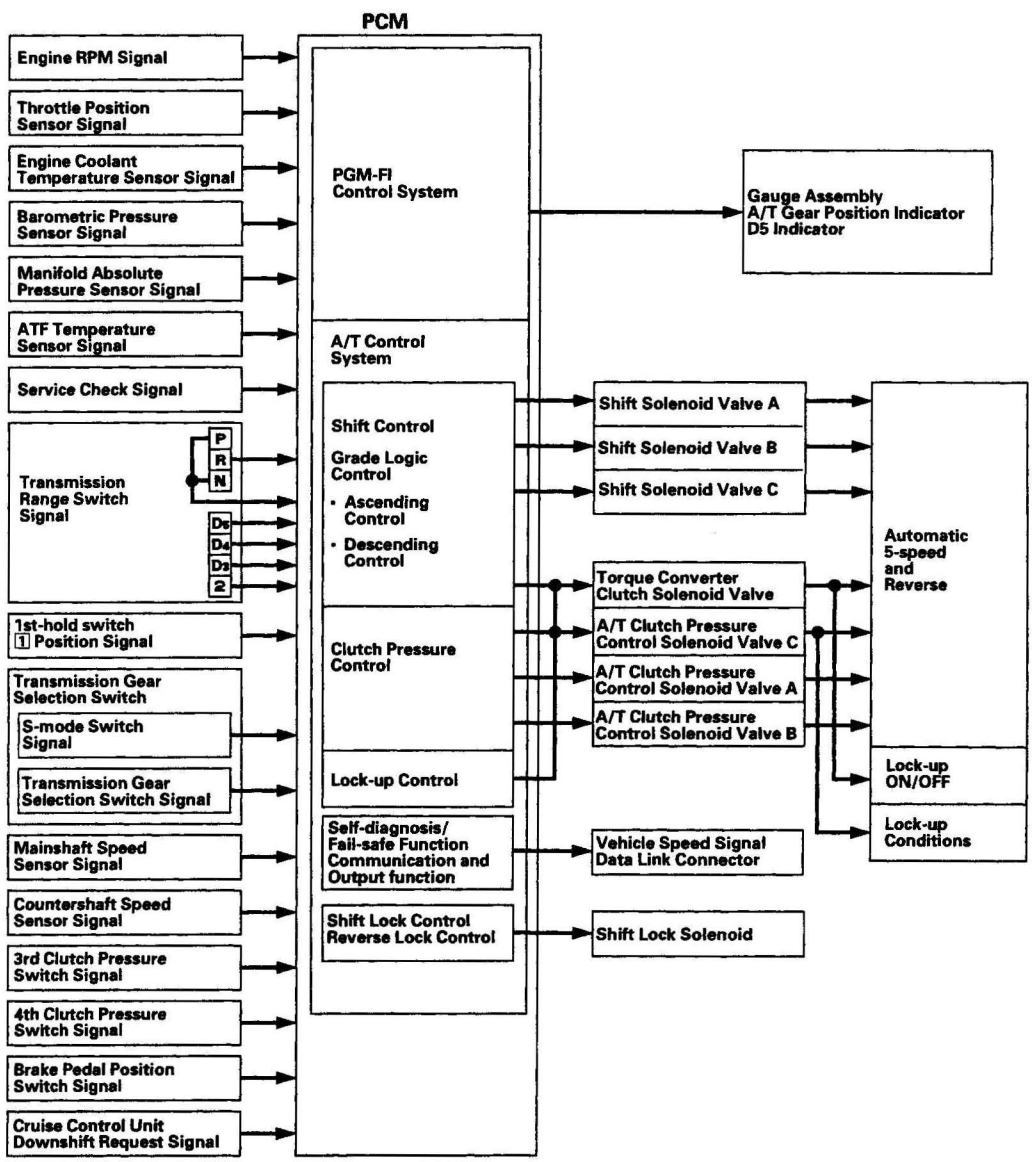
Protected by AR

Electronic Control System

Functional Diagram

The electronic control system consists of the Powertrain Control Model (PCM), sensors, and 7 solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The PCM receives input signals from the sensors, switches, switches, and other control units, perform processing data, and outputs signals for the engine control system and A/T control system. The A/T control system includes shift control, grade logic control, clutch pressure control, and lock-up control is stored in the PCM. The PCM switches the shift solenoid valves and the A/T clutch pressure control solenoid valves to control shifting transmission gears and lock-up torque converter clutch.



(cont'd)

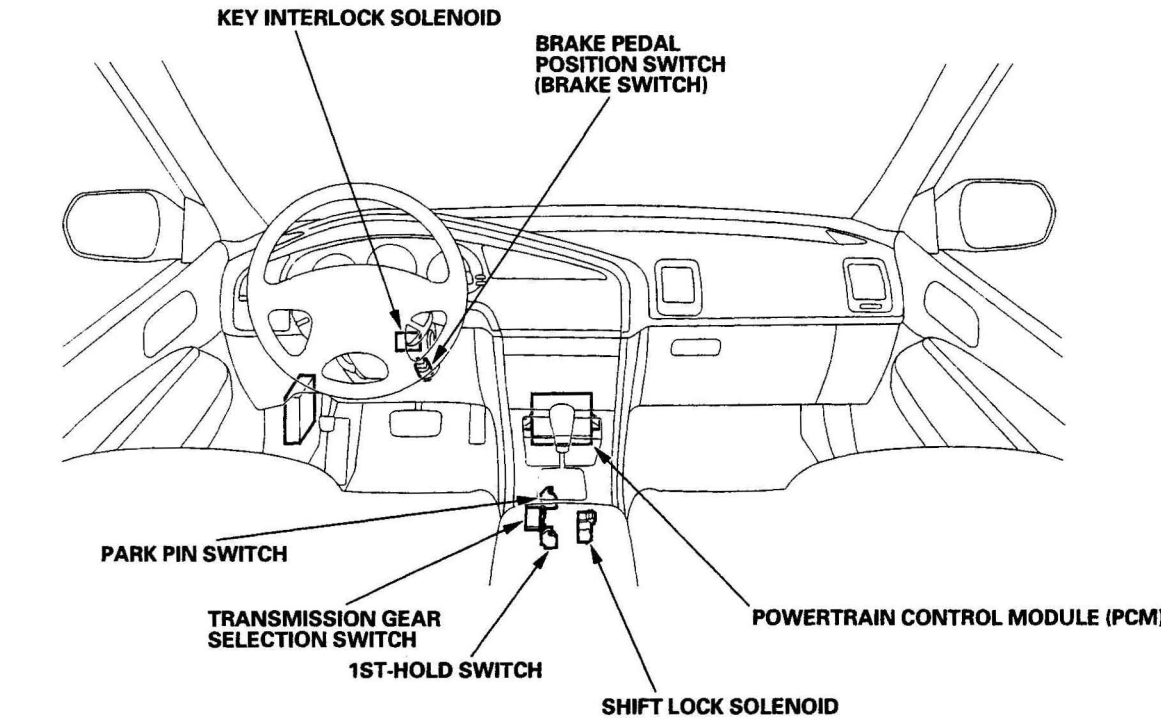
BACK

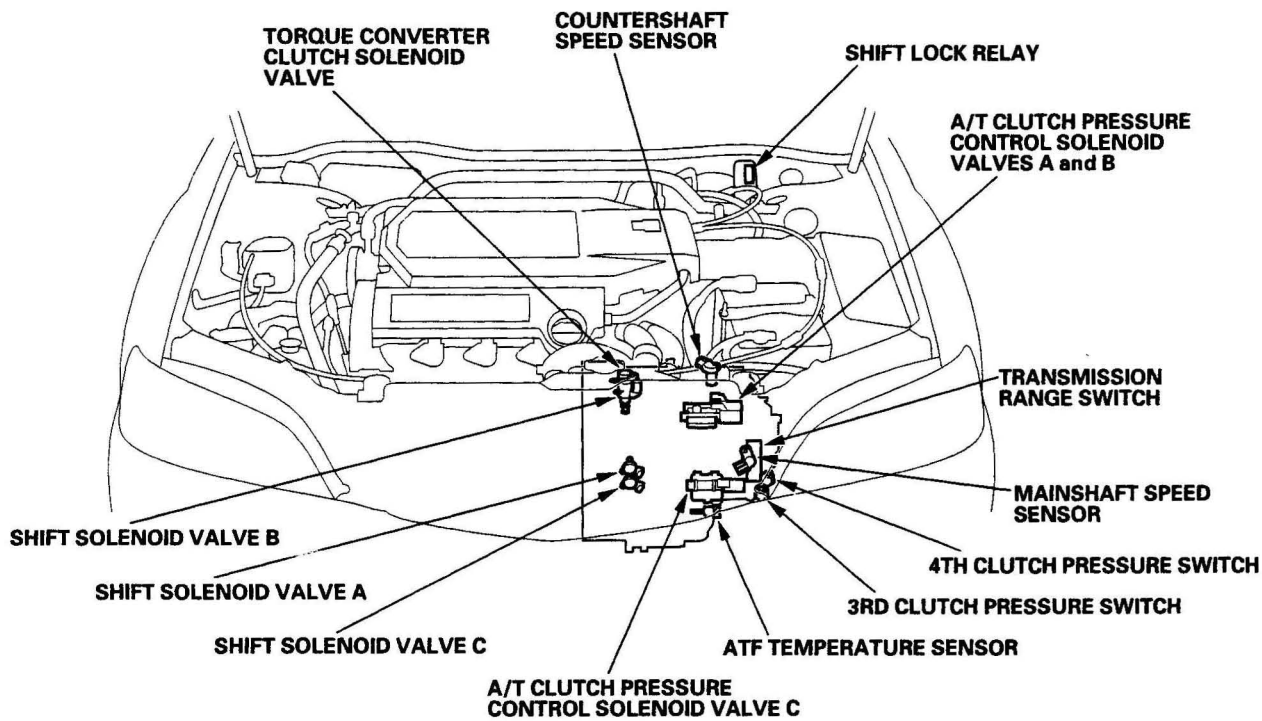
Protected by AR

System Description (cont'd)

Electronic Control System (cont'd)

Electronic Controls Location





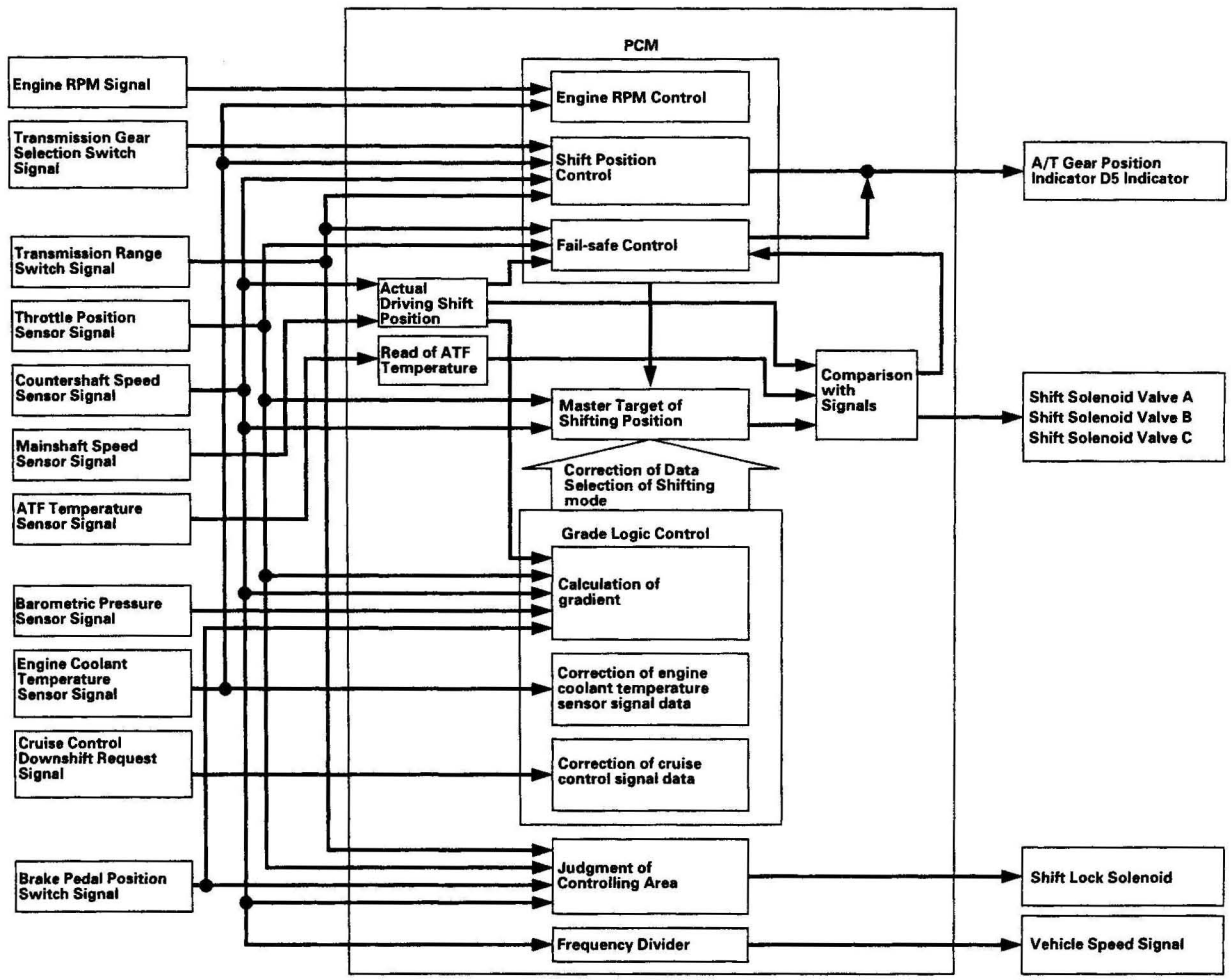
BACK

Protected by AR

Shift Control

The PCM instantly determines which gear should be selected by various signals sent from sensors and switches, and it actuates the shift solenoid valves A, B, and C to control shifting.

Also, as Grade Logic Control System has been adopted to control shifting in the D5, D4 and D3 positions. The PCM compares actual driving conditions with memorized driving conditions, based on the input from the throttle position sensor, the engine coolant temperature sensor, the barometric pressure sensor, the brake pedal position switch signal, and the shift lever position signal, to control shifting while the vehicle is ascending or descending a slope, or reducing speed.



(cont'd)

BACK

Protected by AR

System Description (cont'd)

Electronic Control System (cont'd)

The PCM turns on the shift solenoid valves A, B, and C to control shifting transmission gear.
The combination of driving signals to shift solenoid valves A, B, and C are shown in the table below.

Position	Gear position	Shift solenoid valves		
		A	B	C
D5, D4, D3	Shifting from the N position	OFF	ON	OFF
	Stays in 1st	ON	ON	ON
	Shifting gears between 1st and 2nd	ON	ON	ON
	Stays in 2nd	ON	ON	OFF
	Shifting gears between 2nd and 3rd	OFF	ON	OFF
	Stays in 3rd	OFF	ON	ON
D5, D4	Shifting gears between 3rd and 4th	OFF	OFF	ON
	Stays in 4th	OFF	OFF	OFF
D5	Shifting gears between 4th and 5th	ON	OFF	OFF
	Stays in 5th	ON	OFF	ON
2	2nd	ON	ON	OFF
1	1st	ON	ON	ON
R	Shifting from the P and N position	OFF	ON	ON
	Stays in reverse	OFF	ON	OFF
	Reverse inhibit	ON	ON	ON
P	Park	OFF	ON	OFF
N	Neutral	OFF	ON	OFF

NOTE: For a description of the reverse inhibit mode, refer to page 14-280.

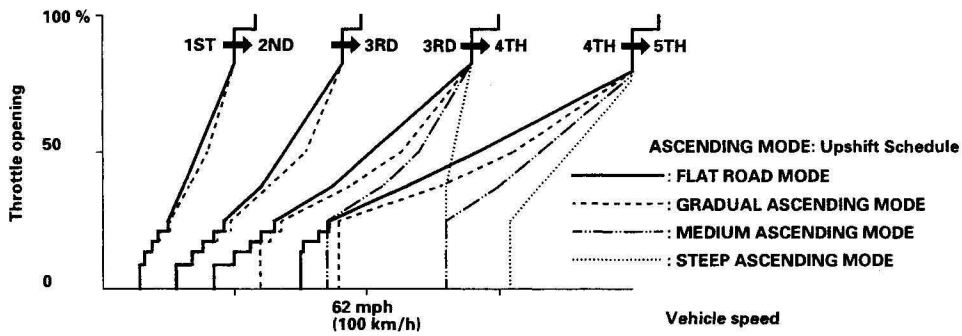
BACK

Protected by AR

Ascending Control

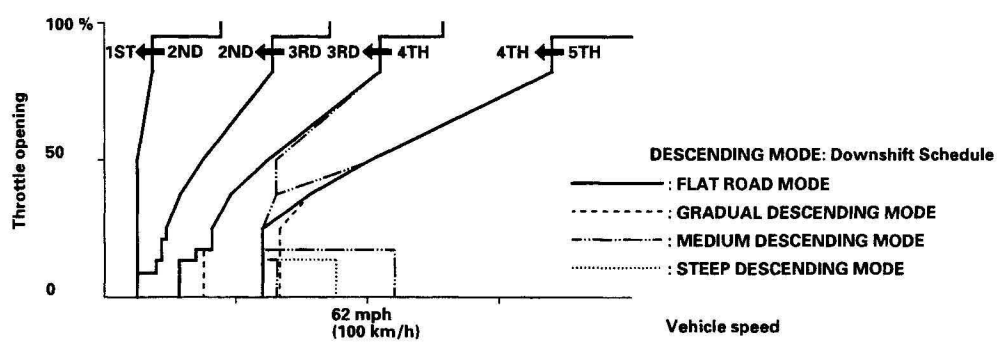
When the PCM determines that the vehicle is climbing a hill in D5, D4, and D3 positions and the sequential sportshift mode position, the system extends the engagement area of 2nd gear, 3rd gear, and 4th gear to prevent the transmission from frequently shifting between 2nd and 3rd gears, between 3rd and 4th gears, and between 4th and 5th gear, so the vehicle can run smooth and have more power when needed.

NOTE: Shift schedules stored in the PCM between 2nd and 3rd gears, between 3rd and 4th gears, and between 4th and 5th gear, enable to automatically select the most suitable gear according to the magnitude of a gradient.



Descending Control

When the PCM determines that the vehicle is going down a hill in D5, D4, and D3 positions and the sequential sportshift mode position, the shift-up speed from 4th to 5th gear, 3rd to 4th gear and from 2nd to 3rd (when the throttle is closed) becomes faster than the set speed for flat road driving to widen the 4th gear, 3rd gear and 2nd gear driving areas. This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are three descending modes with different 4th gear driving areas, 3rd gear driving areas and 2nd gear driving areas according to the magnitude of a gradient stored in the PCM. When the vehicle is in 5th gear or 4th gear, and you are decelerating when you are applying the brakes on a steep hill, the transmission will downshift to lower gear. When you accelerate, the transmission will then return to higher gear.



Deceleration Control

When the vehicle goes around a corner, and needs to decelerate first and then accelerate, the PCM sets the data for deceleration control to reduce the number of times the transmission shifts. When the vehicle is decelerating from speeds above 27 mph (43 km/h), the PCM shifts the transmission from 5th or 4th to 2nd earlier than normal to cope with upcoming acceleration.

(cont'd)

Protected by AR

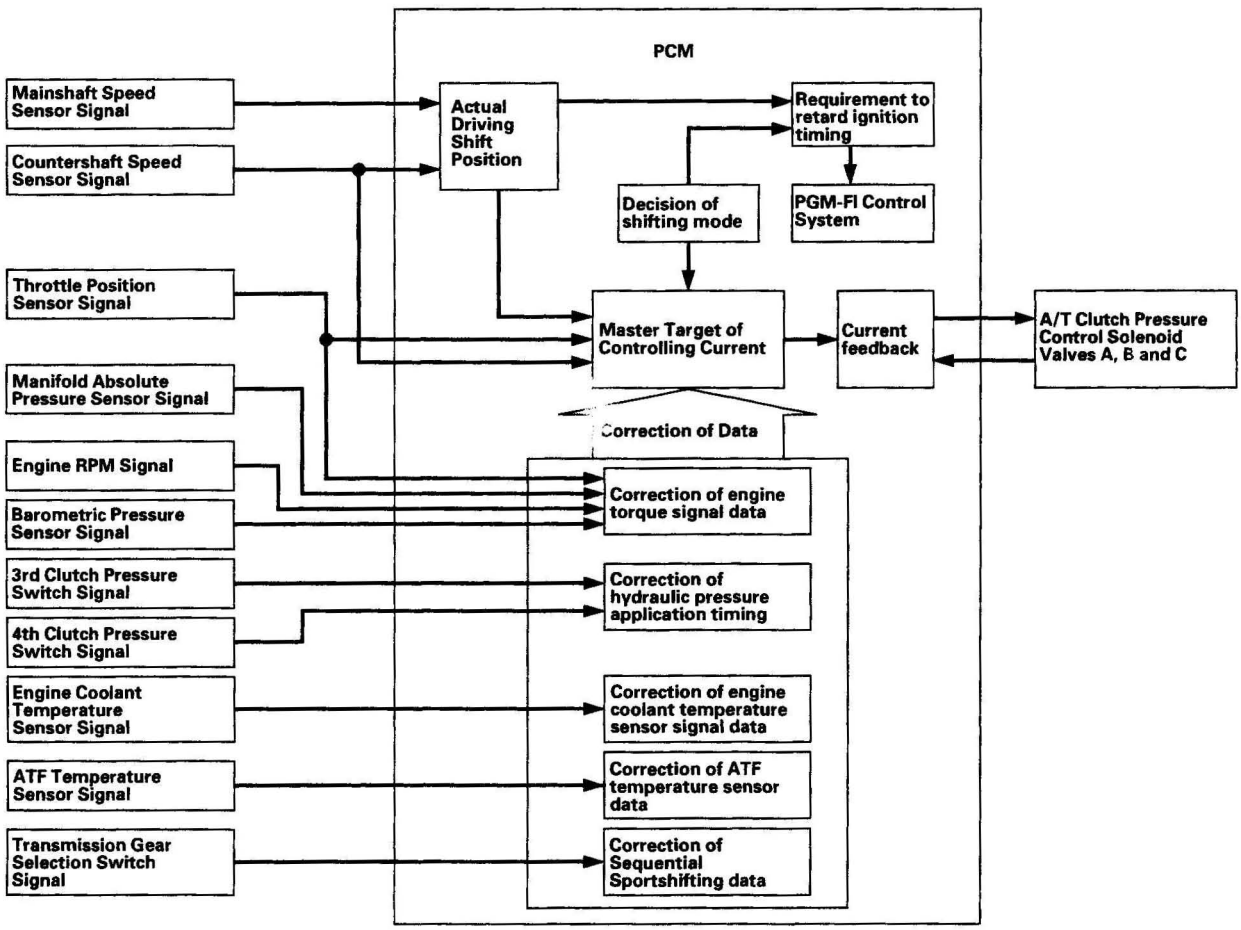
System Description (cont'd)

Electronic Control System (cont'd)

Clutch Pressure Control

The PCM actuates the A/T clutch pressure control solenoid valves A, B, and C to control the clutch pressure. When shifting between lower and higher gears, the clutch pressure regulated by the A/T clutch pressure control solenoid valves A, B, and C engages and disengages the clutch smoothly.

The PCM receives input signals from the various sensors and switches, performs processing data, and outputs a current to the A/T clutch pressure control solenoid valves A, B, and C.



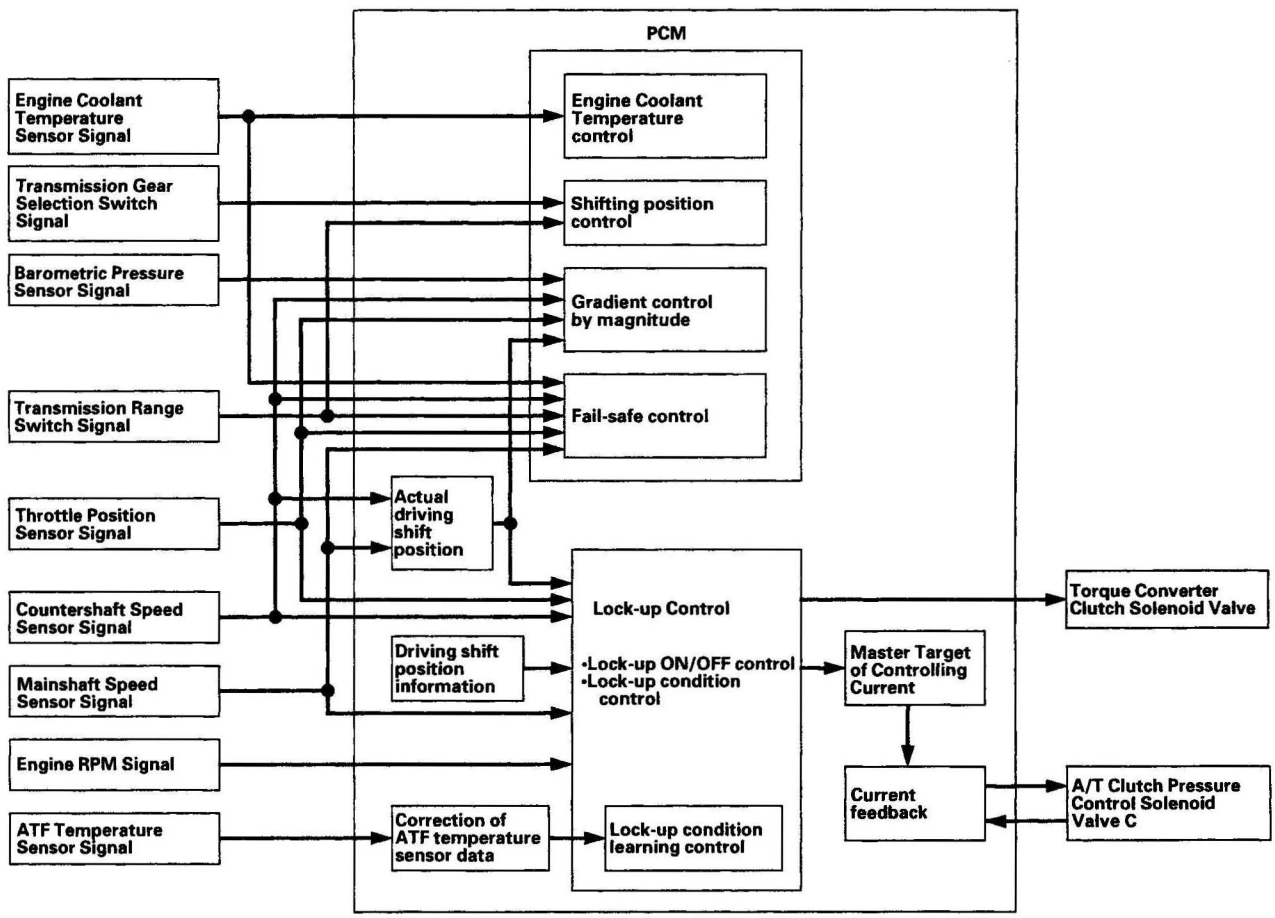
BACK

Protected by AR

Lock-up Control

The torque converter clutch solenoid valve controls the hydraulic pressure to switch the lock-up shift valve and lock-up ON and OFF. The PCM actuates the torque converter clutch solenoid valve and the A/T clutch pressure control solenoid valve ON, the condition of the lock-up starts. The A/T clutch pressure control solenoid valve C regulates and apply the hydraulic pressure to the lock-up control valve to control the amount of the lock-up.

The lock-up mechanism operates in the D5 position (3rd, 4th, and 5th), in the D4 position (3rd, and 4th), and in the D3 position (3rd).



(cont'd)

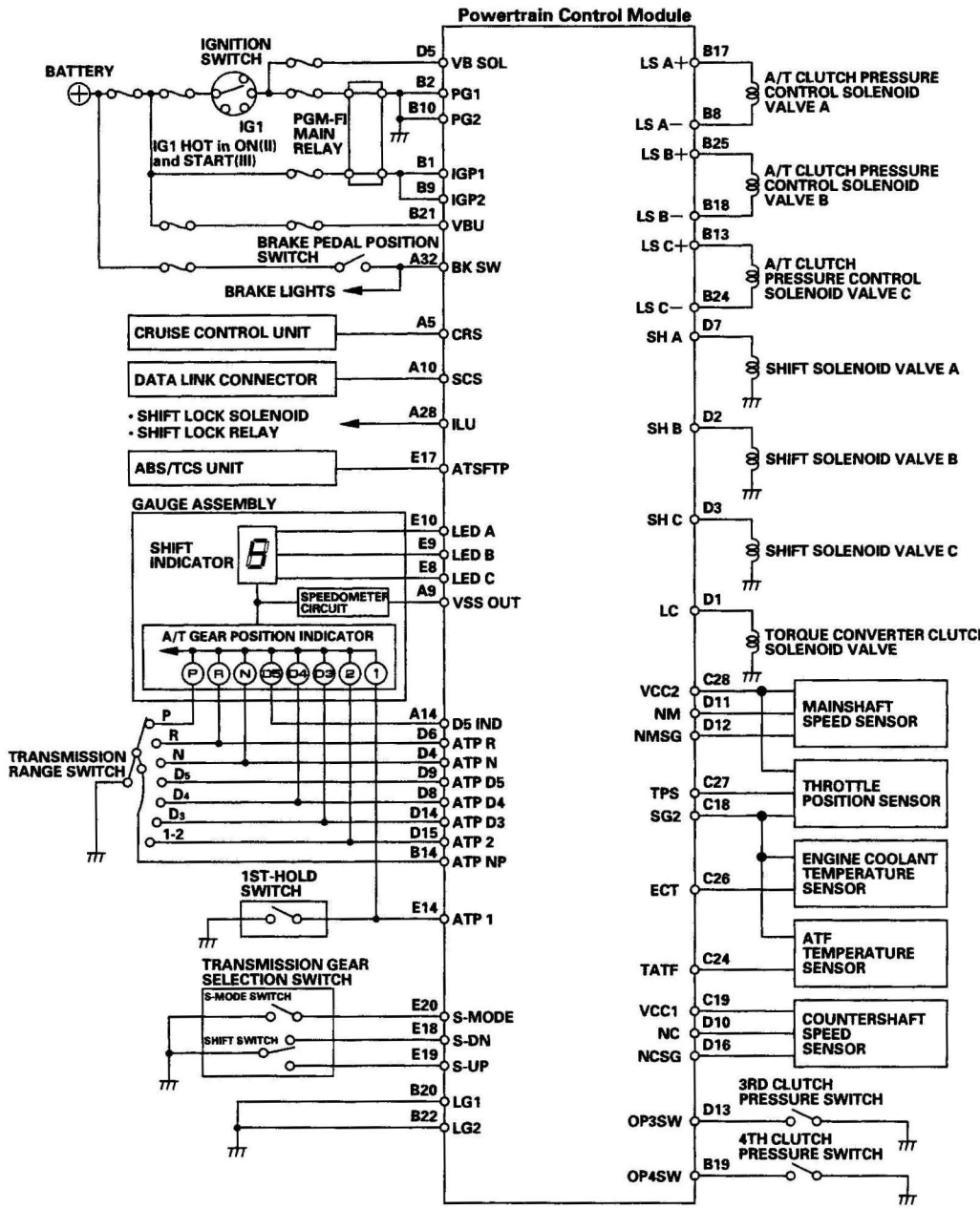
BACK

Protected by AR

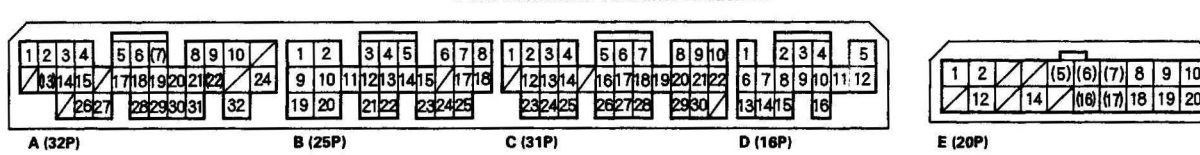
System Description (cont'd)

Electronic Control System (cont'd)

PCM Electrical Connections



PCM Connector Terminal Locations



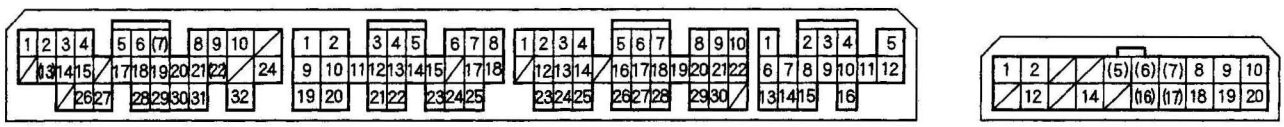
BACK

Protected by AR

PCM Inputs and Outputs

The PCM terminal voltage and measuring conditions for the A/T control system are shown. Other PCM terminal voltage and measuring conditions are described in section 11.

PCM Connector Terminal Locations



PCM CONNECTOR A (32P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
A5	BLU/GRN	CRS	Downshift signal input from cruise control unit	When cruise control is used: About 1 V
A9	BLU/WHT	VSS OUT	Vehicle speed signal detected from countershaft speed sensor, and sent to speedometer and odometer	Depending on vehicle speed: Pulsing signal
A10	BRN	SCS	Timing and adjustment service check signal	With ignition switch ON (II) and data link connector open: 5 V With ignition switch ON (II) and data link connector connected with Honda PGM tester: 0 V
A14	GRN/BLK	D5 IND	D5 indicator control	When ignition switch is first turned ON (II): About 7 V for 2 seconds In the D5 position: About 7 V
A28	WHT/RED	ILU	Interlock control	With ignition switch ON (II), brake pedal pressed, and accelerator pedal released: Battery voltage
A32	WHT/BLK	BK SW	Brake pedal position switch signal input	Brake pedal pressed: Battery voltage Brake pedal released: 0 V

(cont'd)

BACK

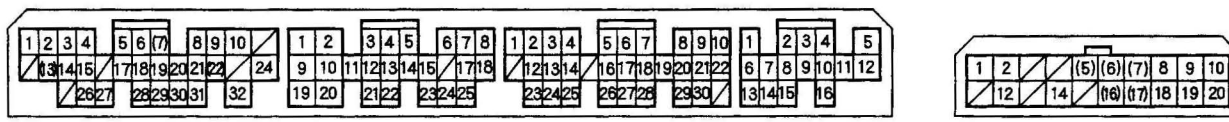
Protected by AR

System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs

PCM Connector Terminal Locations



PCM CONNECTOR B (25P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
B1	YEL/BLK	IGP1	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B2	BLK	PG1	Ground	All conditions: Less than 3 V
B8	WHT	LS A−	A/T clutch pressure control solenoid valve A power supply negative electrode	
B9	YEL/BLK	IGP2	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B10	BLK	PG2	Ground	All conditions: Less than 3 V
B13	GRN/RED	LS C+	A/T clutch pressure control solenoid valve C power supply positive electrode	With ignition switch ON (II): Pulsing signal
B14	BLU/WHT	ATP NP	Transmission range switch [P] and [N] positions input	In the [P] and [N] positions: 0 V In other than the [P] and [N] position: Battery voltage
B17	RED	LS A+	A/T clutch pressure control solenoid valve A power supply positive electrode	With ignition switch ON (II): Pulsing signal
B18	GRN	LS B−	A/T clutch pressure control solenoid valve B power supply negative electrode	
B19	BLU/YEL	AT OP4SW	A/T 4th clutch pressure switch signal input	With ignition switch ON (II): Battery voltage (No 4th clutch pressure) With 4th clutch pressure: About 0 V
B20	BRN/YEL	LG1	Ground	All conditions: Less than 3 V
B21	WHT/RED	VBU	Back-up power supply	Always battery voltage
B22	BRN/YEL	LG2	Ground	All conditions: Less than 3 V
B24	RED/BLU	LS C−	A/T clutch pressure control solenoid valve C power supply negative electrode	
B25	BRN/WHT	LS B+	A/T clutch pressure control solenoid valve B power supply positive electrode	With ignition switch ON (II): Pulsing signal

BACK

Protected by AR

PCM CONNECTOR C (31P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
C18	GRN/YEL	SG2	Sensor ground	All conditions: Less than 3 V
C19	YEL/RED	VCC1	Power supply for sensors	With ignition switch ON (II): 5 V With ignition switch OFF: 0 V
C24	BLU/YEL	TATF	ATF temperature sensor signal input	With ignition switch ON (II): About 5 V With ignition switch OFF: 0 V
C28	YEL/BLU	VCC2	Power supply for sensors	With ignition switch ON (II): 5 V With ignition switch OFF: 0 V

PCM CONNECTOR D (16P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
D1	YEL	LC	Torque converter clutch solenoid valve control	During lock-up condition: Battery voltage During no lock-up condition: 0 V
D2	GRN/WHT	SH B	Shift solenoid valve B control	Battery voltage in these positions: • 1, 2 • D5, D4, and D3 in 1st , 2nd and 3rd gear • P, R, and N 0 V in these positions: • D5, and D4 in 4th gear • D5 in 5th gear
D3	GRN	SH C	Shift solenoid valve C control	Battery voltage in these positions: • 1 • D5, D4, and D3 in 1st, 3rd and 5th gear 0 V in these positions: • 2 • D5, D4, and D3 in 2nd gear • D5, and D4 in 4th gear • P, R, and N
D4	RED/BLK	ATP N	Transmission range switch N position input	In N position: 0 V In other than N position: Battery voltage
D5	BLK/YEL	VB SOL	Power supply for solenoid valves (Fuse No. 6 in driver's under-dash fuse/relay box)	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
D6	WHT	ATP R	Transmission range switch R position input	In R position: 0 V In other than R position: Battery voltage
D7	BLU/YEL	SH A	Shift solenoid valve A control	Battery voltage in these positions: • 1, 2 • D5, D4, and D3 in 1st and 2nd gear • D5 in 5th gear 0 V in these positions: • D5, D4, and D3 in 3rd gear • D5, and D4 in 4th gear • P, R, and N
D8	YEL	ATP D4	Transmission range switch D4 position input	In the D4 position: 0 V In other than the D4 position: Battery voltage
D9	YEL/GRN	ATP D5	Transmission range switch D5 position input	In the D5 position: 0 V In other than the D5 position: Battery voltage
D10	BLU	NC	Countershaft speed sensor input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: About 0 V
D11	RED	NM	Mainshaft speed sensor input	Depending on vehicle speed: Pulsing signal When engine is stopped: About 0 V

(cont'd)

BACK

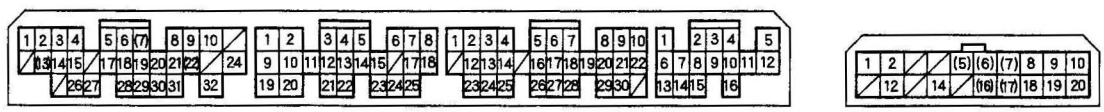
Protected by AR

System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs

PCM Connector Terminal Locations



A (32P) B (25P) C (31P) D (16P) E (20P)

PCM CONNECTOR D (16P)

Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
D12	WHT	NMSG	Mainshaft speed sensor ground	
D13	BLU/WHT	ATOP3SW	A/T 3rd clutch pressure switch signal input	With ignition switch ON (II): Battery voltage (No 3rd clutch pressure) With 3rd clutch pressure: About 0 V
D14	RED	ATP D3	Transmission range switch D3 position input	In the D3 position: 0 V In other than the D3 position: Battery voltage
D15	BLU	ATP 2	Transmission range switch 2 position input	In the 2 position: 0 V In other than the 2 position: Battery voltage
D16	GRN	NCSG	Countershaft speed sensor ground	

PCM CONNECTOR E (20P)

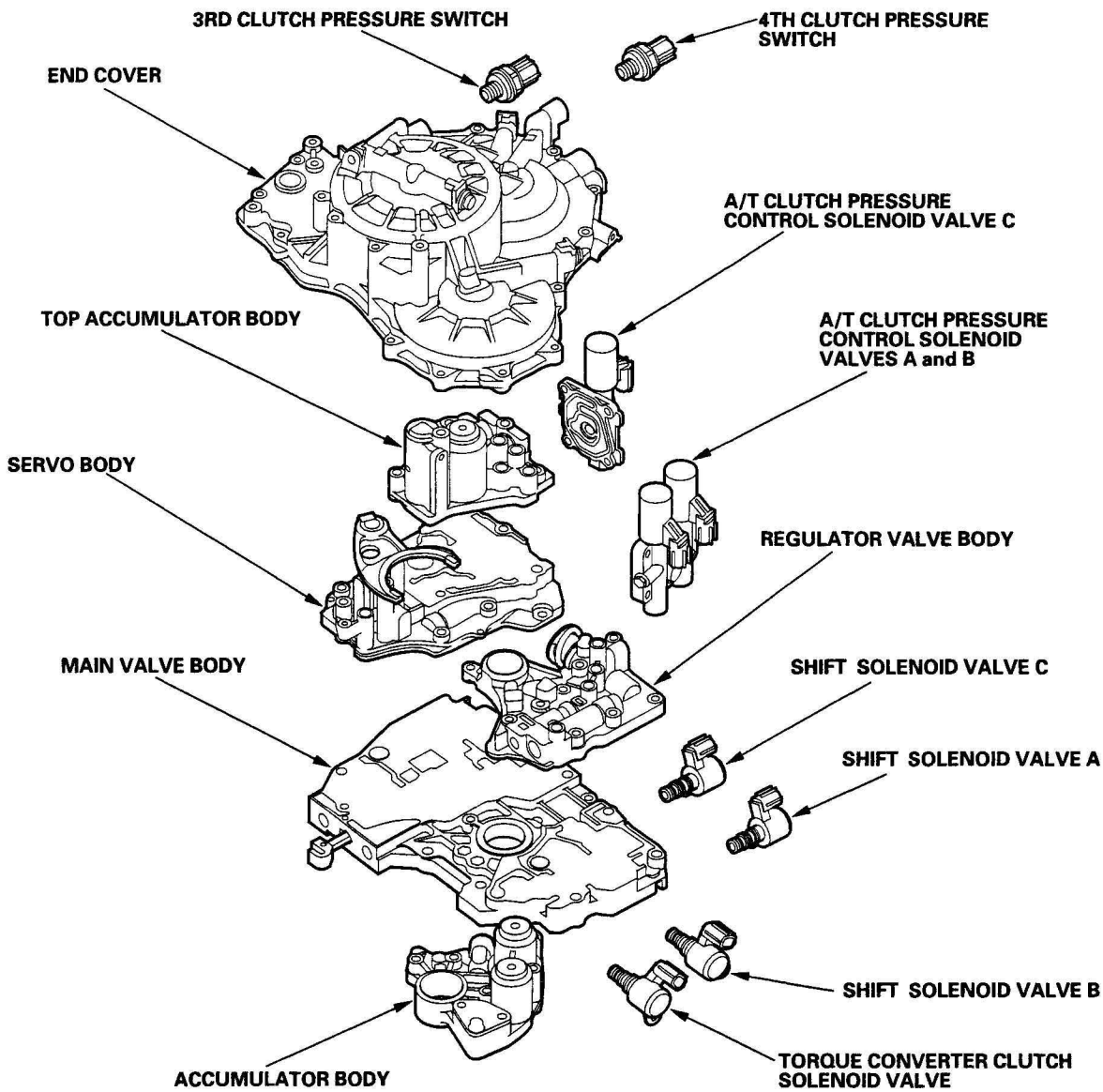
Terminal Number	Wire	Signal	Description	Measuring Conditions/Terminal Voltage
E8	BLU/BLK	LED C	Shift indicator control	In sequential sportshift mode: • 1st, 3rd, and 5th gear positions: Battery voltage • 2nd and 4th gear positions: 0 V
E9	BLU/GRN	LED B	Shift indicator control	In sequential sportshift mode: • 2nd and 3rd gear positions: Battery voltage • 1st, 4th, and 5th gear positions: 0 V
E10	BLU/RED	LED A	Shift indicator control	In sequential sportshift mode: • 4th and 5th gear positions: Battery voltage • 1st, 2nd, and 3rd gear positions: 0 V
E14	BRN	ATP 1	1st-hold switch 1 position input	In the 1 position: 0 V In other than the 1 position: Battery voltage
E18	ORN	S-DN	Downshift switch signal input	In sequential sportshift mode and shift lever pushed toward downshift position (marked with "−"): 0 V In sequential sportshift mode and shift lever in neutral position: 5 V
E19	YEL	S-UP	Upshift switch signal input	In sequential sportshift mode and shift lever pushed toward upshift position (marked with "+"): 0 V In sequential sportshift mode and shift lever in neutral position: 5 V
E20	RED	S-MODE	Sequential sportshift transmission gear selection switch signal input	In sequential sportshift mode (shift lever is positioned in sequential sportshift mode): 0 V In other than sequential sportshift mode: 5 V

BACK

Protected by AR

Hydraulic Controls

The valve body includes the main valve body, the regulator valve body, the servo body and the accumulator body. The ATF pump is driven by splines on the left end of the torque converter which is attached to the engine. Fluid flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, directing pressure to each of the clutches. The shift solenoid valves B and C are mounted on the outside of the torque converter housing. The shift solenoid valve A and the torque converter clutch solenoid valve are mounted on the torque converter housing. The A/T clutch pressure control solenoid valves A, B, and C are mounted on the transmission housing.



(cont'd)

BACK

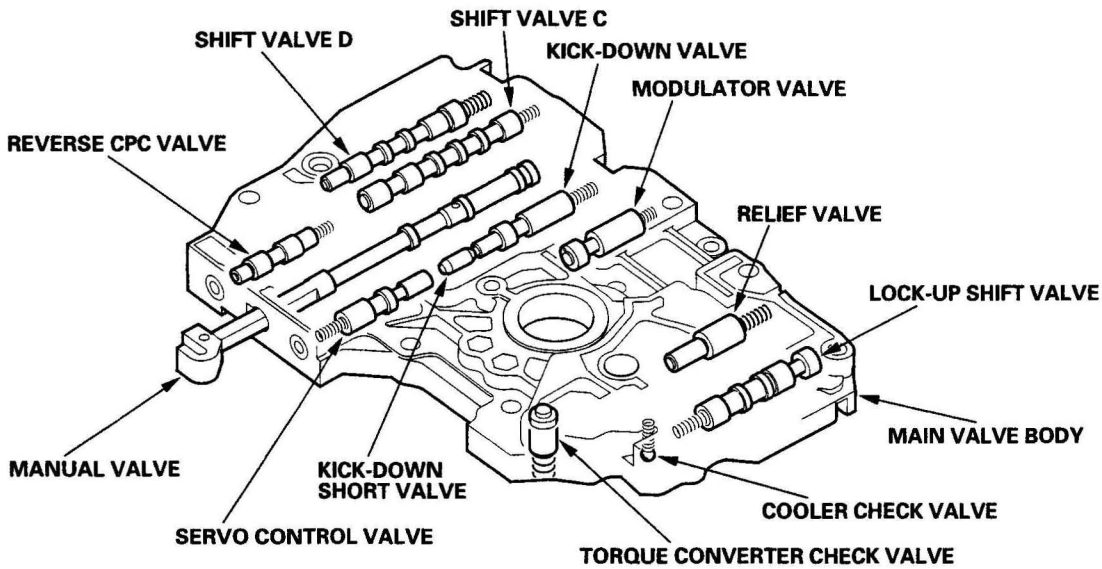
Protected by AR

System Description (cont'd)

Hydraulic Controls (cont'd)

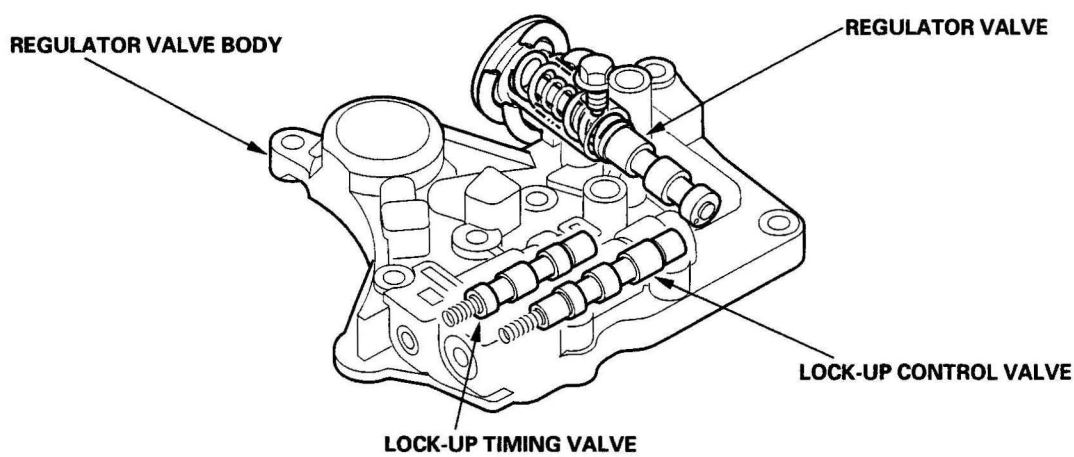
Main Valve Body

The main valve body contains the manual valve, the modulator valve, the shift valve C, the shift valve D, the servo control valve, the cooler check valve, the torque converter check valve, the reverse CPC valve, the lock-up shift valve, the relief valve, the kick-down valve, the kick-down short valve, and the ATF pump gears. The primary function of the main valve body is to switch fluid pressure on and off and to control hydraulic pressure going to the hydraulic control system.



Regulator Valve Body

The regulator valve body is located on the main valve body. The regulator valve body contains the regulator valve, the lock-up timing valve, and the lock-up control valve.



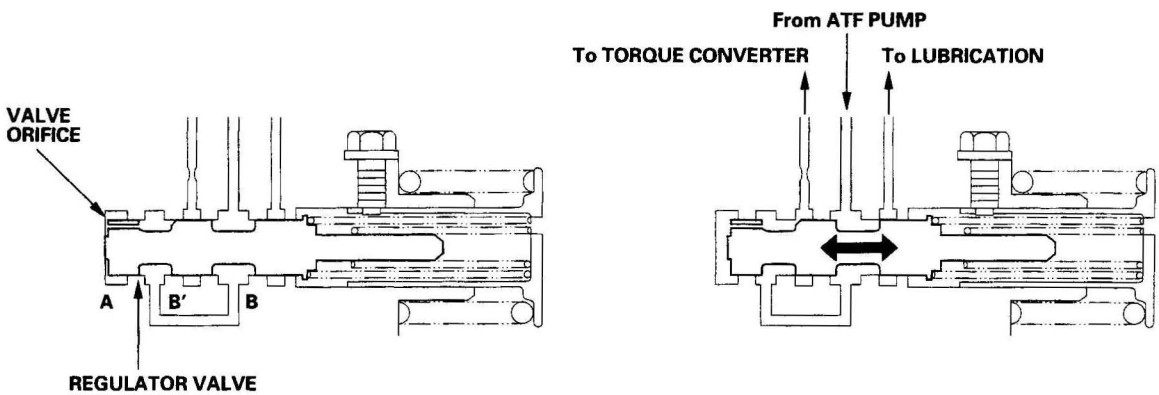
BACK

Protected by AR

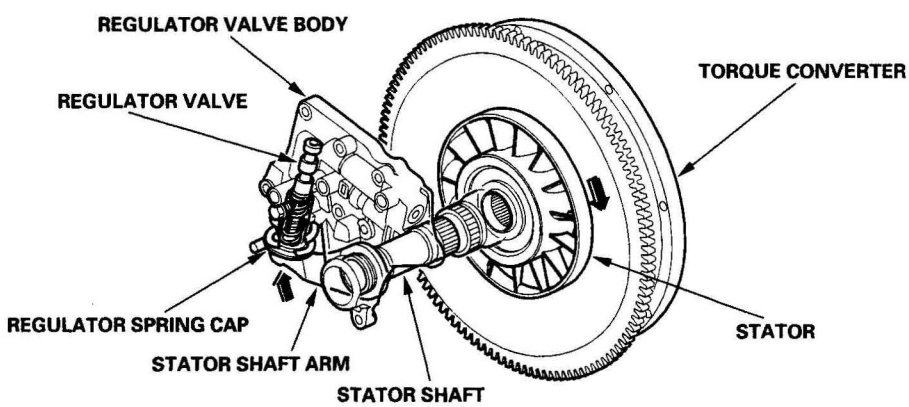
Regulator Valve

The regulator valve maintains constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubricating system and torque converter. Fluid from the ATF pump flows through B and B'. Fluid entering from B flows through the valve orifice to the A cavity. This pressure of the A cavity pushes the regulator valve to the right side, and this movement of the regulator valve uncovers the fluid port to the torque converter and the relief valve. The fluid flows out to the torque converter and the relief valve, and the regulator valve moves to the left side. According to the level of the hydraulic pressure through B, the position of the regulator valve changes, and the amount of fluid from B' through torque converter changes. This operation is continued, maintaining the line pressure.

NOTE: When used, "left" or "right" indicates direction on the illustration below.



Increases in hydraulic pressure according to torque are performed by the regulator valve using stator torque reaction. The stator shaft is splined to the stator in the torque converter, and its arm end contacts the regulator spring cap. When the vehicle is accelerating or climbing (torque converter range), stator torque reaction acts on the stator shaft, and the stator arm pushes the regulator spring cap in the direction of the arrow in proportion to the reaction. The stator reaction spring compresses, and the regulator valve moves to increase the line pressure which is regulated by the regulator valve. The line pressure reaches its maximum when the stator torque reaction reaches its maximum.



(cont'd)

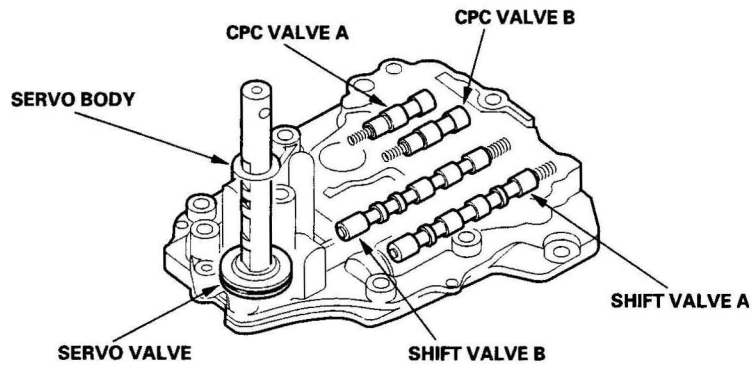
BACK

Protected by AR

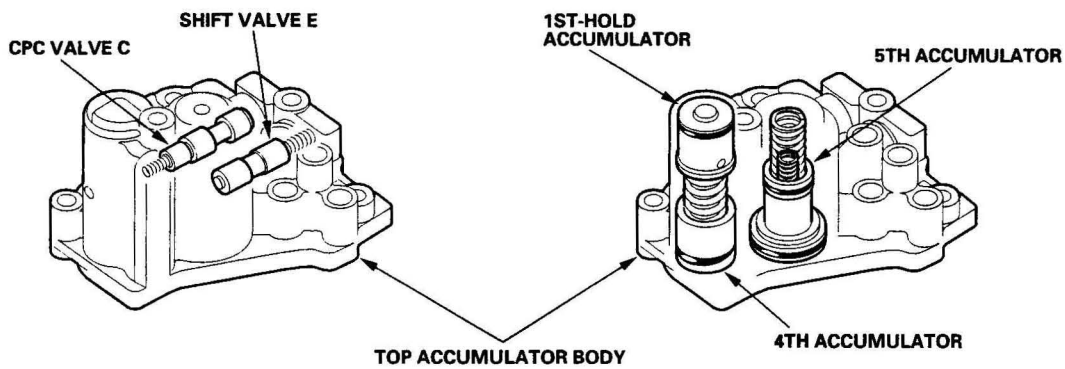
System Description (cont'd)

Hydraulic Controls (cont'd)

Servo Body
The servo body is on the main valve body. It contains the servo valve, the shift valve A, the shift valve B, and CPC valves A and B.

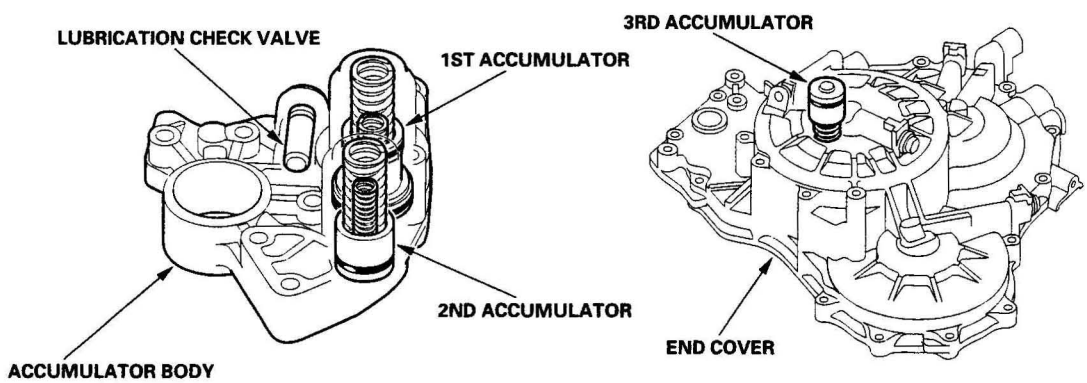


Top Accumulator Body
The top accumulator body contains shift valve E, CPC valve C, 4th/1st-hold accumulator, and 5th accumulator.



Accumulator Body
The accumulator body is on the torque converter housing, next to the main valve body. It contains the 1st and the 2nd accumulators and the lubrication check valve.

3rd Accumulator
The 3rd accumulator is in the end cover.



BACK

Protected by AR

Hydraulic Flow

Distribution of Hydraulic Pressure

As the engine turns, the ATF pump starts to operate. Automatic transmission fluid (ATF) is drawn through the ATF strainer (filter) and discharged into the hydraulic circuit. Then, ATF flowing from the ATF pump becomes line pressure that's regulated by the regulator valve. Torque converter pressure from the regulator valve enters the torque converter through the lock-up shift valve and it is discharged from the torque converter. The torque converter check valve prevents torque converter pressure from rising.

The PCM turns the shift solenoid valves ON and OFF, and the shift solenoid valves control shift solenoid pressure to the shift valves. Applying shift solenoid pressure to the shift valves moves the position of the shift valve, and switches the port of hydraulic pressure. The PCM also controls A/T clutch pressure control solenoid valves A and B. The A/T clutch pressure control solenoid valves regulate the A/T clutch pressure control solenoid pressure and apply the A/T clutch pressure control solenoid pressure to CPC valves A and B.

When shifting gears, the clutch is engaged by pressure from the CPC pressure mode. The PCM controls one of the shift solenoid valves to move the position of the shift valve. This movement switches the port of the CPC and line pressure. Line pressure is then applied to the clutch, and the CPC pressure is intercepted. Engaging the clutch with line pressure happens when shifting is completed.

Hydraulic pressure at the ports is as follows:

PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE
1	LINE	5N	CPC A or LINE	56	LS A
2	LINE	5D	CPC B or LINE	57	LS B
3	LINE	5G	CPC B or LINE	58	LS C
3'	LINE	5K	CPC B or LINE	90	TORQUE CONVERTER
3''	LINE	6	MODULATE	90'	TORQUE CONVERTER
4	LINE	SA	SH A	91	TORQUE CONVERTER
4'	LINE	SB	SH B	91'	TORQUE CONVERTER
4''	LINE	SC	SH C	92	TORQUE CONVERTER
4A	CPC A	LA	LC A	93	ATF COOLER
4B	CPC B	9	LINE	94	TORQUE CONVERTER
4C	CPC C	10	1ST CLUTCH	95	LUBRICATION
5B	CPC A	15	1ST-HOLD CLUTCH	95'	LUBRICATION
5C	CPC B	20	2ND CLUTCH	96	TORQUE CONVERTER
5H	CPC B	25	LINE	99	SUCTION
5J	CPC B	30	3RD CLUTCH	X	DRAIN
5A	CPC A or LINE	40	4TH CLUTCH	HX	HIGH POSITION DRAIN
5E	CPC A or LINE	50	5TH CLUTCH	AX	AIR DRAIN
5F	CPC A or LINE	51	5TH CLUTCH		
5M	CPC A or LINE	55	CPC C or LINE		

NOTE:

- CPC: Clutch Pressure Control pressure
- SH: Shift Solenoid pressure
- LS A: A/T Clutch Pressure Control Solenoid A pressure
- LS B: A/T Clutch Pressure Control Solenoid B pressure
- LS C: A/T Clutch Pressure Control Solenoid C pressure
- LC: Lock-up Control Solenoid pressure

(cont'd)

BACK

Protected by AR

System Description (cont'd)

Hydraulic Flow (cont'd)

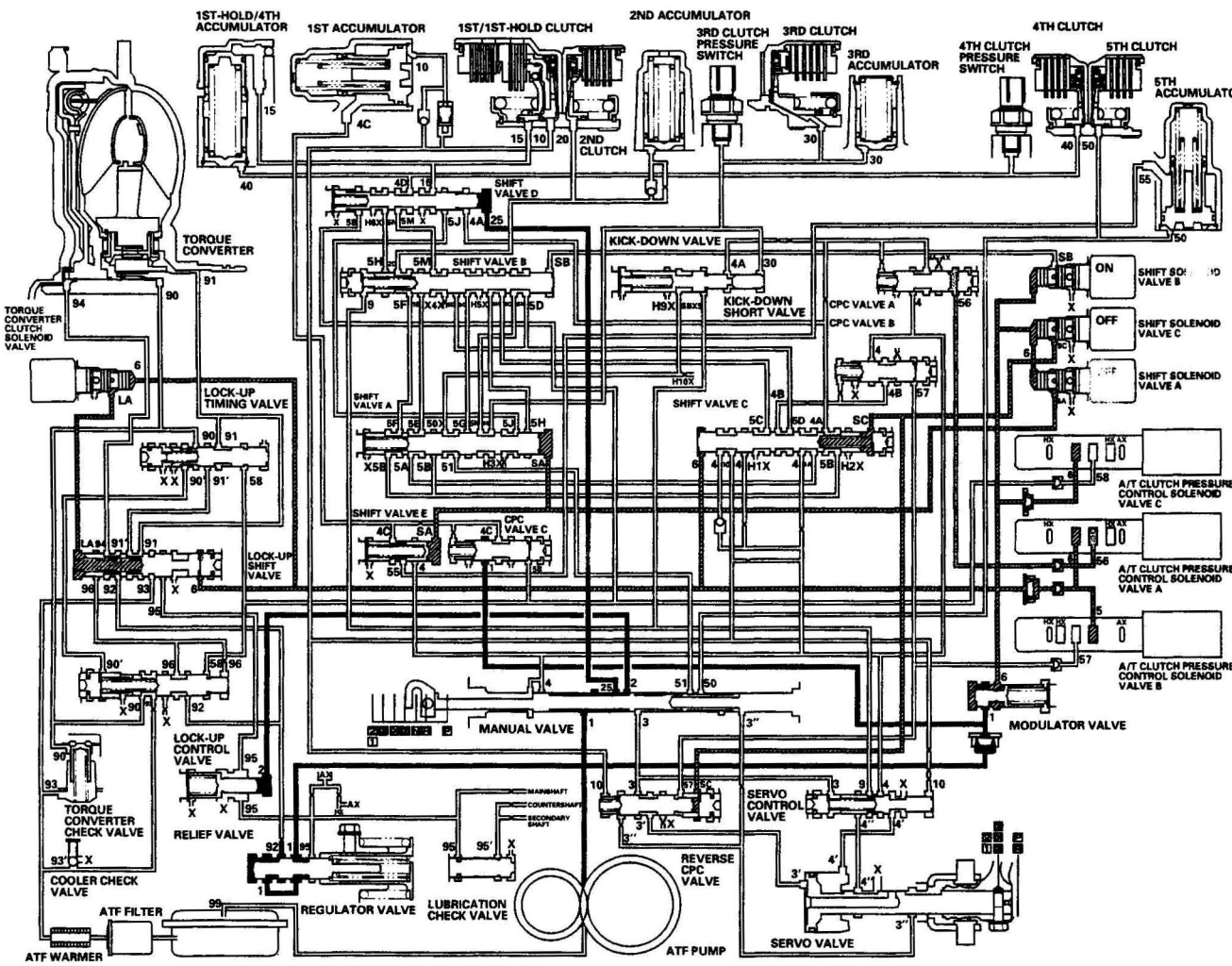
N Position

The PCM controls the shift solenoid valves. The conditions of the shift solenoid valve and positions of the shift valve are as follows:

- The shift solenoid valve A is turned OFF, and the shift valve A is moved to the left side.
- The shift solenoid valve B is turned ON, and the shift valve B remains in the right side.
- The shift solenoid valve C is turned OFF, and the shift valve C remains in the left side.

Line pressure (1) passes through the manual valve and becomes line pressure (25). Line pressure (25) stops at shift valve D. Line pressure (1) also flows to the modulator valve and becomes modulator pressure (6). Modulator pressure (6) flows to the shift solenoid valves and the A/T clutch pressure control solenoid valves. Under this condition, hydraulic pressure is not applied to the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



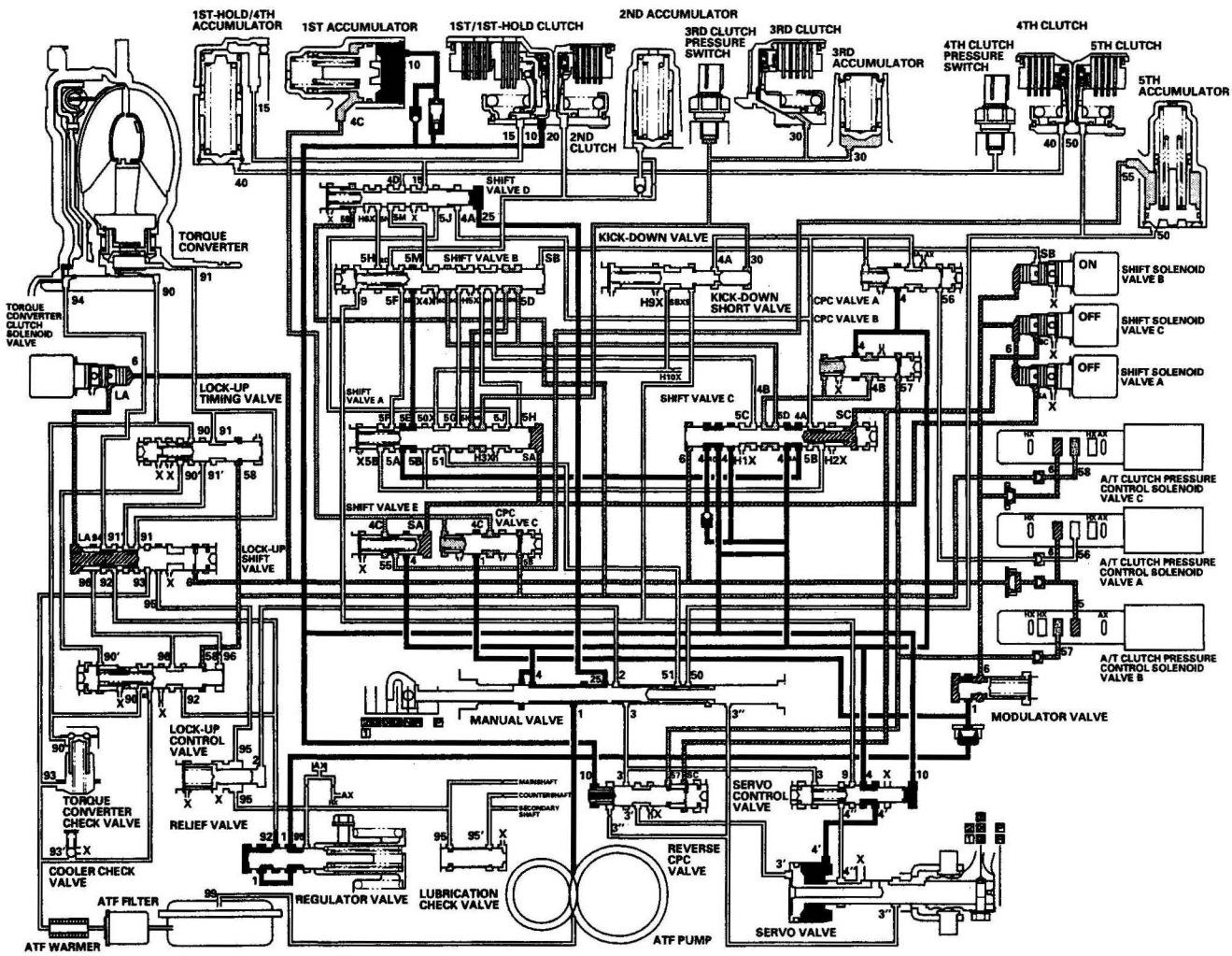
BACK

Protected by AR

D5 Position: 1st gear shifting from N position

Shift solenoid valves remain the same as in N position when shifting to D5 position from N position. The manual valve is moved to D5 position, and switches the port of line pressure (4) leading to shift valve C and CPC valve B. Line pressure (4) flows to the 1st clutch via the orifice. Line pressure (1) becomes CPC C pressure (4C) at CPC valve C, then goes to the 1st accumulator back side. Line pressure (4) also becomes the CPC B pressure (4B) at the CPC B valve. The 1st clutch is engaged gently when shifting to D5 position from N position.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

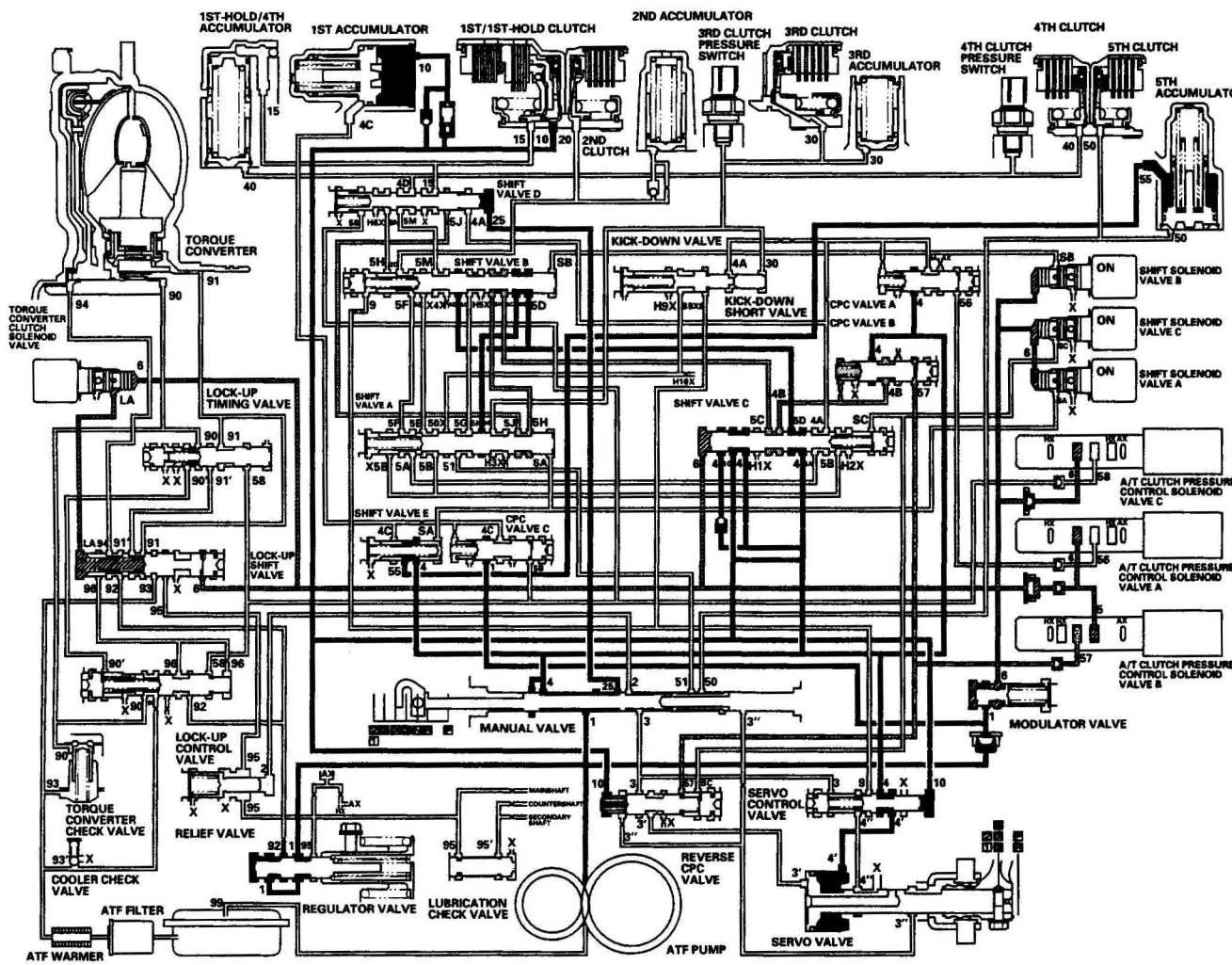
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: Driving in 1st gear

The PCM turns shift solenoid valves A and C ON, and shift solenoid valve B remains ON. SH A pressure (SA) in the right side of shift valves A and E is released, and shift valves A and E are moved to the right side. SH C pressure (SC) in the right side of shift valve C is released, and modulator pressure (6) is applied to the left side of shift valve C. Shift valve C is moved to the right side. These valve movements release CPC C pressure (4C) from the back of the 1st accumulator and the 3rd clutch, and the 1st clutch is engaged securely.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



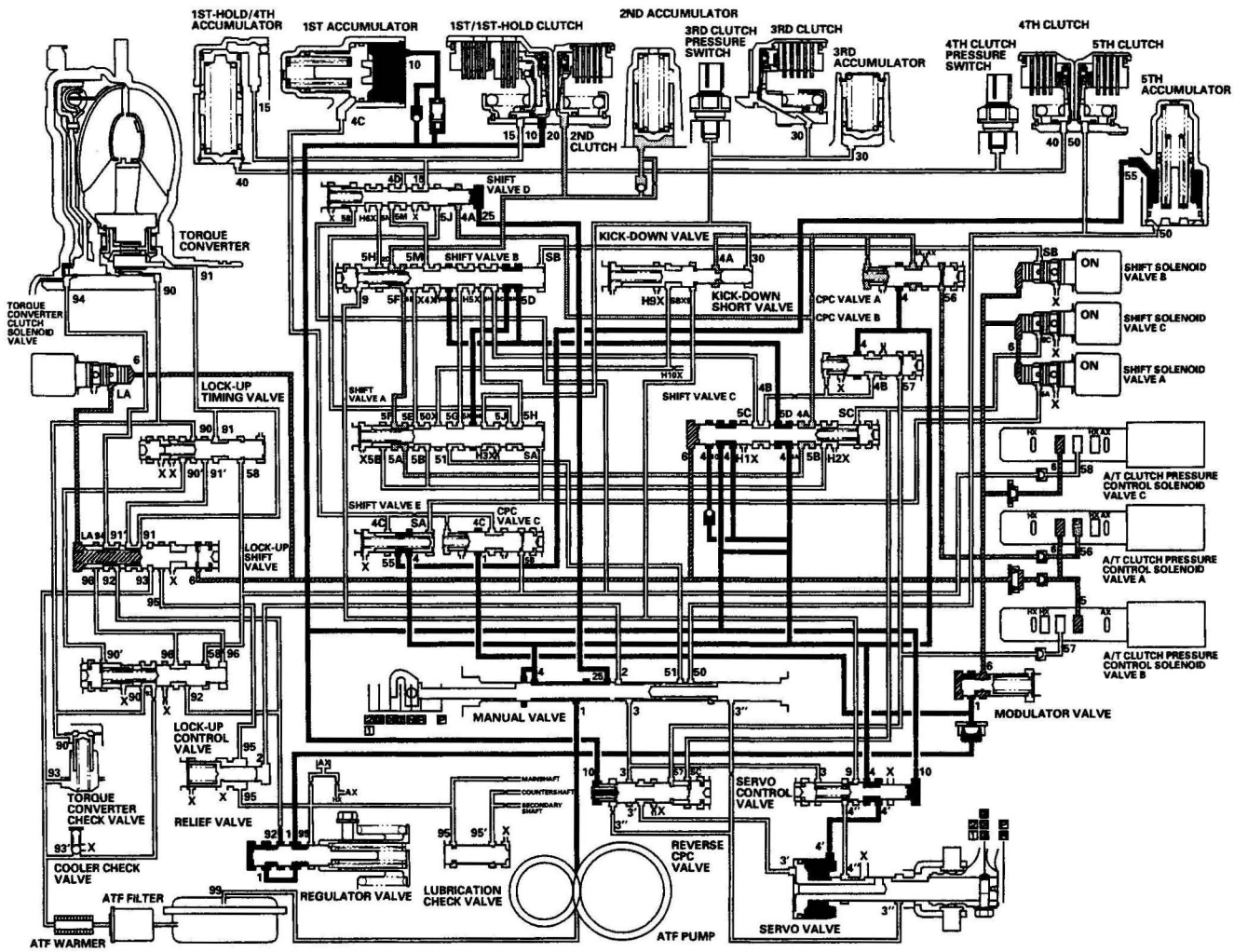
BACK

Protected by AR

Ds Position: Shifting between 1st gear and 2nd gear

As the speed of the vehicle reaches the prescribed value, the PCM controls the A/T clutch pressure control solenoid valves. LS B pressure (57) in the right side of CPC valve B is released, and LS A pressure (56) is applied to the right side of CPC valve A. Line pressure (4) becomes CPC A pressure (4A) at CPC valve A, and CPC A pressure passes through shift valves C, A, and B, to become 2nd clutch pressure. The 2nd clutch is engaged with CPC pressure, and the 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

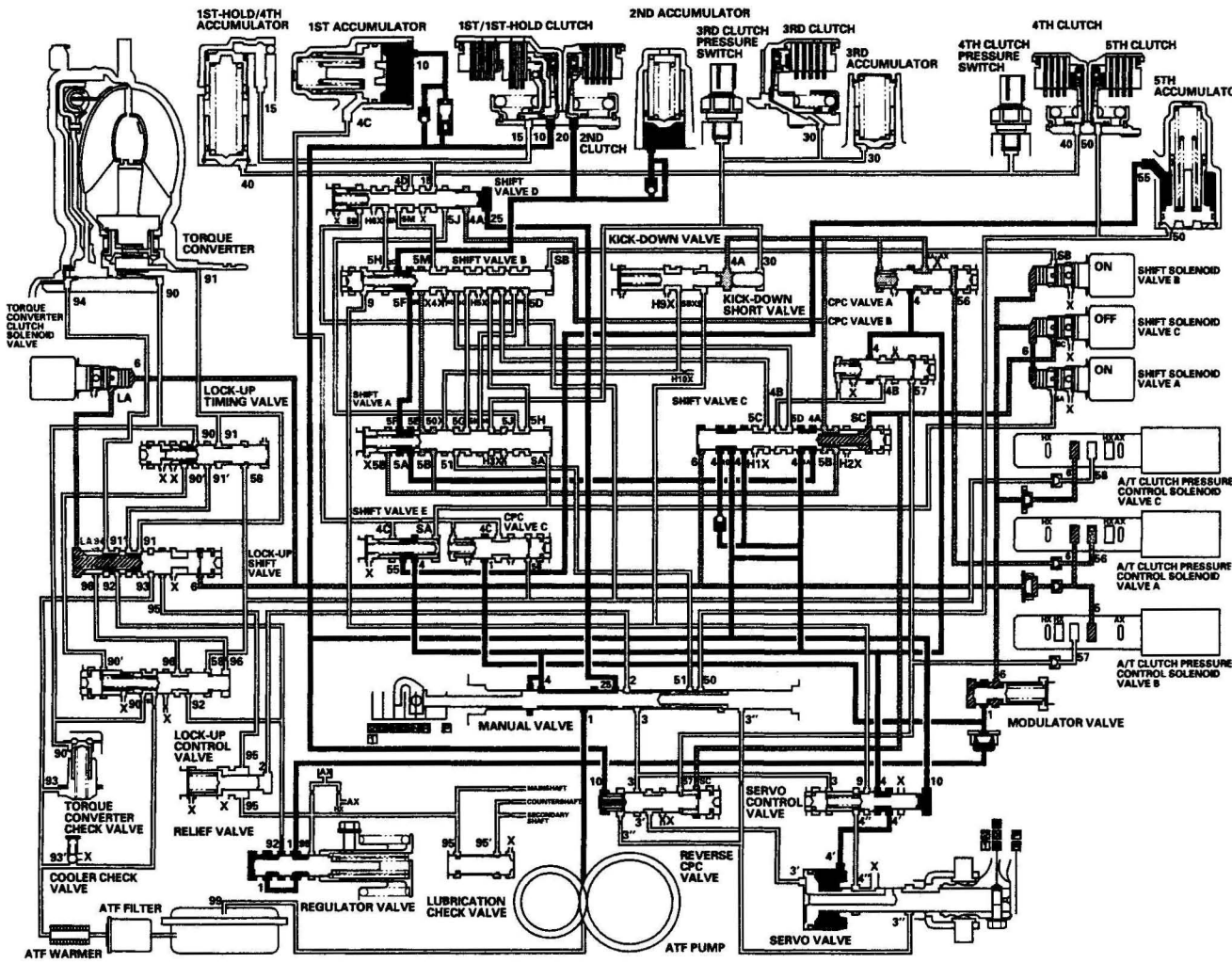
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: Driving in 2nd gear

The PCM turns shift solenoid valve C OFF, and shift solenoid valves A and B remain ON. Shift solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of shift valve C. Then shift valve C is moved to the left side to switch the port of line pressure and CPC pressure. The 2nd clutch pressure is changed to line pressure mode, and the 2nd clutch is engaged securely. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



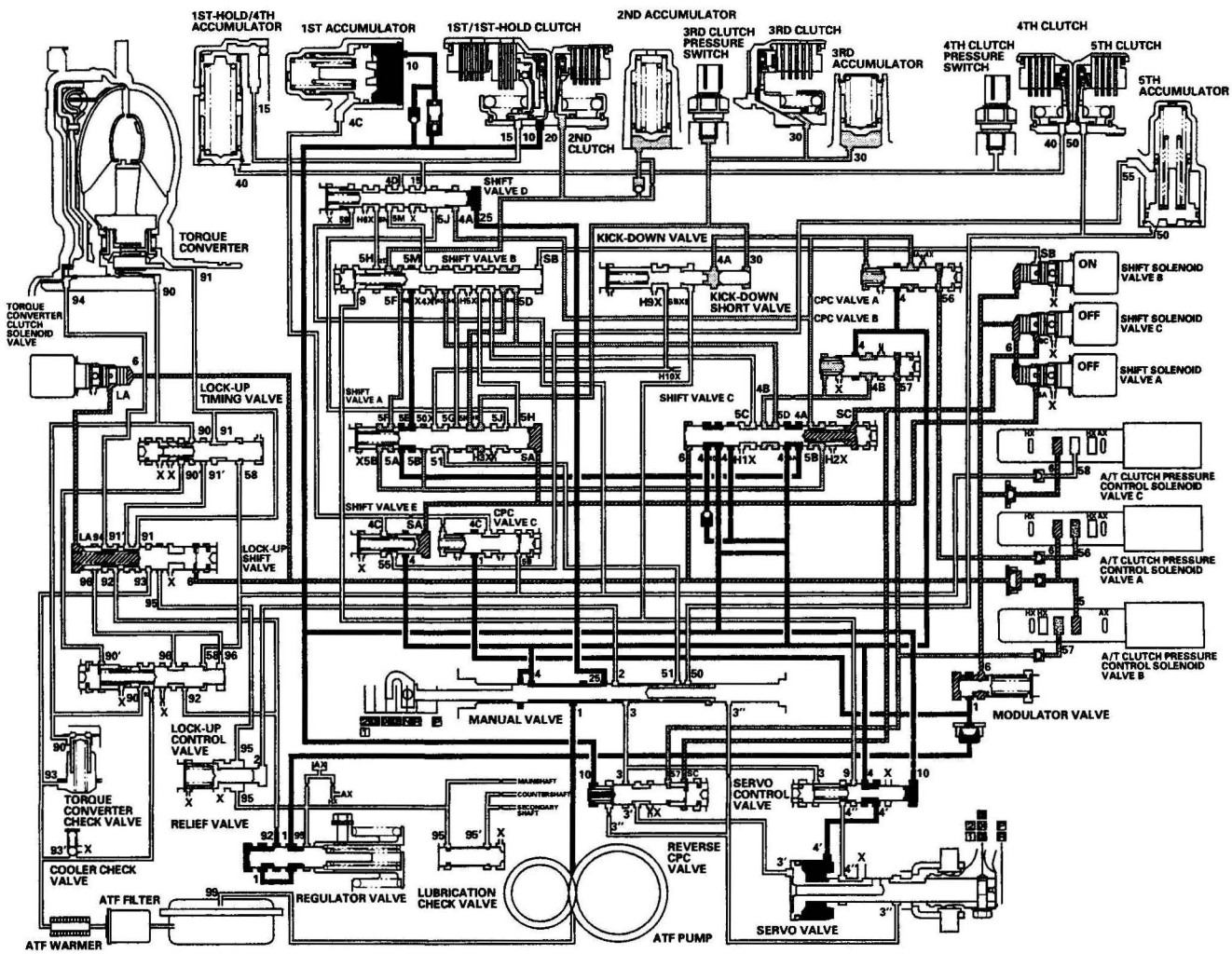
BACK

Protected by AR

Ds Position: Shifting between 2nd gear and 3rd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valve A OFF. The PCM also controls the A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B. Shift solenoid valve B remains ON, and C remains OFF. Shift solenoid valve A is turned OFF, and SH A pressure (SA) is applied to the right side of shift valves A and E. Then shift valves A and E are moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) becomes CPC A pressure (4A) at CPC valve A, and becomes CPC B pressure (4B) at CPC valve B. CPC B pressure (4B) becomes 3rd clutch pressure (30) at shift valve A via shift valves C and B, and flows to the 3rd clutch. The 2nd clutch pressure is changed to CPC pressure mode by switching the position of shift valve A. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

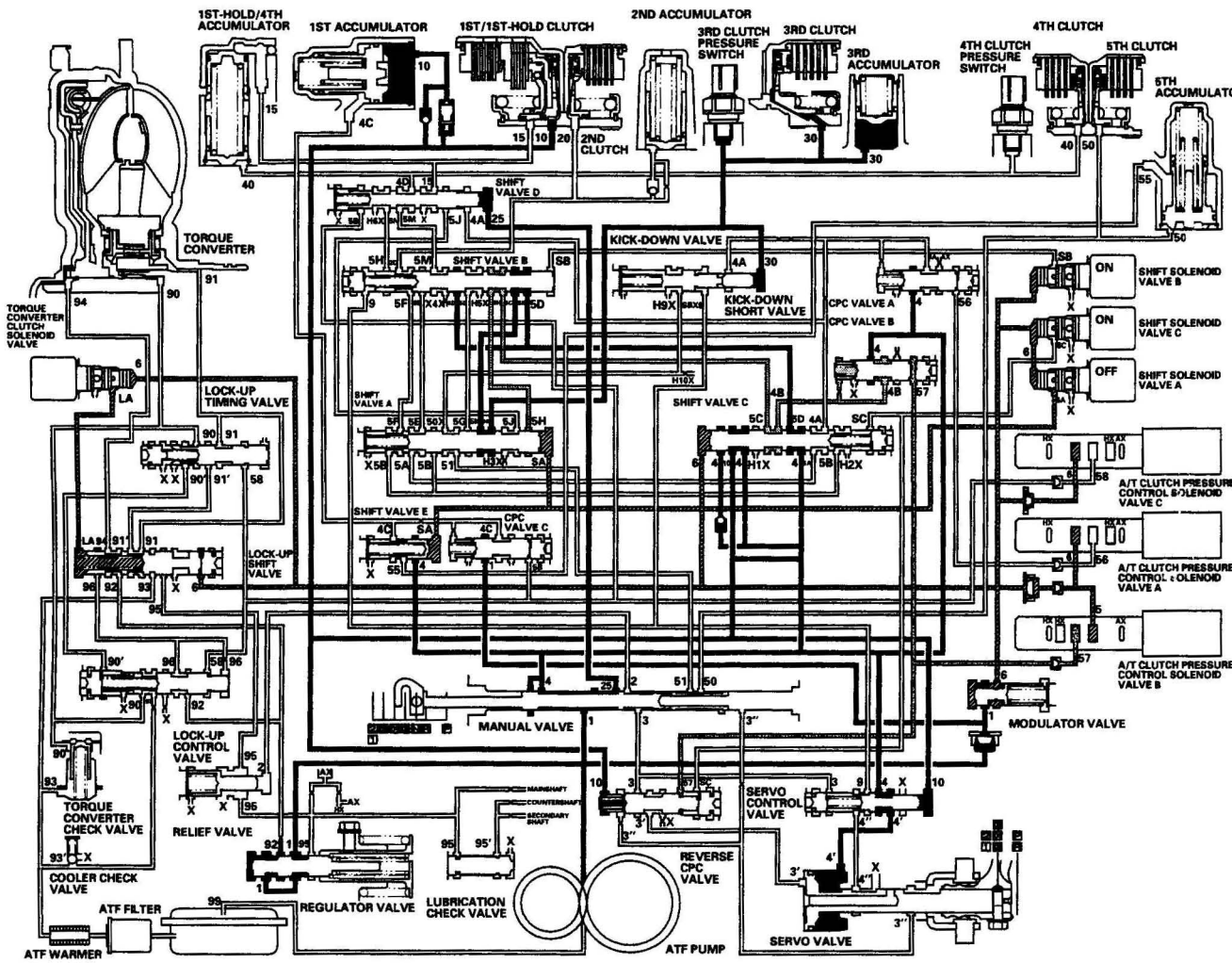
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: Driving in 3rd gear

The PCM turns shift solenoid valve C ON, and controls A/T clutch pressure control solenoid valve A to release LS A pressure (56) in CPC valve A. Shift solenoid valve A remains OFF, and B remains ON. Releasing LS A pressure (56) in CPC valve A releases CPC A pressure in the 2nd clutch pressure circuit. Shift solenoid valve C is turned ON, and SH C pressure (SC) in the right side of shift valve C is released. Then shift valve C is moved to the right side to switch the port of line pressure and CPC pressure. The 3rd clutch pressure is changed to line pressure mode, and the 3rd clutch is engaged securely. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



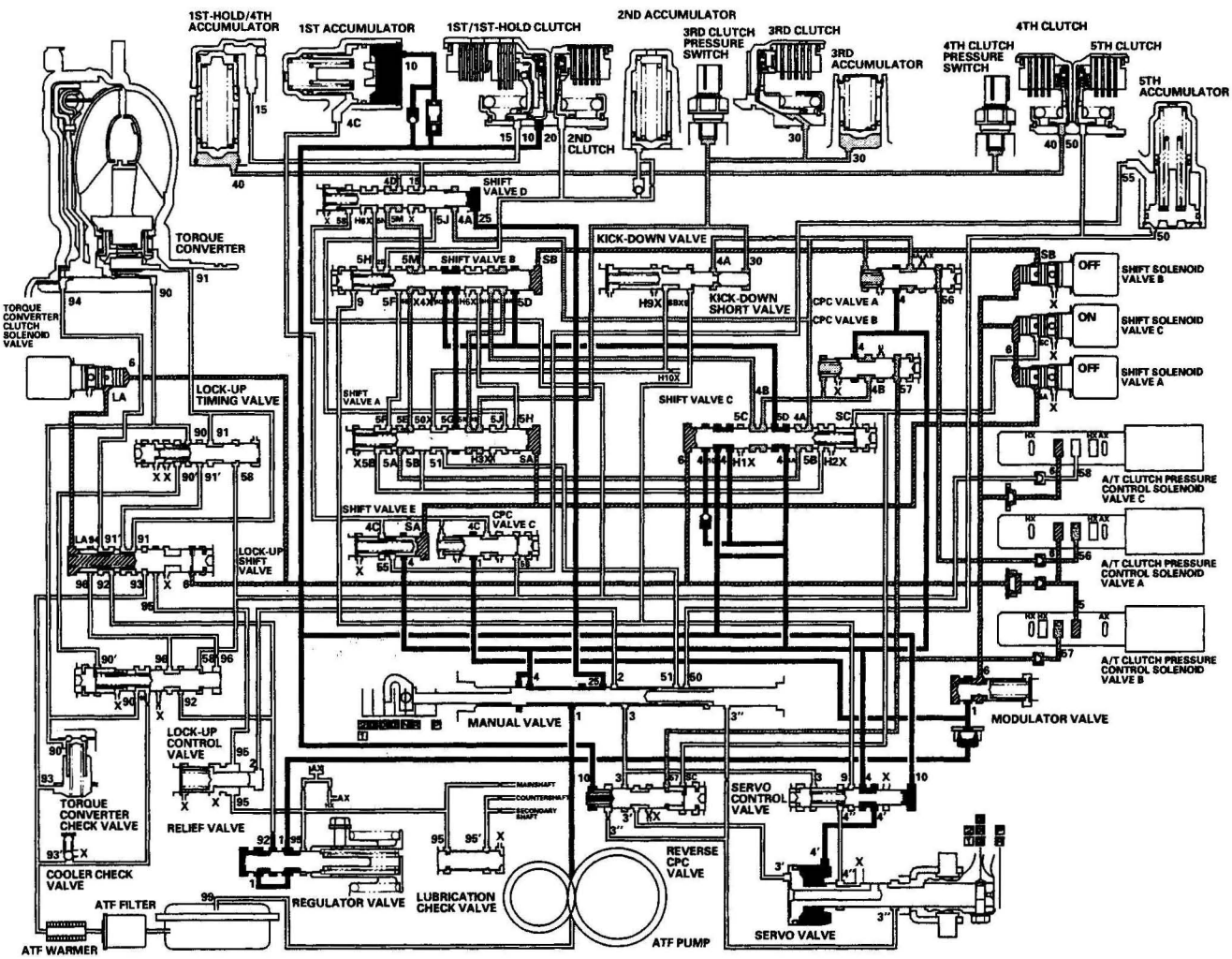
BACK

Protected by AR

Ds Position: Shifting between 3rd gear and 4th gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valve B OFF. The PCM also controls the A/T clutch pressure control solenoid valve A to apply LS A pressure (56) to CPC valve A. Shift solenoid valve A remains OFF, and C remains ON. Shift solenoid valve B is turned OFF, and SH B pressure (SB) is applied to the right side of shift valve B. Then shift valve B is moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) becomes CPC A pressure (4A) at CPC valve A, and becomes CPC B pressure (4B) at CPC valve B. CPC A pressure (4A) becomes 4th clutch pressure (40) at shift valve D via shift valves C, A, and B, and flows to the 4th clutch. The 3rd clutch pressure is changed to CPC pressure mode by switching the position of shift valve B. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

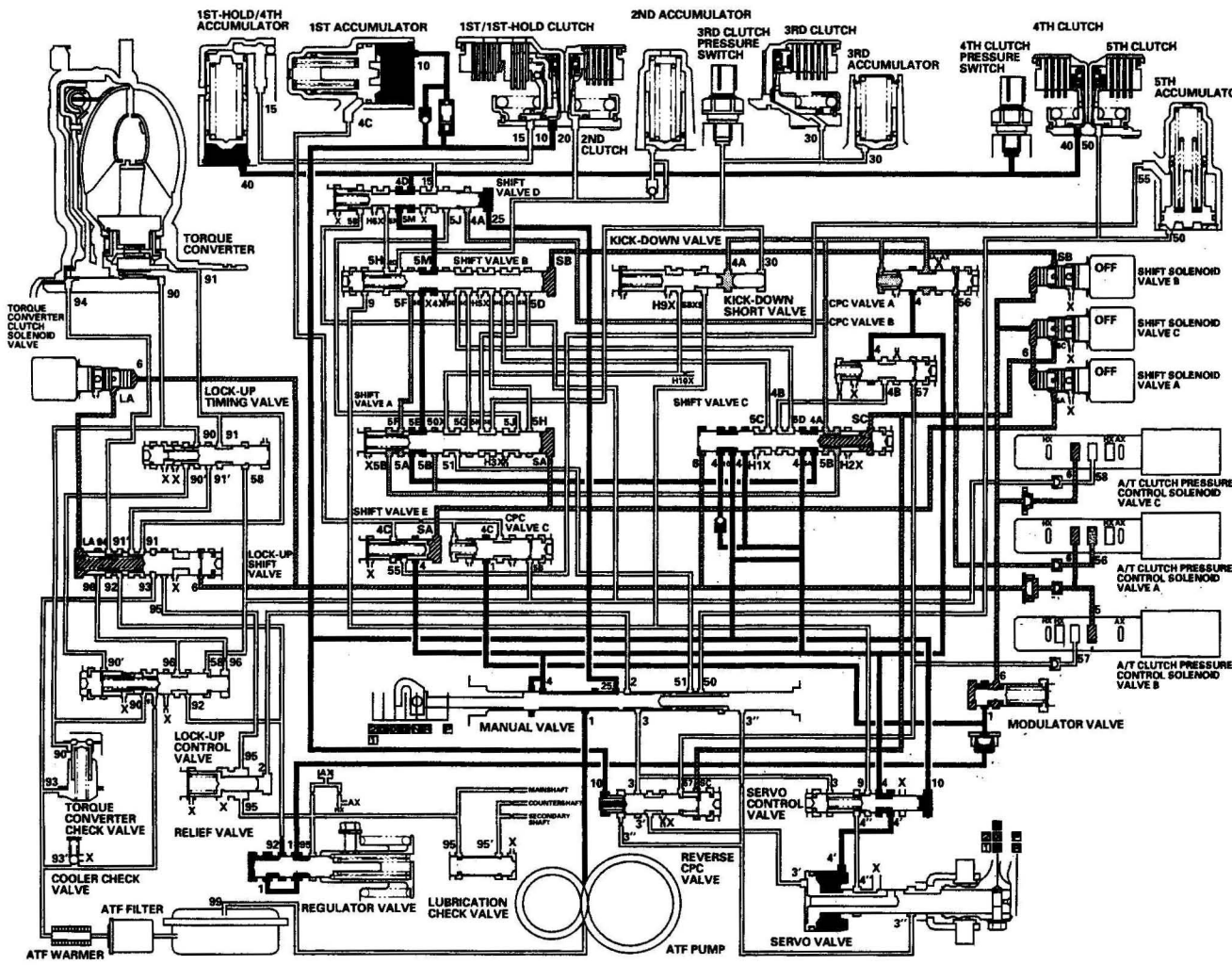
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: Driving in 4th gear

The PCM turns shift solenoid valve C OFF, and controls A/T clutch pressure control solenoid valve B to release LS B pressure (57) in CPC valve B. Shift solenoid valves A and B remain OFF. Releasing LS B pressure (57) in CPC valve B releases CPC B pressure in the 3rd clutch pressure circuit. Shift solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of shift valve C. Then shift valve C is moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) from the manual valve becomes 4th clutch pressure (40) at shift valve D via shift valves C, A, and B, and flows to the 4th clutch. The 4th clutch pressure is changed to line pressure mode by switching the position of shift valve C, and the 4th clutch is engaged securely. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



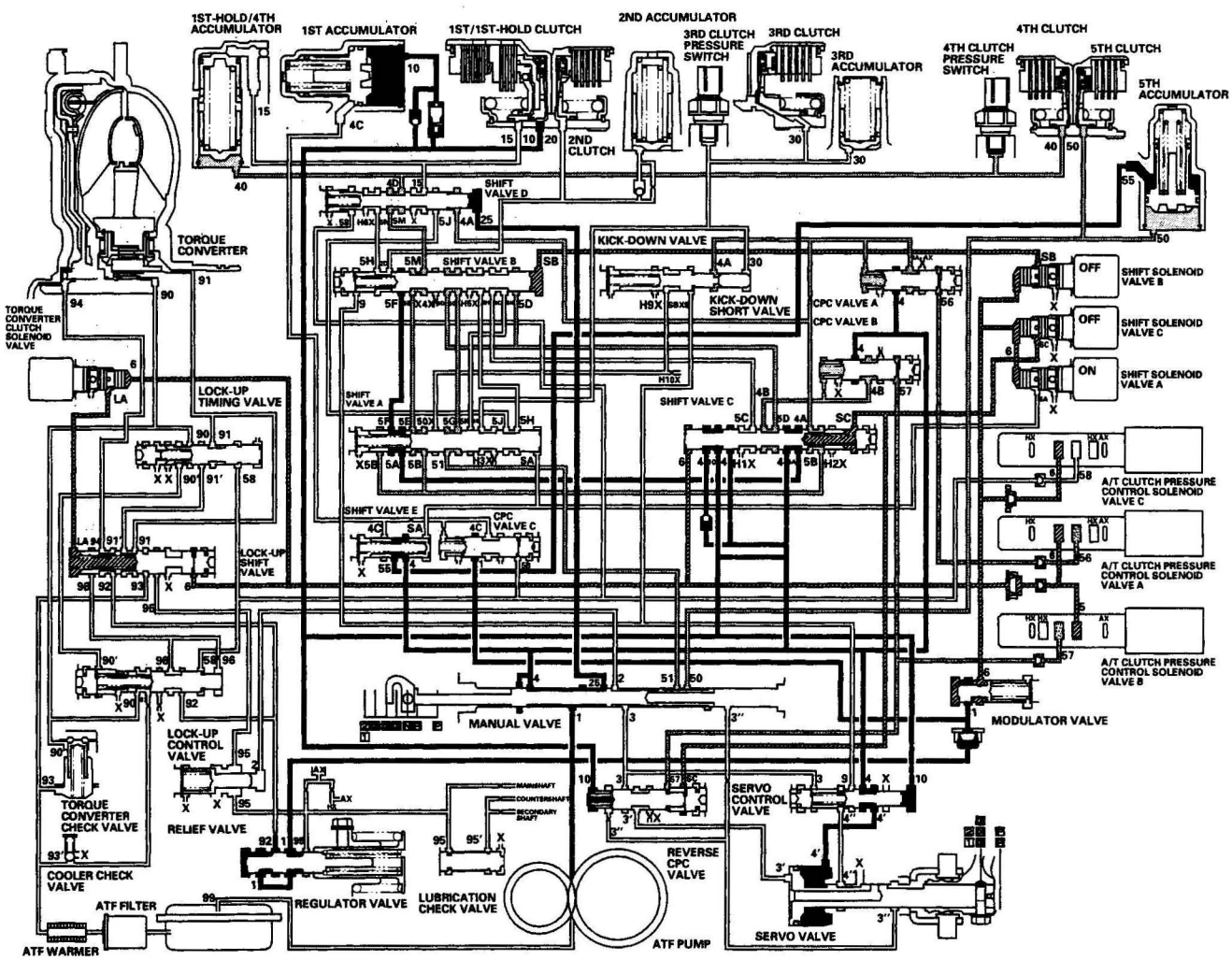
BACK

Protected by AR

D5 Position: Shifting between 4th gear and 5th gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valve A ON. The PCM also controls the A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B.
Shift solenoid valve B and C remain OFF. Shift solenoid valve A is turned ON, and SH A pressure (SA) in the right side of shift valves A and E is released. Then shift valves A and E are moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) becomes CPC A pressure (4A) at CPC valve A, and becomes CPC B pressure (4B) at CPC valve B. CPC B pressure (4B) becomes 5th clutch pressure (50) at shift valve C, and flows to the 5th clutch via shift valves B and A and the manual valve. The 4th clutch pressure is changed to CPC pressure mode by switching the position of shift valve A. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

BACK

Protected by AR

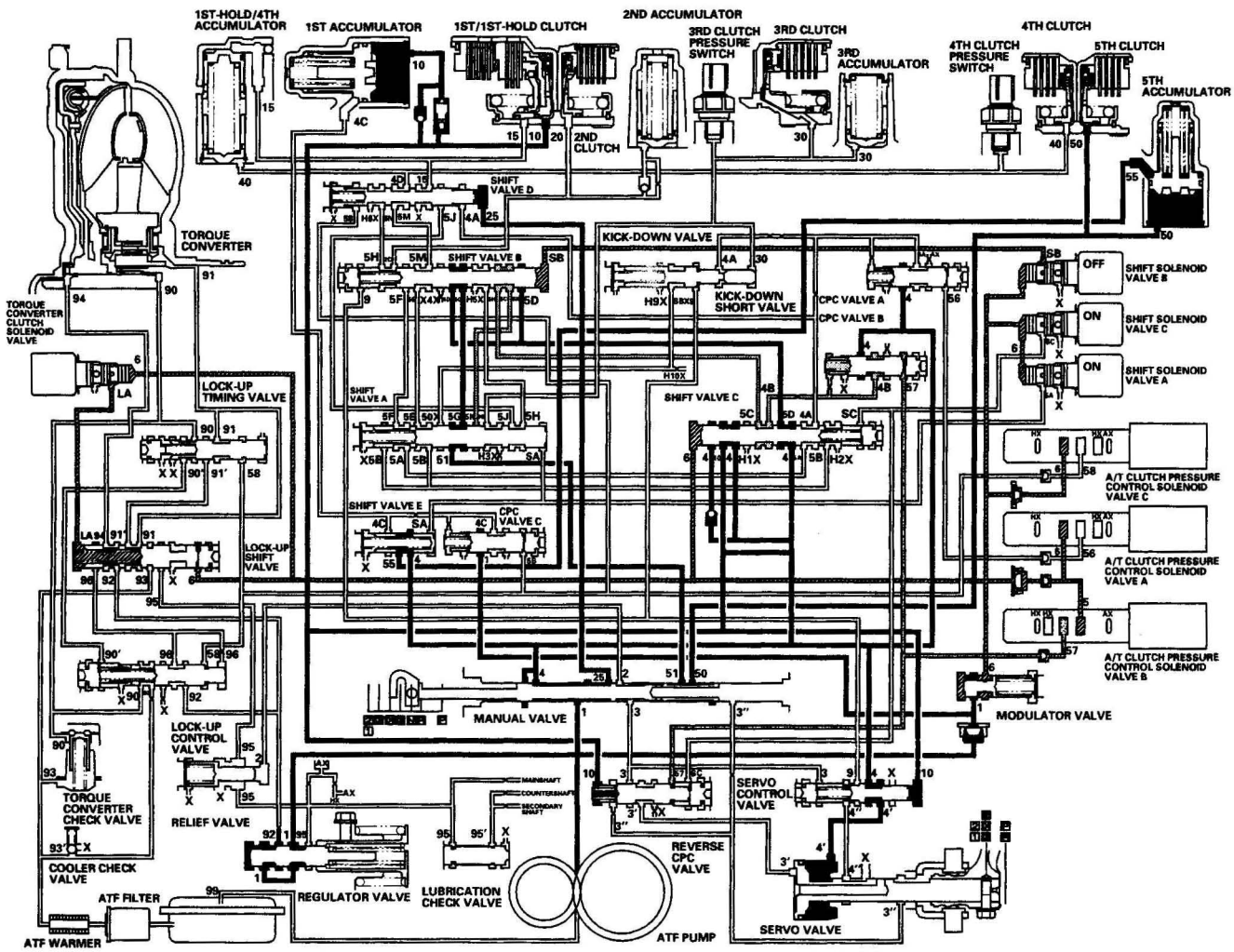
System Description (cont'd)

Hydraulic Flow (cont'd)

D5 Position: Driving in 5th gear

The PCM turns shift solenoid valve C ON, and controls A/T clutch pressure control solenoid valve A to release LS A pressure (56) in CPC valve A. Shift solenoid valve A remains ON, and B remains OFF. Releasing LS A pressure (56) in CPC valve A releases CPC A pressure in the 4th clutch pressure circuit. Shift solenoid valve C is turned ON, and SH C pressure (SC) in the right side of shift valve C is released. Then shift valve C is moved to the right side to switch the port of line pressure and CPC pressure. Line pressure (4) from the manual valve becomes 5th clutch pressure (50) at the manual valve, via shift valves C, B, and A, and flows to the 5th clutch. The 5th clutch pressure is changed to line pressure mode by switching the position of shift valve C. The 5th clutch is engaged securely, and the 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



BACK

Protected by AR

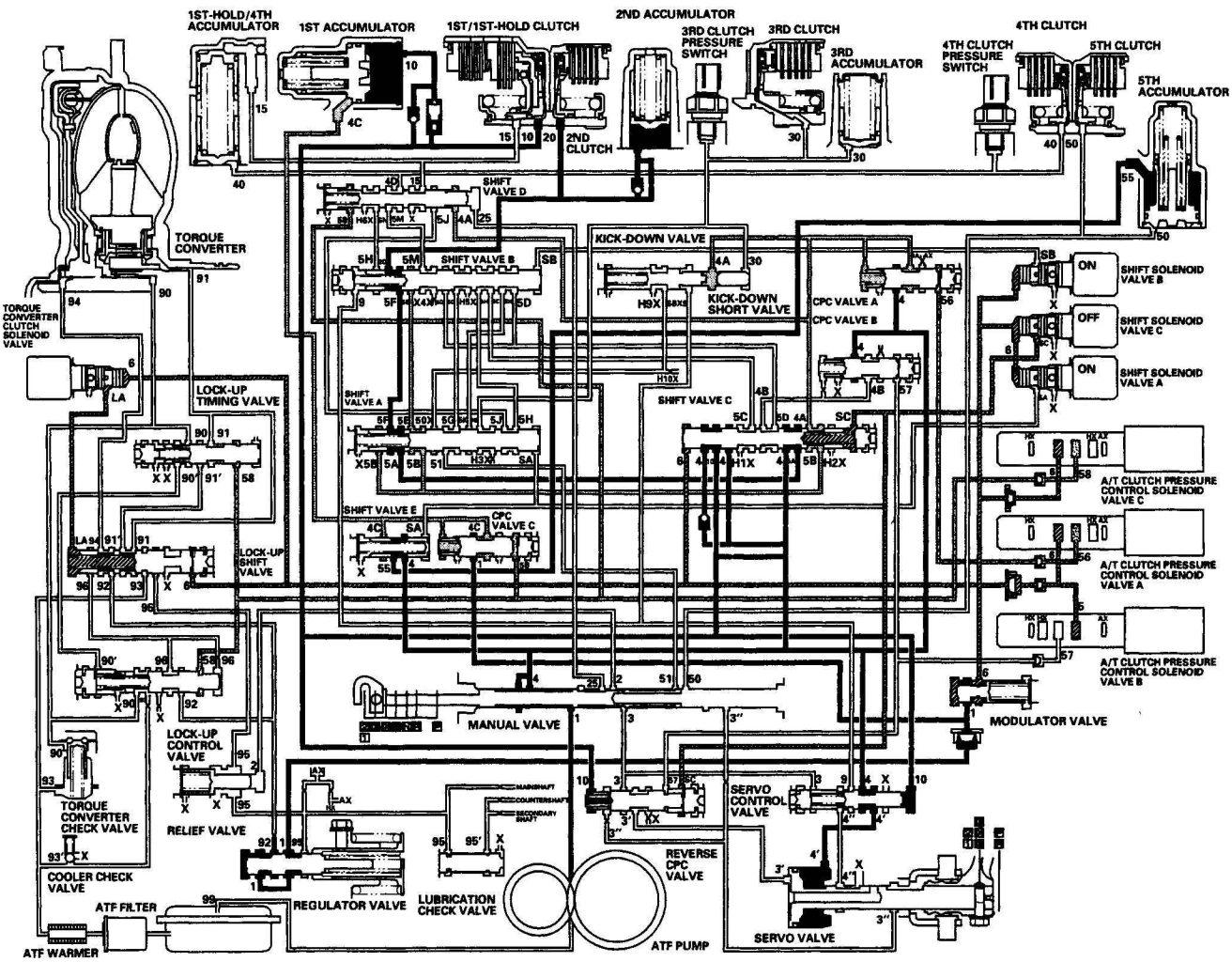
2 Position

The PCM controls the shift solenoid valves and the A/T clutch pressure control solenoid valves. The conditions of the shift solenoid valves and the positions of shift valves are as follows:

- Shift solenoid valve A is turned ON, and shift valve A is in the right side.
- Shift solenoid valve B is turned ON, and shift valve B is in the right side.
- Shift solenoid valve C is turned OFF, and shift valve C is in the left side.

The PCM also controls A/T clutch pressure control solenoid valve A to apply LS A pressure (56) to CPC valve A. Line pressure (4) from the manual valve becomes 2nd clutch pressure (20) at shift valve B, via shift valves C and A. 2nd clutch pressure (20) is applied to the 2nd clutch, and the 2nd clutch is engaged. The 1st clutch is also engaged. No power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Protected by AR

System Description (cont'd)

Hydraulic Flow (cont'd)

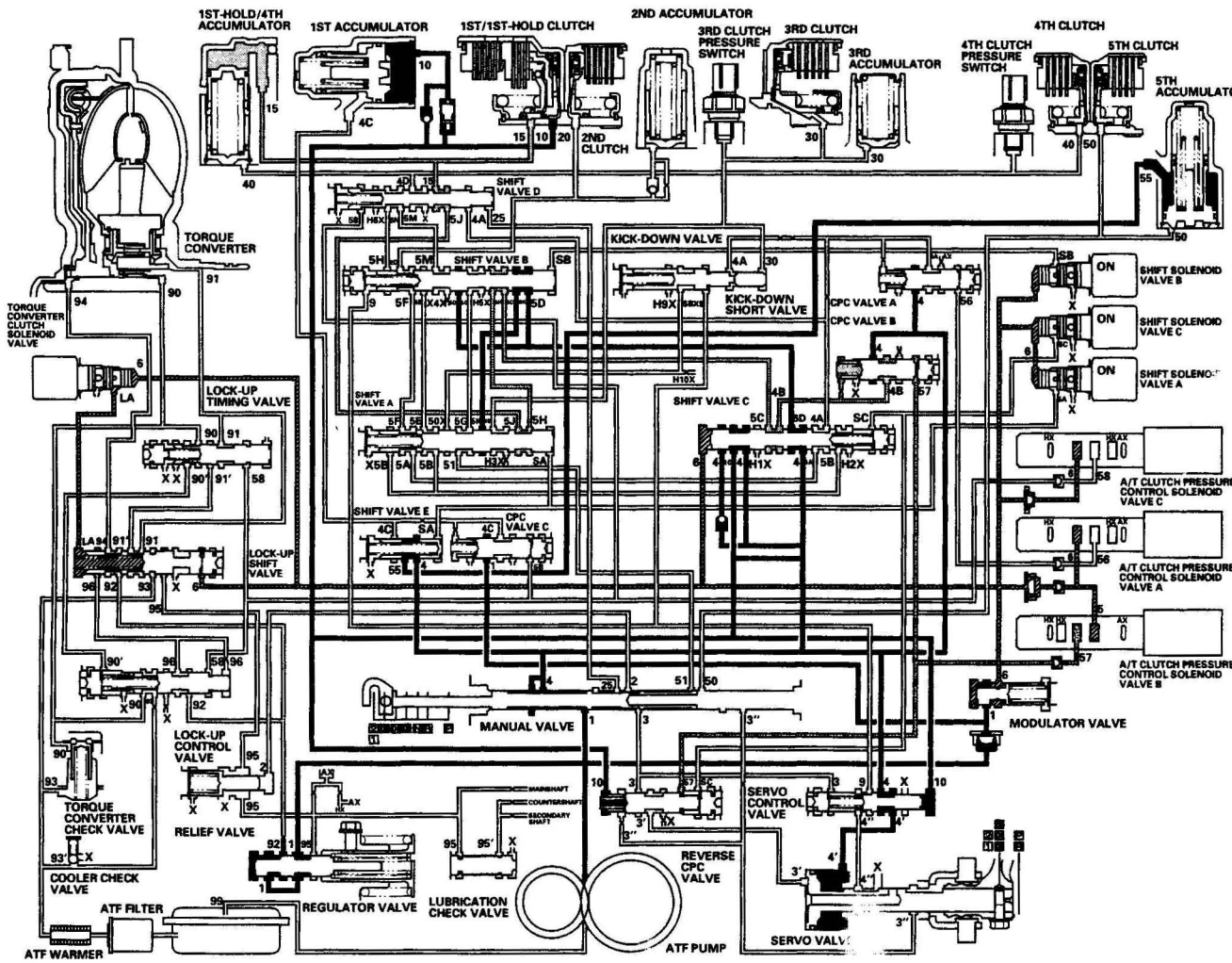
1 Position

The PCM controls the shift solenoid valves and the A/T clutch pressure control solenoid valves. The conditions of the shift solenoid valves and the positions of shift valves are as follows:

- Shift solenoid valve A is turned ON, and shift valve A is in the right side.
- Shift solenoid valve B is turned ON, and shift valve B is in the right side.
- Shift solenoid valve C is turned ON, and shift valve C is moved to the right side by modulator pressure (6).

The PCM also controls A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B. Line pressure (4) from the manual valve becomes 1st clutch pressure (10) at shift valve C. 1st clutch pressure (10) is applied to the 1st clutch, and the 1st clutch is engaged. Line pressure (4) also flows to CPC valve B, and becomes CPC B pressure (4B). CPC B pressure (4B) becomes 1st-hold clutch pressure (15) at shift valve D, via shift valves C, B, and A. 1st-hold clutch pressure (15) is applied to the 1st-hold clutch, and the 1st-hold clutch is engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



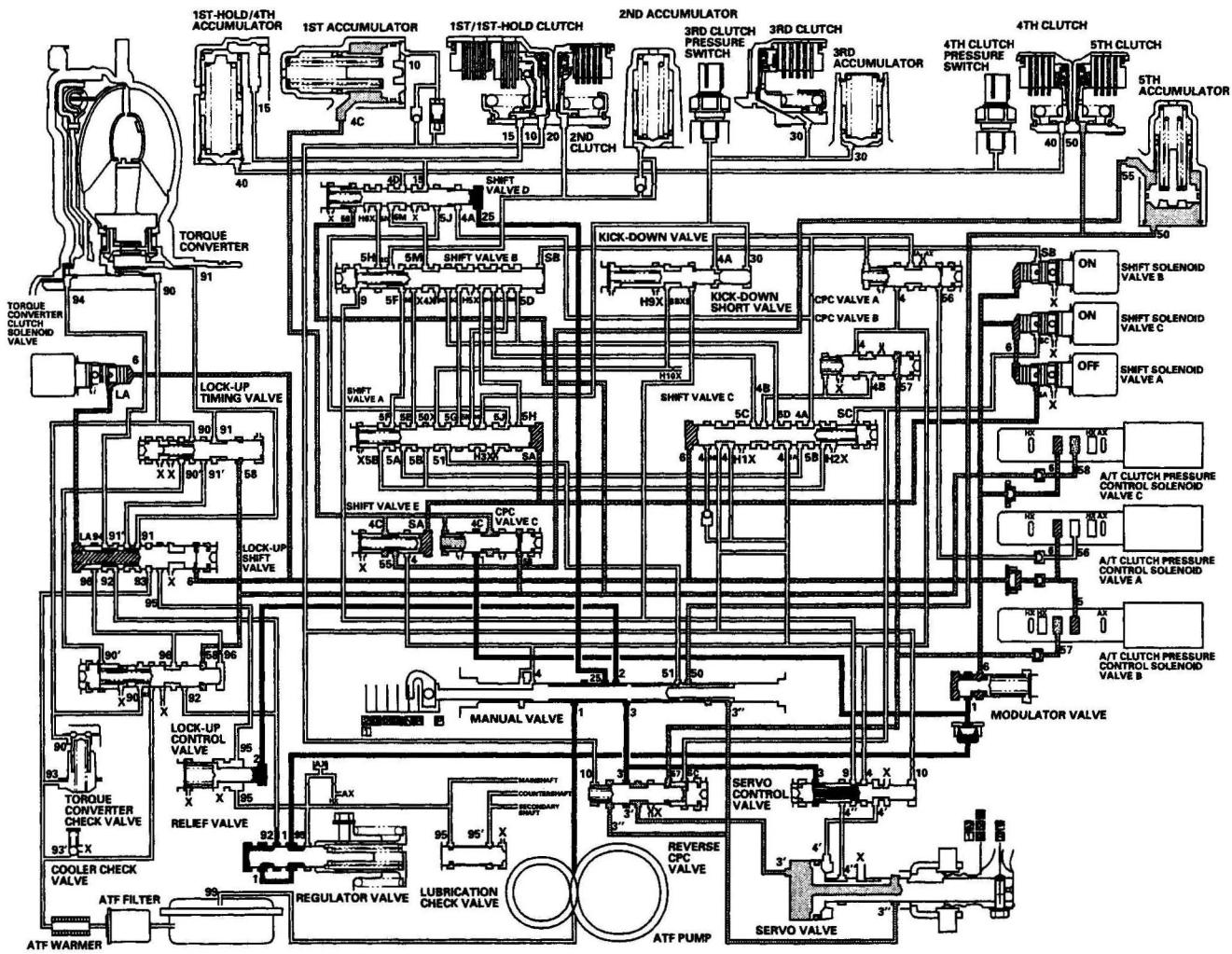
BACK

Protected by AR

[R] Position: Shifting to [R] position from [P] or [N] position

Line pressure (1) becomes line pressure (3) at the manual valve, and flows to the reverse CPC valve. Line pressure (3) is regulated by the reverse CPC valve and becomes line pressure (3'). Line pressure (3') pushes the servo valve to the reverse position, passes through the servo valve, and flows to the manual valve. Line pressure (3'') becomes 5th clutch pressure (50). The 5th clutch pressure (50) is applied to the 5th clutch, and 5th clutch is engaged with the reverse CPC pressure mode.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Protected by AR

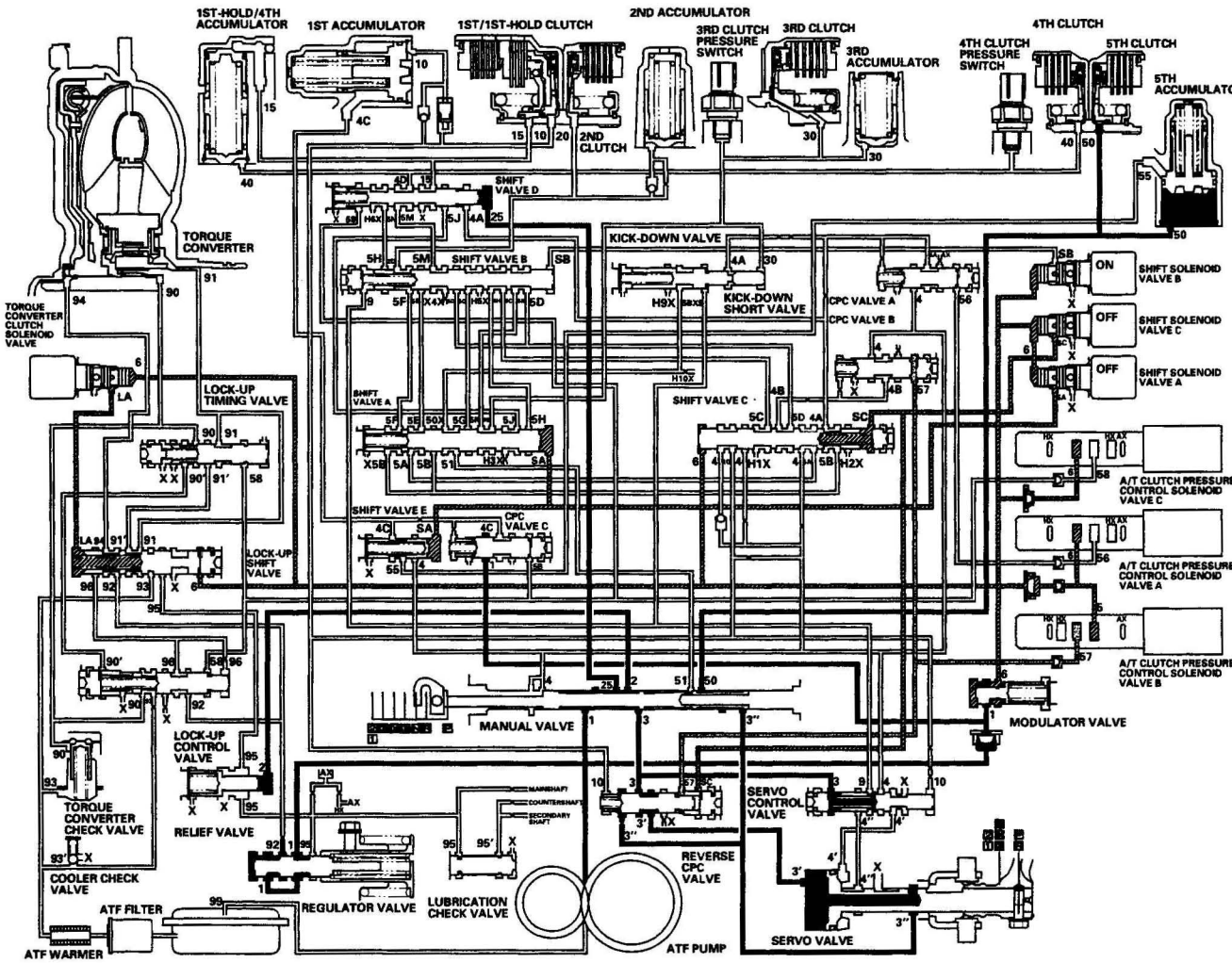
System Description (cont'd)

Hydraulic Flow (cont'd)

[R] Position: Driving in reverse gear
The PCM turns shift solenoid valve C OFF. Shift solenoid valve A remains OFF and B remains ON. Shift solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of the reverse CPC valve. Then the reverse CPC valve moves to the left side, creating full line pressure. Line pressure to the 5th clutch is the same as when shifting to [R] position, and 5th clutch pressure increases. The 5th clutch is engaged with line pressure mode.

Reverse Inhibitor Control
When the [R] position is selected while the vehicle is moving forward at speeds over 6 mph (10 km/h), the PCM outputs to turn shift solenoid valves A and C ON; and shift solenoid valve B remains ON. The reverse CPC valve is moved to right side and covers the port to stop the line pressure (3') to the servo valve. The line pressure (3') is not applied to the servo valve, and the 5th clutch pressure (50) is not applied to the 4th clutch. As a result, power is not transmitted to the reverse position.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



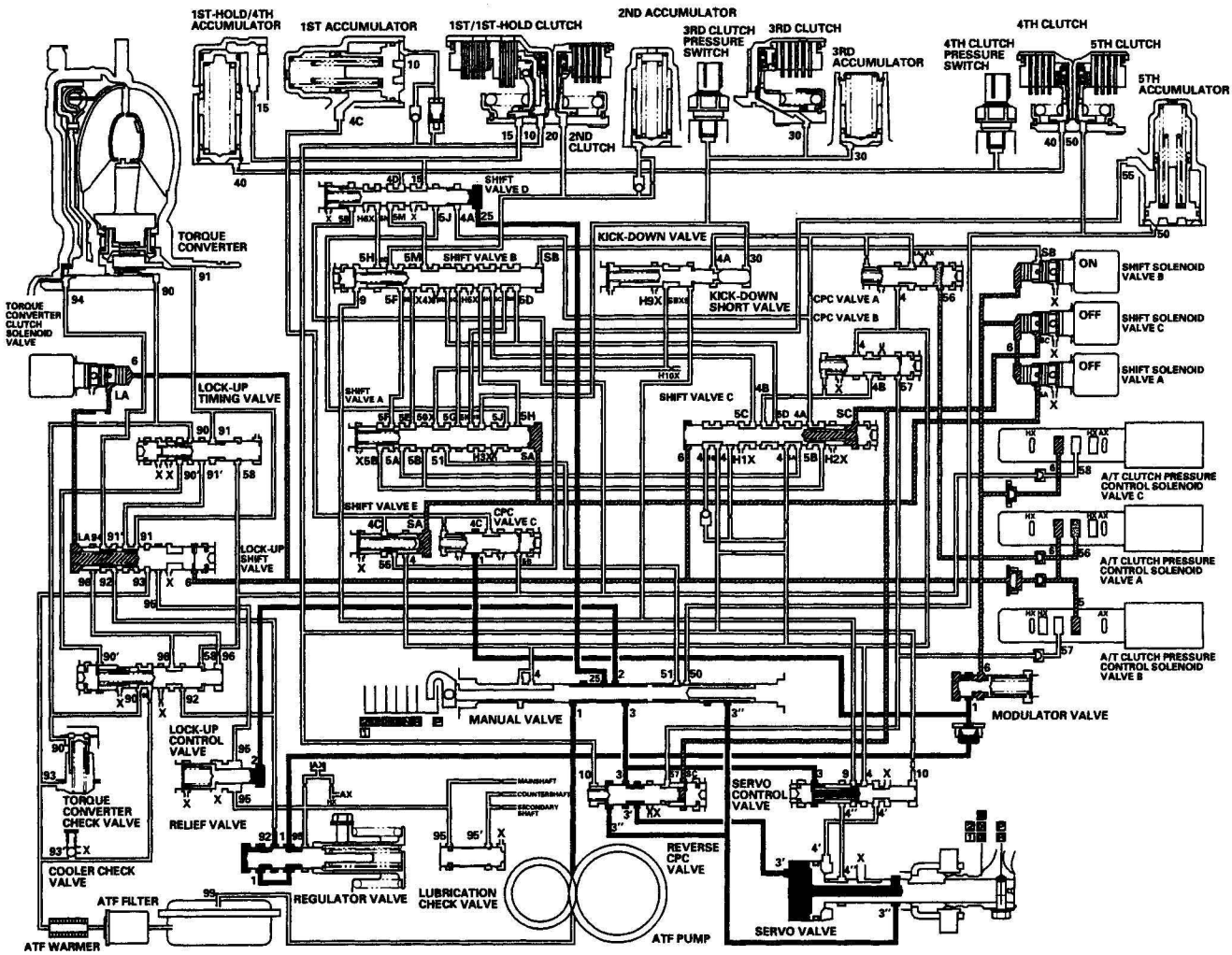
BACK

Protected by AR

P Position

Shift solenoid valve C is turned OFF by the PCM, and SH C pressure (SC) is applied to the right side of the reverse CPC valve. Then the reverse CPC valve is moved to the left side to uncover the port leading line pressure (3) to the servo valve. Line pressure (3') passes through the servo valve and flows to the manual valve. Line pressure (3'') is intercepted at the manual valve, and is not applied to the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Protected by AR

System Description (cont'd)

Lock-up System

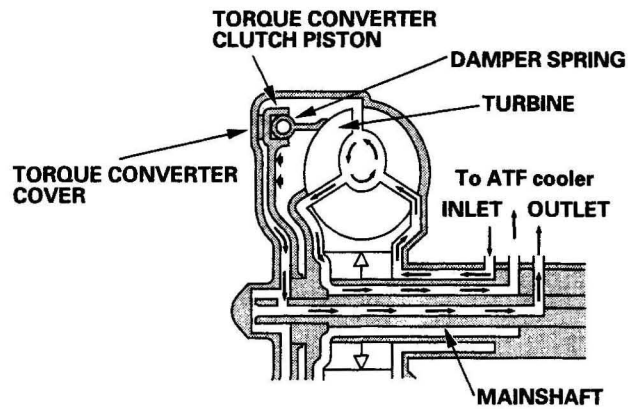
The lock-up mechanism of the torque converter clutch operates in the D5 position (3rd, 4th, and 5th), in D4 position (3rd and 4th), and D3 position (3rd). The pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the torque converter clutch piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with the hydraulic control, the PCM optimizes the timing and amount of the lock-up mechanism. When torque converter clutch solenoid valve is turned on by the PCM, the torque converter clutch solenoid valve pressure switches the lock-up shift valve lock-up on and off. The A/T clutch pressure control solenoid valve A and the lock-up control valve control the amount of lock-up.

Torque Converter Clutch Lock-up ON (Engaging Torque Converter Clutch)
Fluid in the chamber between the torque converter cover and the torque converter clutch piston is drained off, and fluid entered from the chamber between the pump and stator exerts pressure through the torque converter clutch piston against the torque converter cover. The torque converter clutch piston engages with the torque converter cover; torque converter clutch lock-up ON, and the mainshaft rotates at the same as the engine.

Power flow

The power flows by way of:

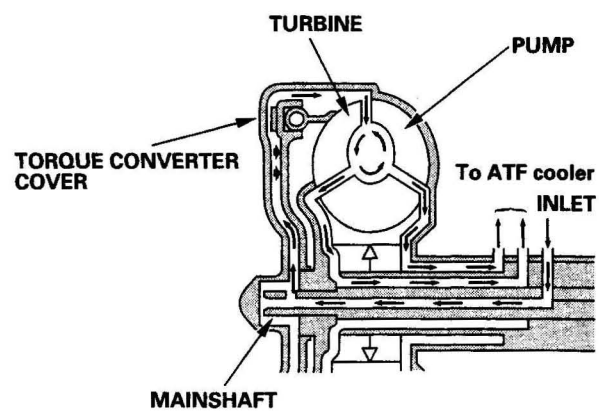
Engine
↓
Drive plate
↓
Torque converter cover
↓
Torque converter clutch piston
↓
Damper spring
↓
Turbine
↓
Mainshaft



Torque Converter Clutch Lock-up OFF (Disengaging Torque Converter Clutch)
Fluid entered from the chamber between the torque converter cover and the torque converter clutch piston passes through the torque converter and goes out from the chambers between the turbine and the stator, and between the pump and the stator. As a result, the torque converter clutch piston moves away from the torque converter cover, and the torque converter clutch lock-up is released; torque converter clutch lock-up OFF.

Power flow

Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft



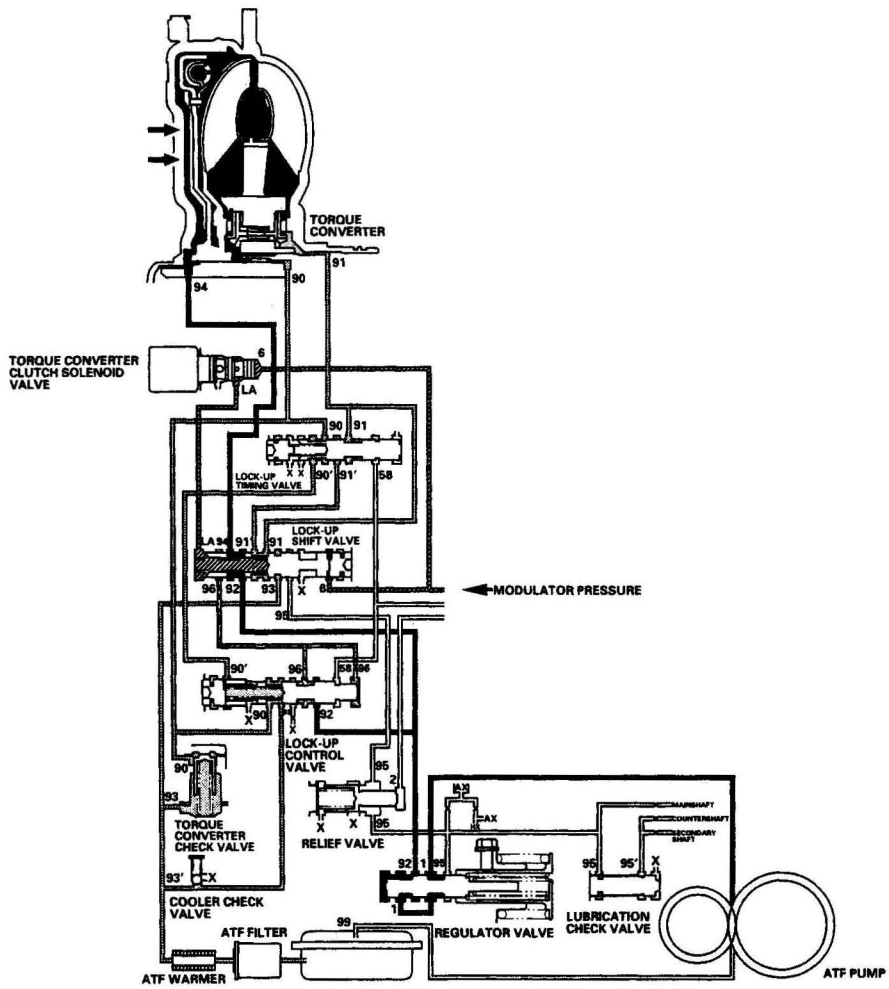
BACK

Protected by AR

No Lock-up

The torque converter clutch solenoid valve is turned OFF by the PCM. The lock-up shift valve receives LC pressure (LA) on the left side, and modulator pressure (6) on the right side. The lock-up shift valve is in the right side to uncover the port leading torque converter pressure (92) to the left side of the torque converter. Torque converter pressure (92) becomes torque converter pressure (94), and enters into the left side of the torque converter to disengage the lock-up clutch. The lock-up clutch is OFF.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Protected by AR

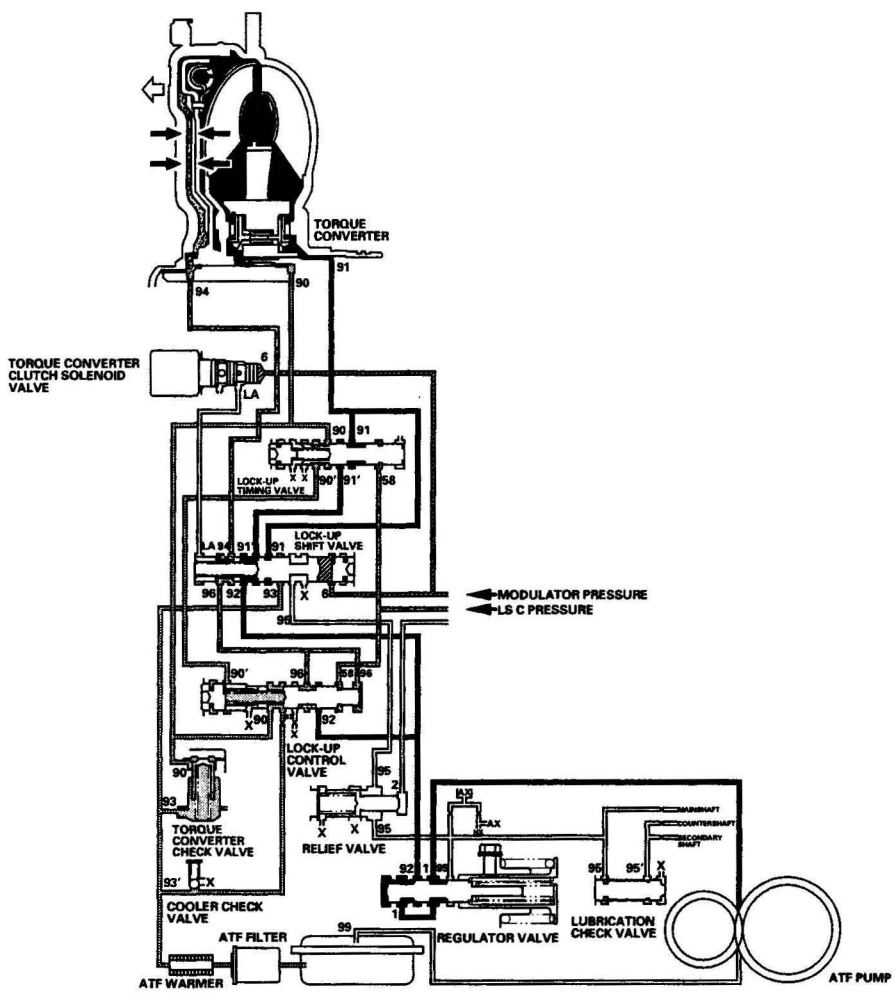
System Description (cont'd)

Lock-up System (cont'd)

Partial Lock-up

As the speed of the vehicle reaches the prescribed value, the torque converter clutch solenoid valve is turned ON by the PCM to release LC pressure (LA) in the left cavity of the lock-up shift valve. Modulator pressure (6) is applied to the right side of the lock-up shift valve, then the lock-up shift valve is moved in the left side to switch the port leading torque converter pressure to the right side of the torque converter. Torque converter pressure (91) is applied to the right side of the torque converter to engage the lock-up clutch. The PCM also controls A/T clutch pressure control solenoid valve C, and LS C pressure (58) is applied to the lock-up control valve and the lock-up timing valve. When LS C pressure (58) is lower, torque converter pressure (91) from the lock-up timing valve is lower. The lock-up clutch is engaged partially. LS C pressure (58) increases, and the lock-up timing valve is moved to the left side to uncover the port leading torque converter pressure to high. The lock-up clutch is then engaged securely. Under this condition, the lock-up clutch is engaged by pressure from the right side of the torque converter; this lock-up condition is partial lock-up.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



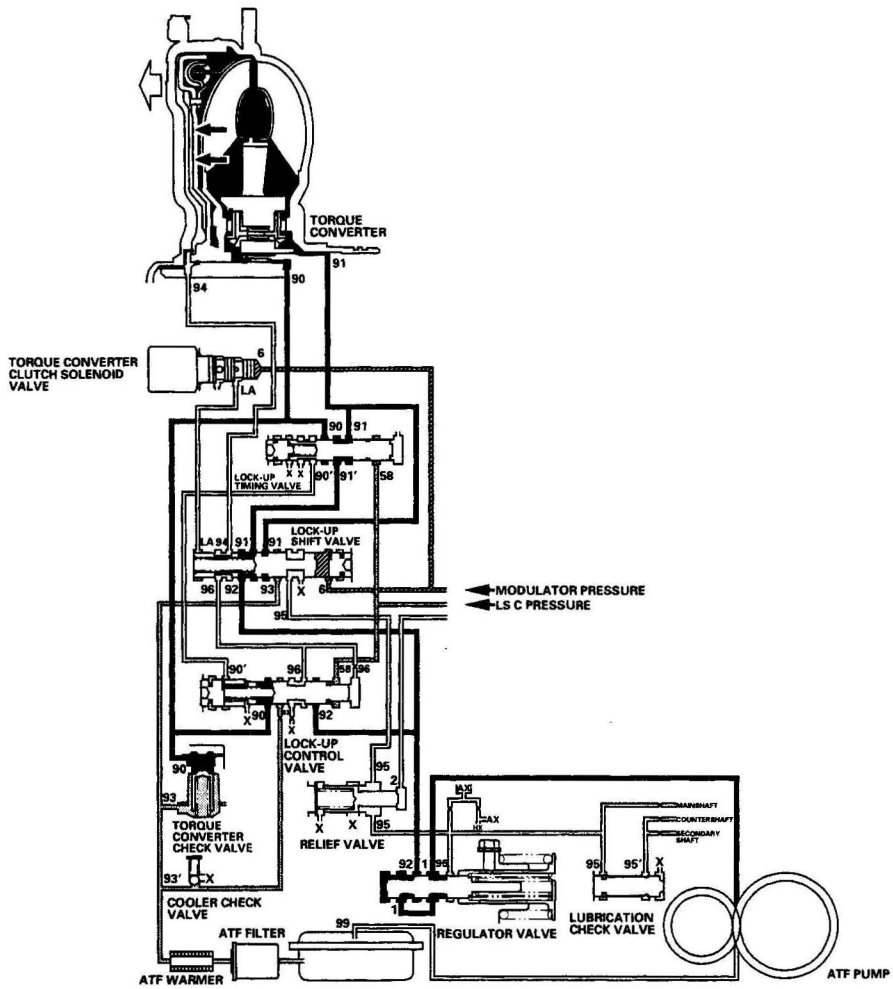
BACK

Protected by AR

Full Lock-up

When the vehicle speed further increases, the PCM controls A/T clutch pressure control solenoid valve C to increase LS C pressure (58). The LS C pressure (58) is applied to the lock-up control valve and the lock-up timing valve, and moves them to the left side. Under this condition, torque converter back pressure (F2) is released fully, causing the lock-up clutch to be fully engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

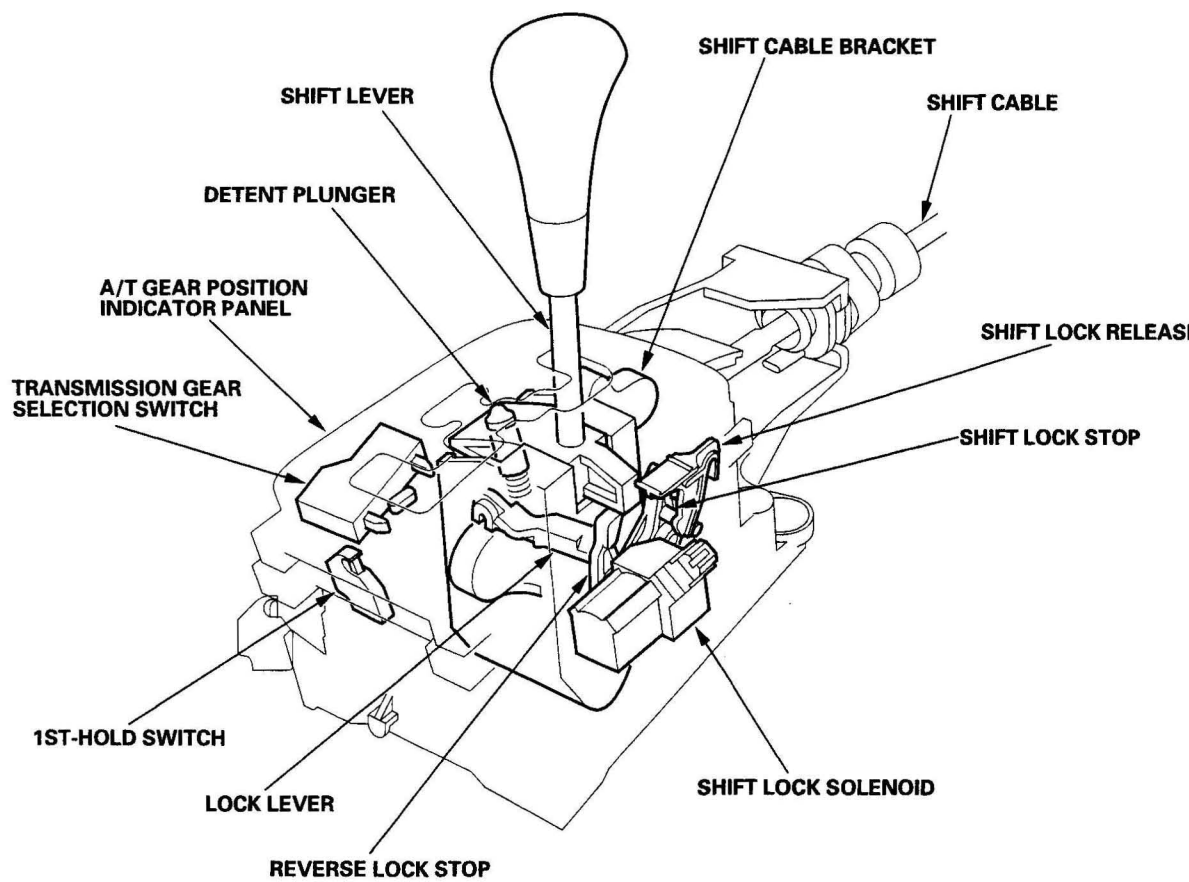
BACK

Protected by AR

System Description (cont'd)

Shift Lever/Sequential Sportshift Mode Mechanism
The shift lever has nine positions: P, R, N, D5, D4, D3, 2, 1 positions, and the sequential sportshift mode position. The shift lever shifts between positions along the gate in the A/T gear position indicator panel. The shift lever can shift out of the P position and into the R position without pressing the shift lever. The shift lock/reverse lock mechanism is an additional shift lever lockout mechanism.
The shift lever is engaged with the shift cable bracket in P, R, N, D5, D4, D3, 2, and 1. This unit shifts the transmission using the shift cable connected between the shift cable bracket and the transmission control shaft.

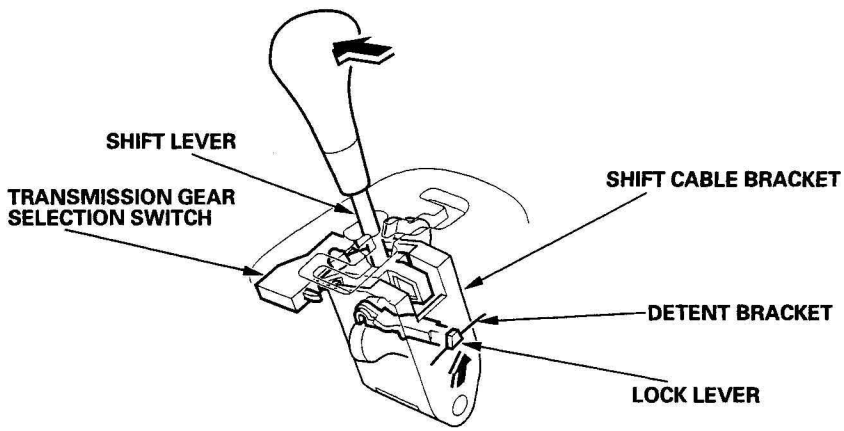
In the sequential sportshift mode position, the shift lever is disengaged from the cable bracket, and the shift lever can be used to shift gears electronically between 1st through 5th, much like a manual transmission.



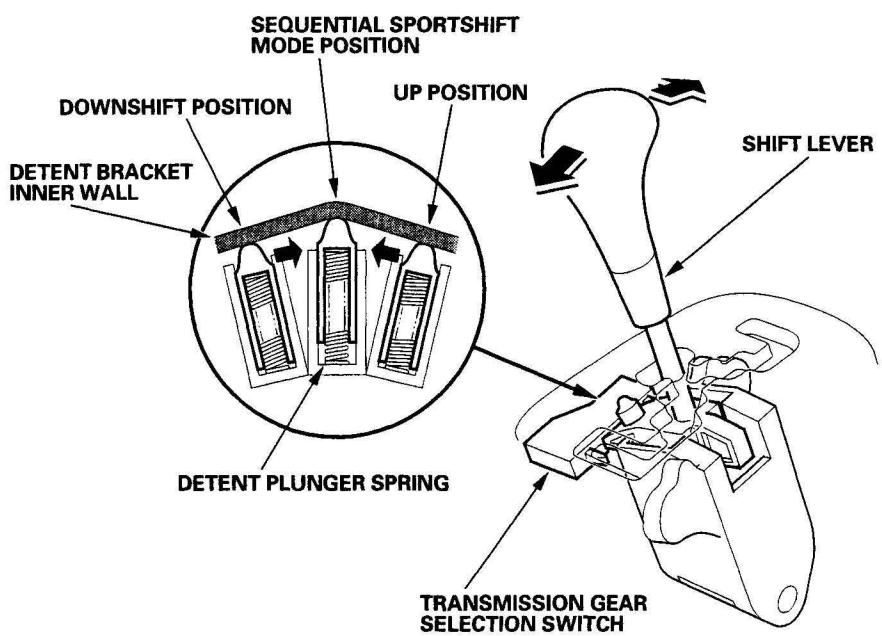
BACK

Protected by AR

When the shift lever shifts to the sequential sportshift mode position, the lock lever is released, and it pops up to engage the shift cable bracket to the detent bracket; the shift cable bracket and the shifting positions in the transmission are held in the Ds position.
The lock lever receives its spring load, pops up in the sequential sportshift mode position, and is pressed by the shift lever and does not engage the shift cable bracket to the shift lever base bracket in any position except sequential sportshift mode.



The shift lever fits into the sequential sportshift mode position by using a detent plunger with a spring. When shifting up or down, the detent plunger is pressed by the detent bracket inner wall, and the detent plunger spring puts the shift lever back into the neutral position. The detent plunger also works in the P position.



(cont'd)

Protected by AR

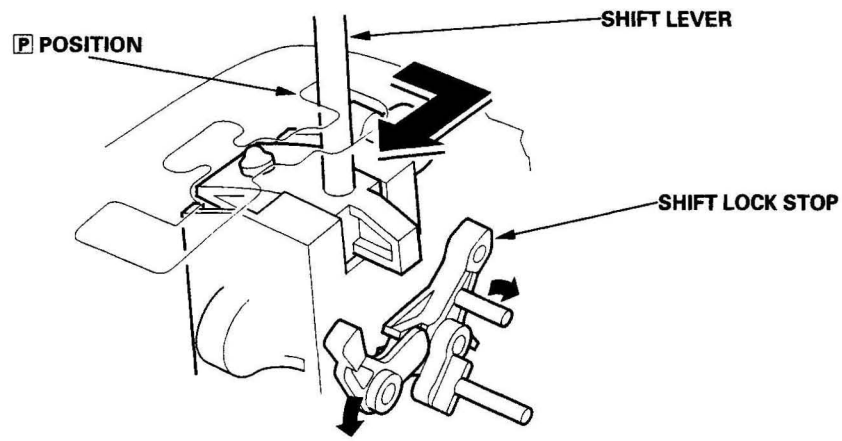
System Description (cont'd)

Shift Lock/Reverse Lock Mechanism

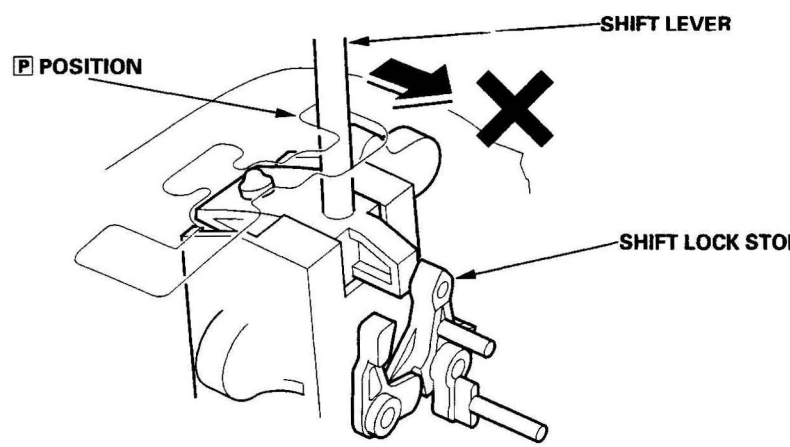
The shift lock system reduces the risk of unintentional engine starting. Starting the engine is possible only in the [P] and [N] positions. The shift lock system and the key interlock system make up the interlock control system. The key interlock mechanism is located in the steering lock assembly.

The shift lock mechanism consists of the shift lock solenoid, shift lock stop, shift lock release, and related parts. The reverse lock mechanism shares the shift lock solenoid with the shift lock mechanism. The reverse lock stop and the shift lock stop are interlocked with the shift lock solenoid operation. The shift lock solenoid is electronically controlled by these shift lock control system signals: brake pedal position switch signal, interlock control signal, and transmission range switch [P] position signal. If the shift lock solenoid does not operate, the shift lock/reverse lock mechanism can be released by depressing the shift lock release.

In the [P] position while pressing the brake pedal, the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the shift lock stop. This allows the shift lever to be moved.



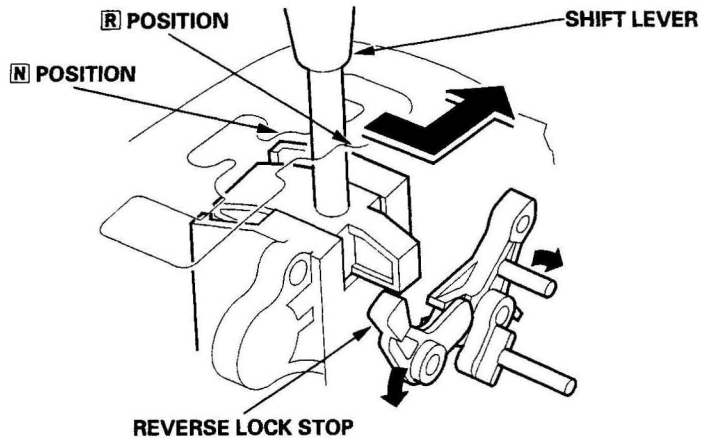
When the brake pedal is released, the shift lock solenoid remains OFF, and the shift lock stop locks to block the shift lever in the [P] position.



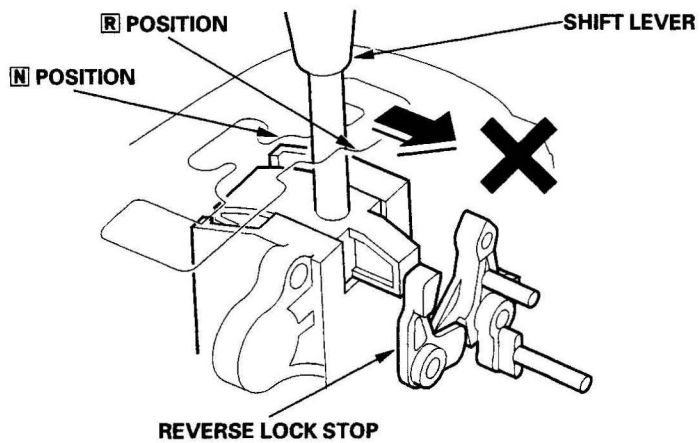
BACK

Protected by AR

When the shift lever is shifted to the R position from the D5 position and the N position (under certain conditions), the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the reverse lock stop. This allows the shift lever to be moved to the R position.



If the allowable conditions of turning ON the solenoid are not met, the shift lock solenoid remains OFF, and the reverse lock stop locks to block the shift lever in the N position.



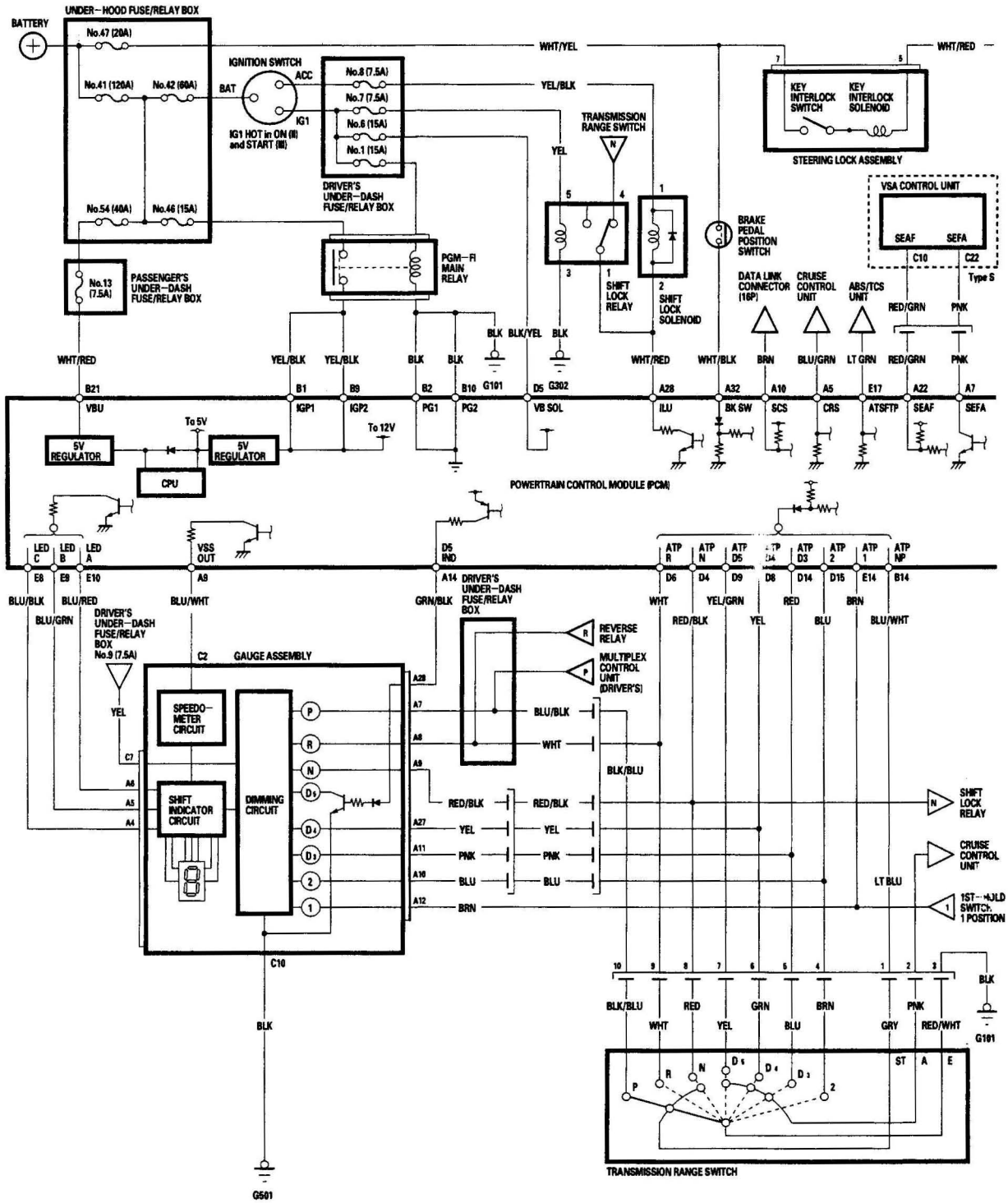
(cont'd)

BACK

Protected by AR

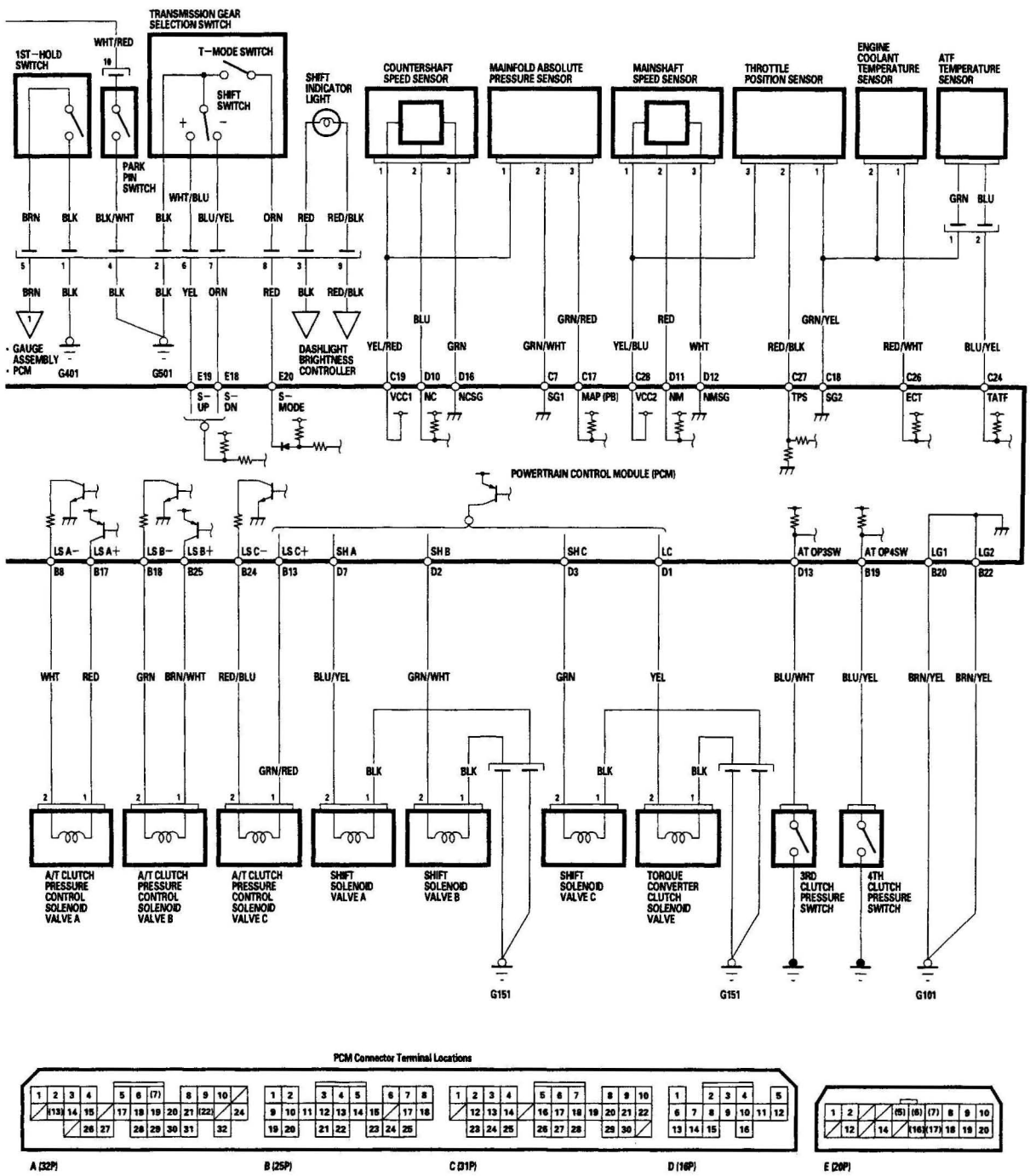
System Description (cont'd)

Circuit Diagram



BACK

Protected by AR



BACK

Protected by AR

DTC Troubleshooting

DTC P0710: A Problem in ATF Temperature Sensor Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Check whether the OBD II scan tool indicates a code for the fuel and emissions system.

   Does the OBD II scan tool indicate a code for the fuel and emissions system?

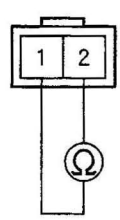
   YES – Perform the troubleshooting flowchart for the fuel and emissions system code. Recheck for code P0710 after troubleshooting. ■

   NO – Go to step 2.

2. Disconnect the 2P connector from the ATF temperature sensor harness.

3. Measure ATF temperature sensor resistance at the sensor connector.

   ATF TEMPERATURE SENSOR CONNECTOR



   Terminal side of male terminals

   Is the resistance 50 Ω – 2.5 kΩ ?

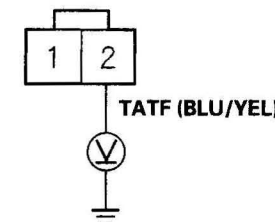
   YES – Go to step 4.

   NO – Replace the ATF temperature sensor. ■

4. Turn the ignition ON (II).

5. Measure the voltage between the No. 2 terminal of the ATF temperature sensor connector and body ground.

   ATF TEMPERATURE SENSOR CONNECTOR



   Wire side of female terminals

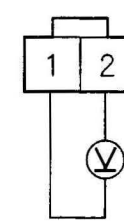
   Is there about 5 V?

   YES – Go to step 6.

   NO – Go to step 7.

6. Measure the voltage between the No. 1 and No. 2 terminals of the ATF temperature sensor connector.

   ATF TEMPERATURE SENSOR CONNECTOR



   Wire side of female terminals

   Is there about 5 V?

   YES – Check for loose terminal fit at the PCM connectors C24, C18 and at the ATF Temperature sensor. If necessary, substitute a known-good PCM and recheck. If the DTC recurs, substitute a known-good ATF temperature sensor. ■

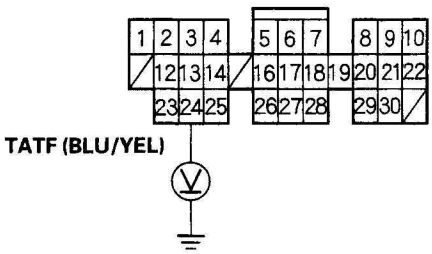
   NO – Repair open in the wire between the C18 terminal and the ATF temperature sensor. ■

BACK

Protected by AR

7. Measure the voltage between PCM connector terminal C24 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there about 5 V?

YES – Repair open in the wire between PCM connector terminal C24 and the ATF temperature sensor. ■

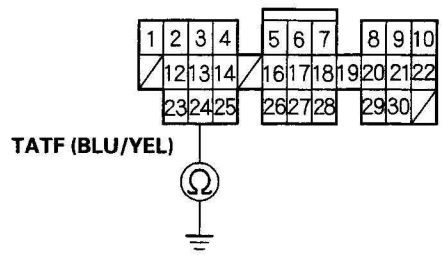
NO – Go to step 8.

8. Turn the ignition switch OFF.

9. Disconnect PCM connector C (31P).

10. Check for continuity between PCM connector terminal C24 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal C24 and the ATF temperature sensor. ■

NO – Check for loose terminal fit in the PCM connectors C24 and C18. If necessary, substitute a known-good PCM or ATF temperature sensor and recheck. ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0715: A Problem in Mainshaft Speed Sensor Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

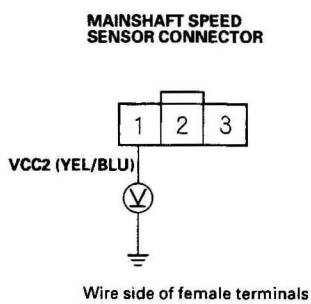
Code P0715 (15) doesn't always mean there's an electrical problem in the mainshaft or countershaft speed sensor circuit; code P0715 (15) may also indicate a mechanical problem in the transmission. Any problem causing irregular countershaft-to-mainshaft speed difference can cause this code.

1. Turn the ignition switch ON (II).
2. Check whether the OBD II scan tool indicates the code for the throttle position (TP) sensor or the engine coolant temperature (ECT) sensor.

   Does the OBD II scan tool indicate the code for the TP sensor or the ECT sensor?

   YES—Perform the troubleshooting flowchart for the TP sensor (see page 11-104) or the ECT sensor (see page 11-101). Recheck for code P0715 after troubleshooting.■

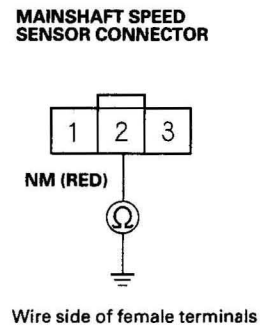
   NO—Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the mainshaft speed sensor connector.
5. Turn the ignition switch ON (II).
6. Measure the voltage between the No. 1 terminal of the mainshaft speed sensor connector and body ground.



   Is there about 5 V?

   YES—Go to step 7.

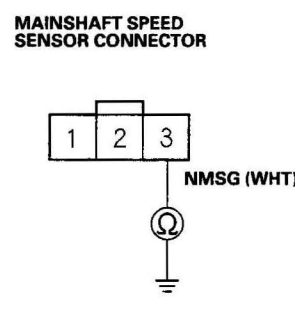
   NO—Go to step 15.
7. Turn the ignition switch OFF.
8. Disconnect the PCM connector D (16P).
9. Check for continuity between the No. 2 terminal of the mainshaft speed sensor connector and body ground.



   Is there continuity?

   YES—Repair short to ground in the wire between PCM connector terminal D11 and the mainshaft speed sensor connector.■

   NO—Go to step 10.
10. Reconnect the PCM connector D (16P).
11. Check for continuity between the No. 3 terminal of the mainshaft speed sensor connector and body ground.



   Is there continuity?

   YES—Go to step 12.

   NO—Repair open in the wire between PCM connector terminal D12 and the mainshaft speed sensor.■

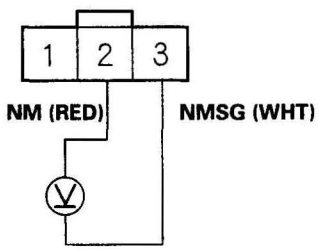
BACK

Protected by AR

12. Turn the ignition switch ON (II).

13. Measure the voltage between the No. 2 and No. 3 terminals of the mainshaft speed sensor connector.

MAINSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

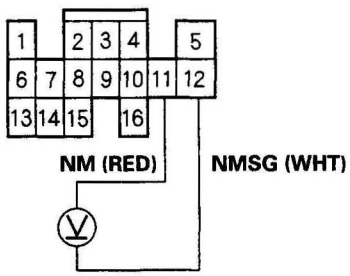
Is there about 5 V?

YES – Go to step 21.

NO – Go to step 14.

14. Measure the voltage between PCM connector terminals D11 and D12.

PCM CONNECTOR D (16P)



Wire side of female terminals

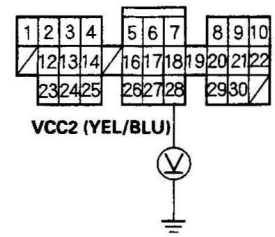
Is there about 5 V?

YES – Repair open in the wire between PCM connector terminal D11 and the mainshaft speed sensor. ■

NO – Check for loose terminal fit in the PCM connectors D11, D12 and C28. If necessary, substitute a known-good PCM and recheck. ■

15. Measure the voltage between PCM connector terminal C28 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there 4.75 – 5.25 V?

YES – Repair open in the wire between PCM connector terminal C28 and the mainshaft speed sensor. ■

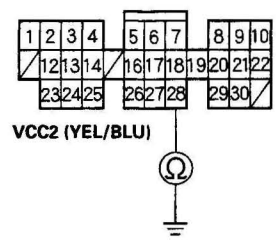
NO – Go to step 16.

16. Turn the ignition switch OFF.

17. Disconnect PCM connector C (31P).

18. Check for continuity between PCM connector terminal C28 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal C28 and the mainshaft speed sensor. ■

NO – Check for loose terminal fit in the PCM connectors D11, D12 and C28. If necessary, substitute a known-good PCM and recheck. ■

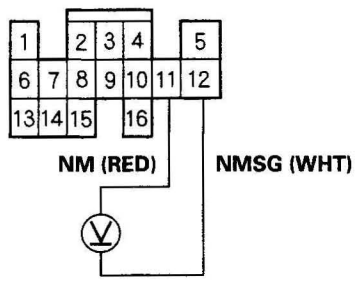
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

19. Connect the mainshaft speed sensor connector.
20. Measure the voltage between PCM connector terminals D11 and D12.

PCM CONNECTOR D (16P)



Wire side of female terminals

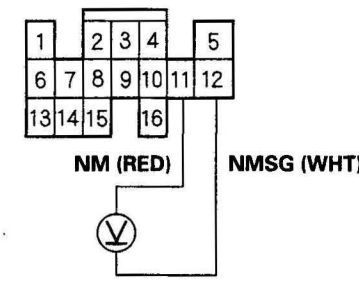
Is there about 5 V or 0 V?

YES – Go to step 21.

NO – Replace the mainshaft speed sensor. ■

21. Start the engine, and run it at idle in the [P] position.
22. Hold the engine at idle, and measure the voltage between PCM connector terminals D11 and D12.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is there 1.5 – 3.5 V?

YES – Check for loose terminal fit in the PCM connectors D11, D12 and C28. If necessary, substitute a known-good PCM and recheck. ■

NO – Replace the mainshaft speed sensor. ■

BACK

Protected by AR

DTC P0720: A Problem in Countershaft Speed Sensor Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

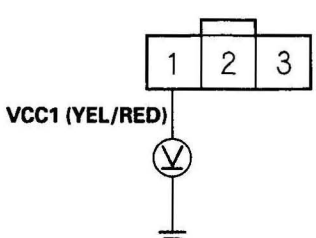
1. Turn the ignition switch ON (II).
2. Check whether the OBD II scan tool indicates the code for the manifold absolute pressure (MAP) sensor.

   Does the OBD II scan tool indicate the code for the MAP sensor?

   YES – Perform the troubleshooting flowchart for the MAP sensor (see page 11-96). Recheck for code P0720 after troubleshooting. ■

   NO – Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the countershaft speed sensor connector.
5. Turn the ignition switch ON (II).
6. Measure the voltage between the No. 1 terminal of the countershaft speed sensor connector and body ground.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

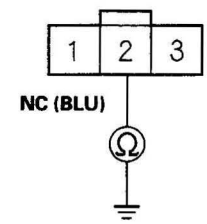
Is there about 5 V?

YES – Go to step 7.

NO – Go to step 15.

7. Turn the ignition switch OFF.
8. Disconnect PCM connector D (16P).
9. Check for continuity between the No. 2 terminal of the countershaft speed sensor connector and body ground.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

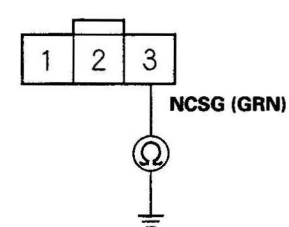
Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal D10 and the countershaft speed sensor. ■

NO – Go to step 10.

10. Reconnect PCM connector D (16P).
11. Check for continuity between the No. 3 terminal of the countershaft speed sensor connector and body ground.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Go to step 12.

NO – Repair open in the wire between PCM connector terminal D16 and the countershaft speed sensor. ■

(cont'd)

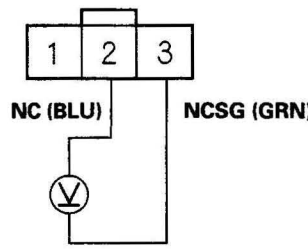
Protected by AR

DTC Troubleshooting (cont'd)

12. Turn the ignition switch ON (II).

13. Measure the voltage between the No. 2 and No. 3 terminals of the countershaft speed sensor connector.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

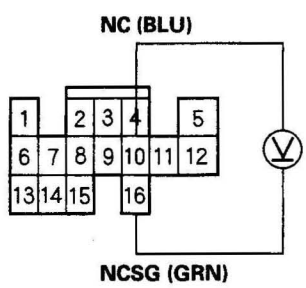
Is there about 5 V?

YES – Go to step 16.

NO – Go to step 14.

14. Measure the voltage between PCM connector terminals D10 and D16.

PCM CONNECTOR D (16P)



Wire side of female terminals

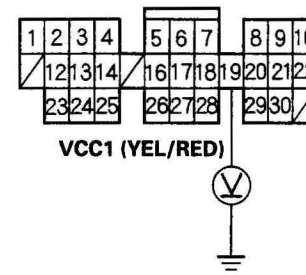
Is there about 5 V?

YES – Repair open in the wire between PCM connector terminal D10 and the countershaft speed sensor. ■

NO – Check for loose terminal fit in the PCM connectors D10, D16 and C19. If necessary, substitute a known-good PCM and recheck. ■

15. Measure the voltage between PCM connector terminal C19 and body ground.

PCM CONNECTOR C (31P)



Wire side of female terminals

Is there 4.75 – 5.25 V?

YES – Repair open in the wire between PCM connector terminal C19 and the countershaft speed sensor connector. ■

NO – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

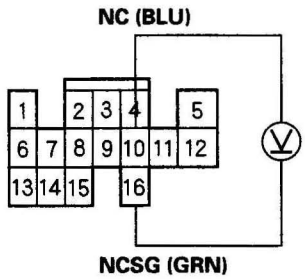
BACK

Protected by AR

16. Connect the countershaft speed sensor connector.

17. Measure the voltage between PCM connector terminals D10 and D16.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is there about 5 V or 0 V?

YES – Go to step 18.

NO – Replace the countershaft speed sensor. ■

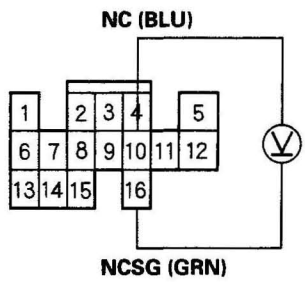
18. Raise the front of the vehicle, and make sure it is securely supported.

19. Set the parking brake, and block both rear wheels securely.

20. Start the engine, then shift to the D position and drive the vehicle.

21. Measure the voltage between PCM connector terminals D10 and D16.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is there 1.5 – 3.5 V?

YES – Check for loose terminal fit in the PCM connectors D10, D16 and C19. If necessary, substitute a known-good PCM and recheck. ■

NO – Replace the countershaft speed sensor. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0730: Problem in Shift Control System

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Shift solenoid valves A, B, and C
  - A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES—Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P0730 after troubleshooting. ■

   NO—Go to step 2.

   NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

2. Measure the 1st, 2nd, 3rd, 4th, and 5th clutch pressure (see page 14-338).

   Is each clutch pressure within the service limit?

   YES—Go to step 3.

   NO—Repair the hydraulic system as necessary. ■

3. Replace the shift solenoid valve B (see page 14-341).

4. Replace the shift solenoid valves A and C (see page 14-342).

5. Replace the A/T clutch pressure control solenoid valves A and B (see page 14-344).

6. Turn the ignition switch OFF, and reset the PCM memory by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

7. Calibrate the engine idle control system in the pcm (see page 11-158), and drive the vehicle at a speed over 12 mph (20 km/h) in 1st, 2nd, 3rd, 4th, and 5th gear in the D5 position for more than 30 seconds.

8. Recheck for code P0730.

   Does the OBD II scan tool indicate code P0730?

   YES—Replace the transmission. ■

   NO—The system is OK at this time. ■

BACK

Protected by AR

DTC P0740: Problem in Lock-up Control System

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Torque converter clutch solenoid valve
  - A/T clutch pressure control solenoid valve C

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES – Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P0740 after troubleshooting. ■

   NO – Go to step 2.

   NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

2. Measure the line pressure (see page 14-338).

   Is the line pressure within the service limit?

   YES – Go to step 3.

   NO – Repair the hydraulic system as necessary (see page 14-338). ■

3. Replace the torque converter clutch solenoid valve (see page 14-340).

4. Replace the A/T clutch pressure control solenoid valve C (see page 14-346).

5. Turn the ignition switch OFF, and reset the PCM memory by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

6. Using the scan tool, check to be sure that the engine coolant temperature is 176°F (80°C) or above.

7. Calibrate the engine idle control system in the PCM (see page 11-158), and drive the vehicle at 55 mph (88 km/h) for more than one minute.

8. Recheck for code P0740.

   Does the OBD II scan tool indicate code P0740?

   YES – Replace the transmission and torque converter. ■

   NO – The system is OK at this time. ■

Protected by AR

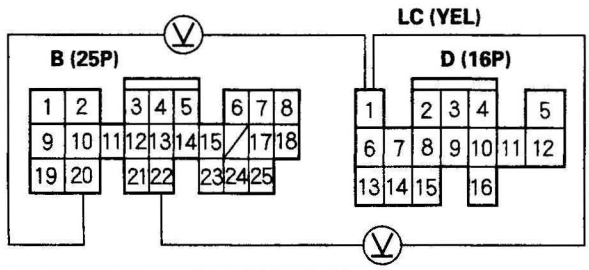
DTC Troubleshooting (cont'd)

DTC P0743: Premium
DTC P1753: Type S
Problem in Torque Converter Clutch Solenoid Valve Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect PCM connectors B (25P) and D (16P).
3. Turn the ignition switch ON (II).
4. Measure the voltage between PCM connector terminals D1 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

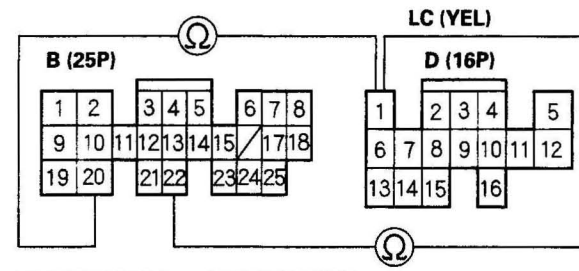
Is there voltage?

YES – Repair short to power in the wire between PCM connector terminal D1 and the torque converter clutch solenoid valve. ■

NO – Go to step 5.

5. Turn the ignition switch OFF.
6. Measure the resistance between PCM connector terminals D1 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

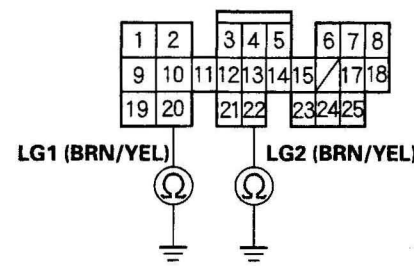
Is the resistance 12–25 Ω ?

YES – Go to step 11.

NO – Go to step 7.

7. Check for continuity between PCM connector terminal B20 and body ground, and between B22 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Go to step 8.

NO – Repair open in the wires between PCM connector terminals B20, B22 and ground (G101). Repair poor ground (G101). ■

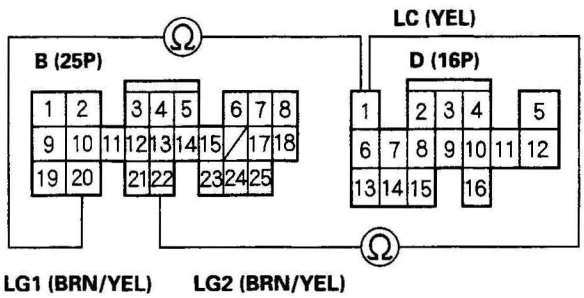
BACK

Protected by AR

8. Disconnect the 2P connector from the torque converter clutch solenoid valve.

9. Check for continuity between PCM connector terminals D1 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

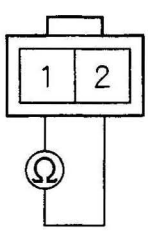
Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal D1 and the torque converter clutch solenoid valve. ■

NO – Go to step 10.

10. Measure torque converter clutch solenoid valve resistance at the solenoid valve connector.

TORQUE CONVERTER CLUTCH SOLENOID VALVE CONNECTOR



Terminal side of male terminals

Is the resistance 12 – 25 Ω ?

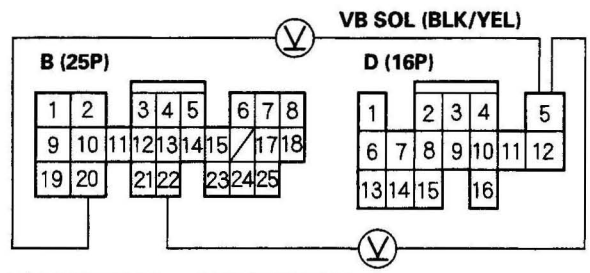
YES – Check for an open in the wires between PCM connector terminal D1 and the torque converter clutch solenoid valve, and between the No. 1 terminal of the torque converter clutch solenoid valve connector and ground (G151). ■

NO – Replace the torque converter clutch solenoid valve. ■

11. Turn the ignition switch ON (II).

12. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in the PCM connectors D5 and D1. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

Protected by AR

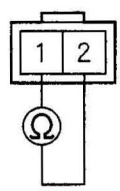
DTC Troubleshooting (cont'd)

DTC P0748: Premium
DTC P1768: Type S
Problem in A/T Clutch Pressure Control Solenoid Valve A Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Disconnect the 2P connector from A/T clutch pressure control solenoid valve A.
2. Measure A/T clutch pressure control solenoid resistance at the solenoid valve connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Terminal side of male terminals

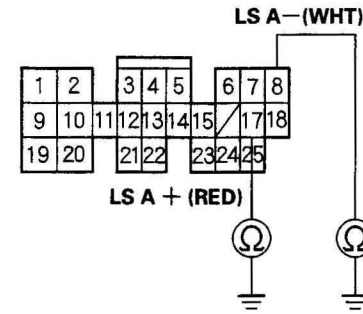
Is the resistance about 5 Ω ?

YES—Go to step 3.

NO—Replace the A/T clutch pressure control solenoid valves A and B.■

3. Disconnect PCM connector B (25P).
4. Check for continuity between body ground and PCM connector terminals B8 and B17 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

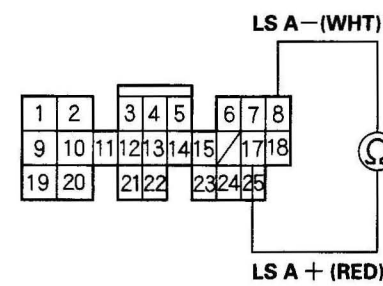
Is there continuity?

YES—Repair short to ground in the wires between PCM connector terminals B8, B17 and A/T clutch pressure control solenoid valve A.■

NO—Go to step 5.

5. Connect the A/T clutch pressure control solenoid valve A connector.
6. Measure the resistance between PCM connector terminals B8 and B17.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is the resistance about 5 Ω ?

YES—Go to step 7.

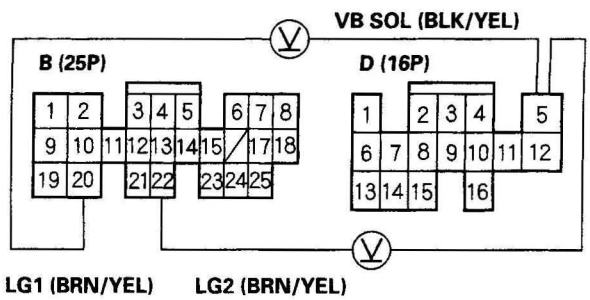
NO—Repair loose terminal or open in the wires between PCM connector terminals B8, B17 and A/T clutch pressure control solenoid valve A.■

BACK

Protected by AR

7. Disconnect PCM connector D (16P).
8. Turn the ignition switch ON (II).
9. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in PCM connectors B8, B17 and D5. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminals D5 and the driver's under-dash fuse/relay box, and between B20, B22 and ground (G101). ■

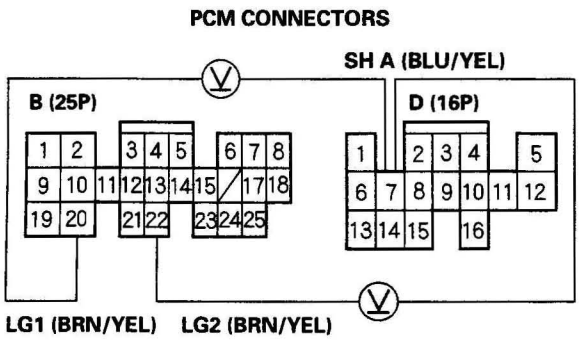
Protected by AR

DTC Troubleshooting (cont'd)

DTC P0753: Problem in Shift Solenoid Valve A Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect PCM connectors B (25P) and D (16P).
3. Turn the ignition switch ON (II).
4. Measure the voltage between PCM connector terminals D7 and B20 or B22.



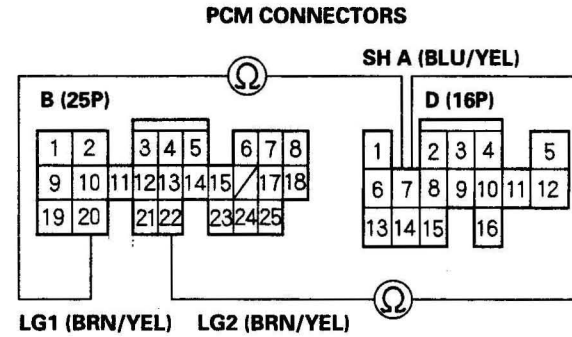
Wire side of female terminals

Is there voltage?

YES—Repair short to power in the wire between PCM connector terminal D7 and the shift solenoid valve A.■

NO—Go to step 5.

5. Turn the ignition switch OFF.
6. Measure the resistance between PCM connector terminals D7 and B20 or B22.



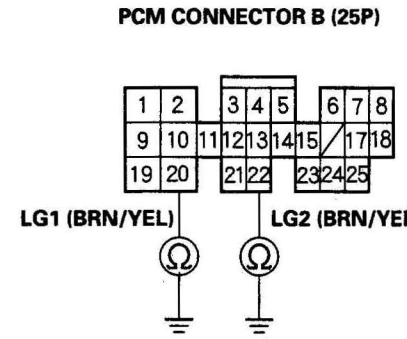
Wire side of female terminals

Is the resistance 12—25 Ω ?

YES—Go to step 11.

NO—Go to step 7.

7. Check for continuity between PCM connector terminal B20 and body ground, and between B22 and body ground.



Wire side of female terminals

Is there continuity?

YES—Go to step 8.

NO—Repair open in the wires between PCM connector terminals B20, B22 and ground (G101). Repair poor ground (G101).■

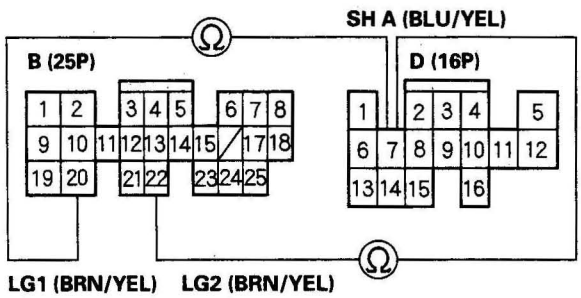
BACK

Protected by AR

8. Disconnect the 2P connector from shift solenoid valve A.

9. Check for continuity between PCM connector terminals D7 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

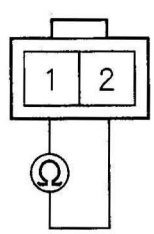
Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal D7 and shift solenoid valve A. ■

NO – Go to step 10.

10. Measure shift solenoid valve A resistance at the solenoid valve connector.

SHIFT SOLENOID VALVE A CONNECTOR



Terminal side of male terminals

Is the resistance 12 – 25 Ω ?

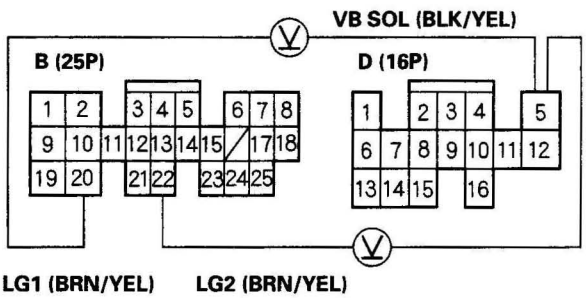
YES – Check for an open in the wire between PCM connector terminal D7 and shift solenoid valve A, and between the No. 1 terminal of the shift solenoid valve A connector and ground (G151). ■

NO – Replace shift solenoid valve A. ■

11. Turn the ignition switch ON (II).

12. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in the PCM connectors D5 and D7. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

Protected by AR

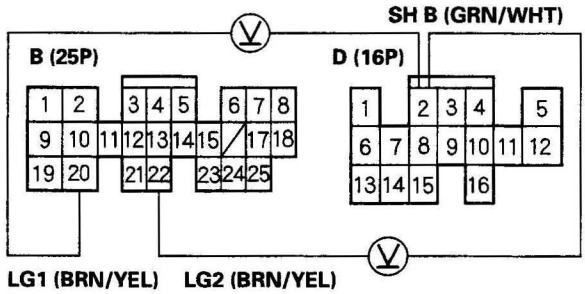
DTC Troubleshooting (cont'd)

DTC P0758: Problem in Shift Solenoid Valve B Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect PCM connectors B (25P) and D (16P).
3. Turn the ignition switch ON (II).
4. Measure the voltage between PCM connector terminals D2 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

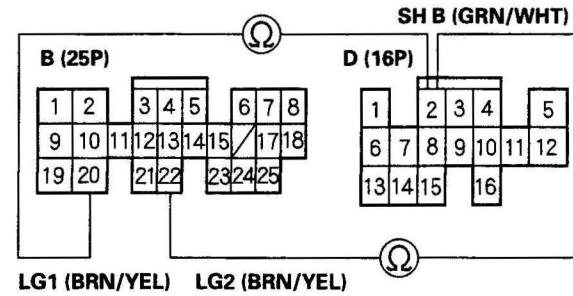
Is there voltage?

YES – Repair short to power in the wire between PCM connector terminal D2 and the shift solenoid valve B.■

NO – Go to step 5.

5. Turn the ignition switch OFF.
6. Measure the resistance between PCM connector terminals D2 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

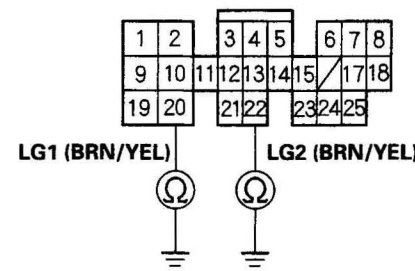
Is the resistance 12–25 Ω?

YES – Go to step 11.

NO – Go to step 7.

7. Check for continuity between PCM connector terminal B20 and body ground, and between B22 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Go to step 8.

NO – Repair open in the wires between PCM connector terminals B20, B22 and ground (G101). Repair poor ground (G101).■

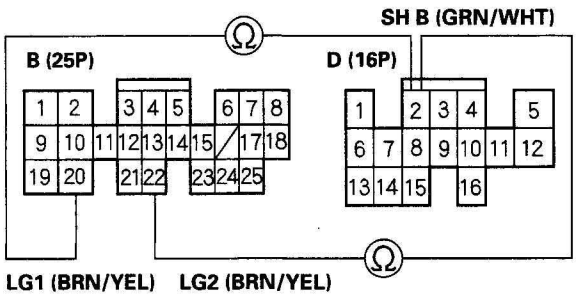
BACK

Protected by AR

8. Disconnect the 2P connector from shift solenoid valve B.

9. Check for continuity between PCM connector terminals D2 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

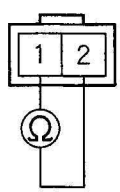
Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal D2 and shift solenoid valve B. ■

NO – Go to step 10.

10. Measure shift solenoid valve B resistance at the solenoid valve connector.

SHIFT SOLENOID VALVE B CONNECTOR



Terminal side of male terminals

Is the resistance 12 – 25 Ω ?

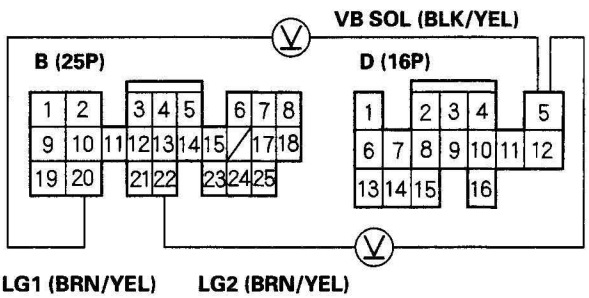
YES – Check for an open in the wires between PCM connector terminal D2 and the shift solenoid valve B, and between the No. 1 terminal of the shift solenoid valve B connector and ground (G151). ■

NO – Replace shift solenoid valve B. ■

11. Turn the ignition switch ON (II).

12. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in the PCM connectors D5 and D2. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

BACK

Protected by AR

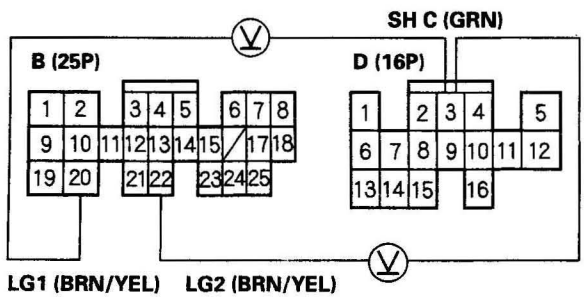
DTC Troubleshooting (cont'd)

DTC P0763: Problem in Shift Solenoid Valve C Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect PCM connectors B (25P) and D (16P).
3. Turn the ignition switch ON (II).
4. Measure the voltage between PCM connector terminals D3 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

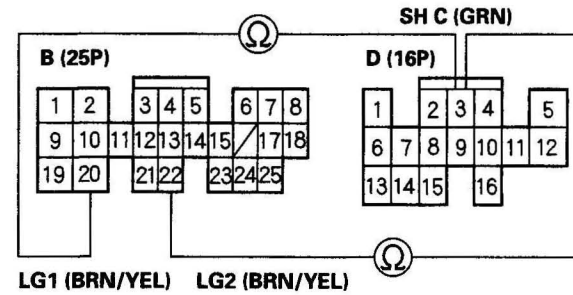
Is there voltage?

YES – Repair short to power in the wire between PCM connector terminal D3 and shift solenoid valve C.■

NO – Go to step 5.

5. Turn the ignition switch OFF.
6. Measure the resistance between PCM connector terminals D3 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

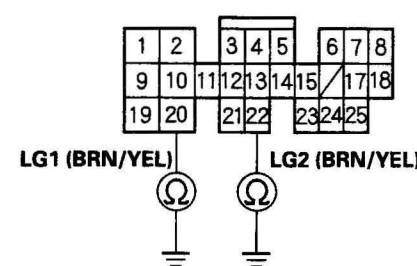
Is the resistance 12–25 Ω ?

YES – Go to step 11.

NO – Go to step 7.

7. Check for continuity between PCM connector terminal B20 and body ground, and between B22 and body ground.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Go to step 8.

NO – Repair open in the wires between PCM connector terminals B20, B22 and ground (G101). Repair poor ground (G101).■

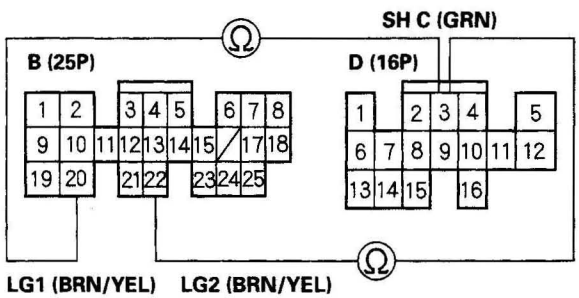
BACK

Protected by AR

8. Disconnect the 2P connector from shift solenoid valve C.

9. Check for continuity between PCM connector terminals D3 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

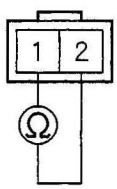
Is there continuity?

YES — Repair short to ground in the wire between PCM connector terminal D3 and shift solenoid valve C. ■

NO — Go to step 10.

10. Measure shift solenoid valve C resistance at the solenoid valve connector.

SHIFT SOLENOID VALVE C CONNECTOR



Terminal side of male terminals

Is the resistance 12 — 25 Ω ?

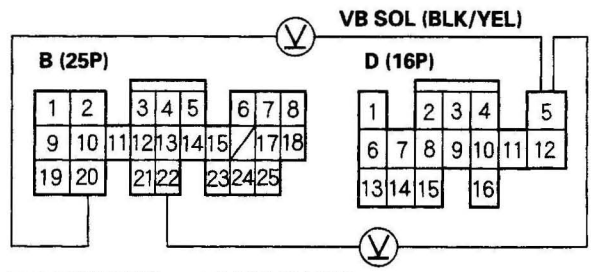
YES — Check for an open in the wires between PCM connector terminal D3 and shift solenoid valve C, and between the No. 1 terminal of the shift solenoid valve C connector and ground (G151). ■

NO — Replace shift solenoid valve C. ■

11. Turn the ignition switch ON (II).

12. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES — Check for loose terminal fit in the PCM connectors D5 and D3. If necessary, substitute a known-good PCM and recheck. ■

NO — Check for blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminal D5 and the driver's under-dash fuse/relay box. ■

Protected by AR

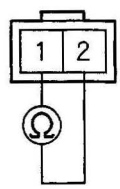
DTC Troubleshooting (cont'd)

DTC P0778: Premium
DTC P1773: Type S
Problem in A/T Clutch Pressure Control Solenoid Valve B Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Disconnect the 2P connector from A/T clutch pressure control solenoid valve B.
2. Measure A/T clutch pressure control solenoid resistance at the solenoid valve connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



Terminal side of male terminals

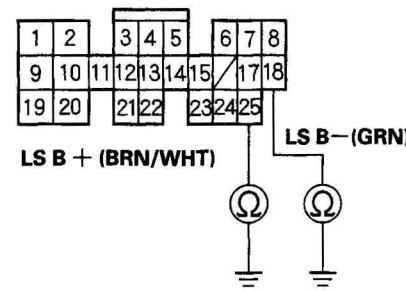
Is the resistance about 5 Ω ?

YES—Go to step 3.

NO—Replace the A/T clutch pressure control solenoid valves A and B.■

3. Disconnect PCM connector B (25P).
4. Check for continuity between body ground and PCM connector terminals B18 and B25 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

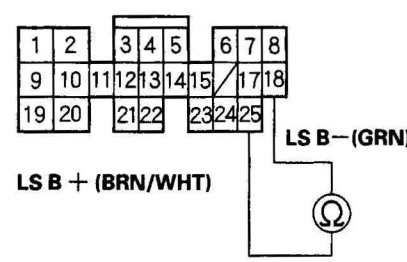
Is there continuity?

YES—Repair short to ground in the wires between PCM connector terminals B18, B25 and A/T clutch pressure control solenoid valve B.■

NO—Go to step 5.

5. Connect the A/T clutch pressure control solenoid valve B connector.
6. Measure the resistance between PCM connector terminals B18 and B25.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is the resistance about 5 Ω ?

YES—Go to step 7.

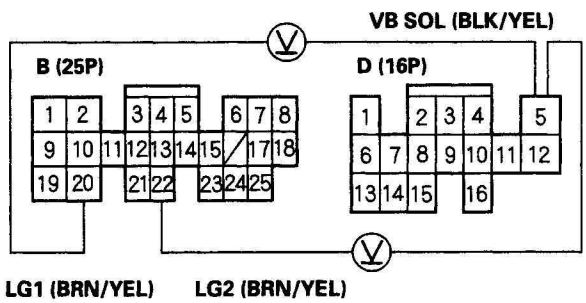
NO—Repair loose terminal or open in the wires between PCM connector terminals B18, B25 and A/T clutch pressure control solenoid valve B.■

BACK

Protected by AR

7. Disconnect PCM connector D (16P).
8. Turn the ignition switch ON (II).
9. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Check for loose terminal fit in PCM connectors B18, B25 and D5. If necessary, substitute a known-good PCM and recheck. ■

NO—Check for blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminals D5 and the driver's under-dash fuse/relay box, and between B20, B22 and ground (G101). ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC P0780: Mechanical Problem in Hydraulic Control System of Shift Solenoid Valve A and A/T Clutch Pressure Control Solenoid Valves A and B, or Problem in Hydraulic Control System

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Shift solenoid valve A
  - A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES—Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P0780 after troubleshooting. ■

   NO—Go to step 2.

2. Turn the ignition switch OFF.

3. Replace the shift solenoid valve A (see page 14-342).

4. Replace the A/T clutch pressure control solenoid valves A and B (see page 14-344).

5. Reset the PCM memory by removing the BACK UP fuse in the passenger's under-dash fuse/relay box for more than 10 seconds.

6. Calibrate the engine control system in the PCM (see page 11-158), and drive the vehicle for several minutes in 1st, 2nd, 3rd, 4th, and 5th gears in the D5 position.

7. Recheck for code P0780.

   Does the OBD II scan tool indicate code P0780?

   YES—Replace the transmission. ■

   NO—The problem has been corrected. ■

BACK

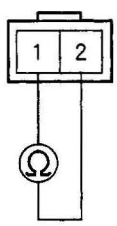
Protected by AR

DTC P0798: Premium
DTC P1778: Type S
Problem in A/T Clutch Pressure Control Solenoid Valve C Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Disconnect the 2P connector from A/T clutch pressure control solenoid valve C.
2. Measure A/T clutch pressure control solenoid resistance at the solenoid valve connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CONNECTOR



Terminal side of male terminals

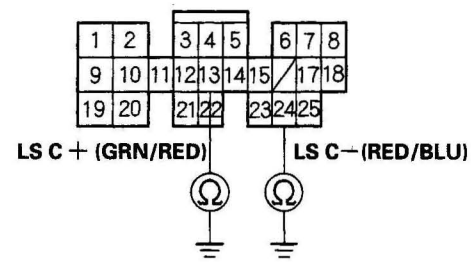
Is the resistance about 5 Ω ?

YES – Go to step 3.

NO – Replace A/T clutch pressure control solenoid valve C. ■

3. Disconnect PCM connector B (25P).
4. Check for continuity between body ground and PCM connector terminals B13 and B24 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

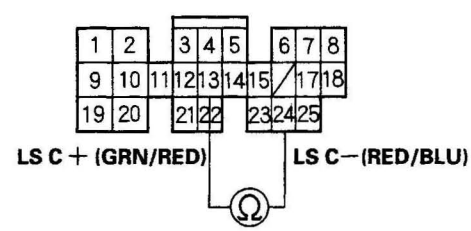
Is there continuity?

YES – Repair short to ground in the wires between PCM connector terminals B13, B24 and A/T clutch pressure control solenoid valve C. ■

NO – Go to step 5.

5. Connect the A/T clutch pressure control solenoid valve C connector.
6. Measure the resistance between PCM connector terminals B13 and B24.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is the resistance about 5 Ω ?

YES – Go to step 7.

NO – Repair loose terminal or open in the wires between PCM connector terminals B13, B24 and A/T clutch pressure control solenoid valve C. ■

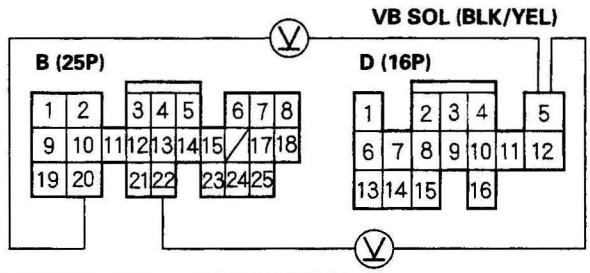
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Disconnect PCM connector D (16P).
8. Turn the ignition switch ON (II).
9. Measure the voltage between PCM connector terminals D5 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Check for loose terminal fit in PCM connectors B13, B24 and D5. If necessary, substitute a known-good PCM and recheck. ■

NO – Check for blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between PCM connector terminals D5 and the driver's under-dash fuse/relay box, and between B20, B22 and ground (G101). ■

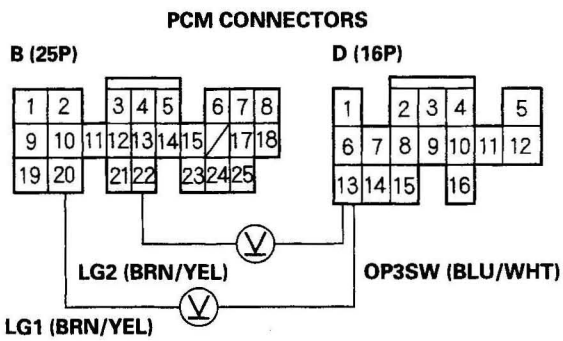
BACK

Protected by AR

DTC P0845: Premium
DTC P1739: Type S
Problem in 3rd Clutch Pressure Switch Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Measure the voltage between PCM connector terminals D13 and B20 or B22.



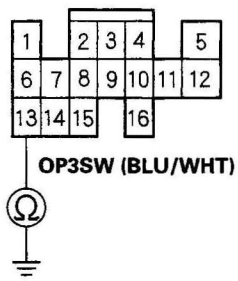
Wire side of female terminals

Is there battery voltage?

YES – Go to step 7.

NO – Go to step 3.

3. Turn the ignition switch OFF.
4. Disconnect PCM connector D (16P).
5. Disconnect the 3rd clutch pressure switch connector.
6. Check for continuity between PCM connector terminal D13 and body ground.



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal D13 and the 3rd clutch pressure switch. Check the pin fit of the PCM connector terminal D13. ■

NO – Go to step 15.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

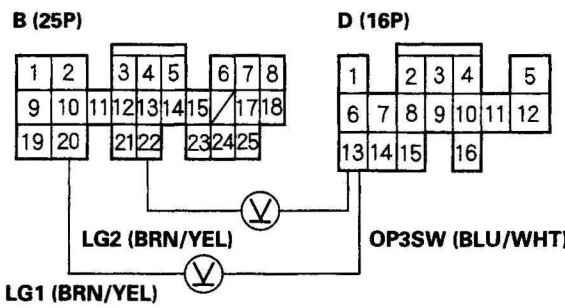
7. Raise the front of the vehicle, and make sure it is securely supported.

8. Set the parking brake, and block the rear wheels securely.

9. Start the engine, cancel the TCS or VSA (Type-S), then shift to D3 position and drive in 3rd gear for more than five seconds.

10. Measure the voltage between PCM connector terminals D13 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there about 0 V?

YES – Check for loose terminal fit in the PCM connectors D13. If necessary, substitute a known-good PCM and recheck. ■

NO – Go to step 11.

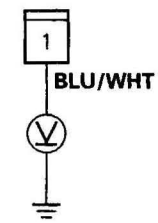
11. Turn the ignition switch OFF.

12. Disconnect the 3rd clutch pressure switch connector.

13. Turn the ignition switch ON (II).

14. Measure the voltage between the 3rd clutch pressure switch connector terminal and body ground.

3RD CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminal

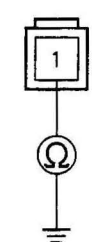
Is there battery voltage?

YES – Go to step 15.

NO – Repair open in the wire between the 3rd clutch pressure switch and the PCM. ■

15. Measure the resistance between the 3rd clutch pressure switch connector terminal and body ground.

3RD CLUTCH PRESSURE SWITCH CONNECTOR



Terminal side of male terminals

Is the resistance 10 MΩ and more?

YES – If necessary, substitute a known-good PCM and recheck. ■

NO – Replace the 3rd clutch pressure switch. ■

BACK

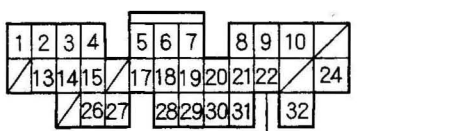
Protected by AR

DTC P1656: Problem in PCM-to-VSA Control Unit Communications Circuit (Type S only)

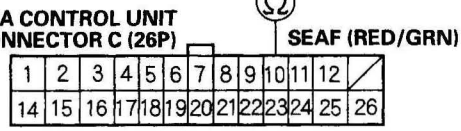
NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect PCM connector A (32P) and VSA control unit connector C (26P).
3. Check for continuity between PCM connector terminal A22 and VSA control unit connector terminal C10.

PCM CONNECTOR A (32P)



VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

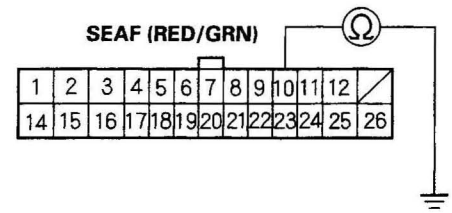
Is there continuity?

YES – Go to step 4.

NO – Repair open in the wire between PCM connector terminal A22 and VSA control unit connector terminal C10. ■

4. Check for continuity between VSA control unit connector terminal C10 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

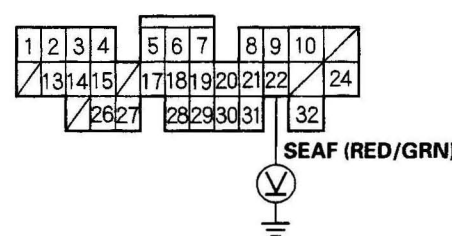
Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal A22 and VSA control unit connector terminal C10. ■

NO – Go to step 5.

5. Connect PCM connector A (32P).
6. Turn the ignition switch ON (II).
7. Check for voltage between PCM connector terminal A22 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there about 10 V?

YES – Check for loose terminal fit in PCM connector A22 and VSA control unit connector C10. If necessary, substitute a known-good PCM and recheck. ■

NO – Replace the PCM. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

DTC P1705: Short in Transmission Range Switch Circuit

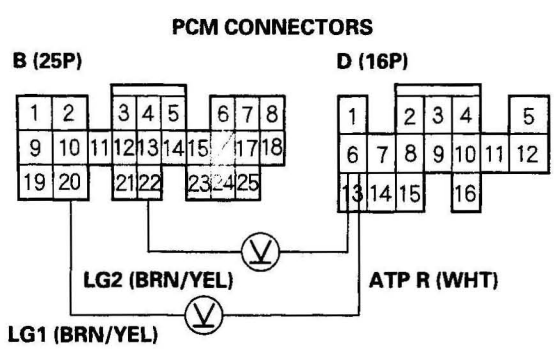
NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Disconnect transmission range switch connector.

   Do all gear position indicators except 1 go out?

   YES – Replace the transmission range switch. ■

   NO – Go to step 3.
3. Turn the ignition switch OFF, and connect transmission range switch connector.
4. Turn the ignition switch ON (II).
5. Shift to all positions other than R.
6. Measure the voltage between PCM connector terminals D6 and B20 or B22.



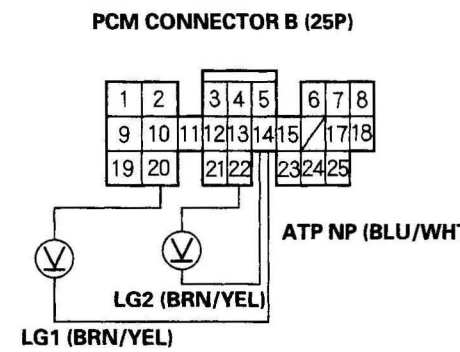
Wire side of female terminals

Is there battery voltage?

YES – Go to step 7.

NO – Check for a short in the wire between PCM connector terminal D6 and the transmission range switch or A/T gear position indicator, and check for an open in the wires between PCM connector terminals B20, B22 and body ground (G101). If necessary, substitute a known-good PCM and recheck. ■

7. Shift to all positions other than P or N.
8. Measure the voltage between PCM connector terminals B14 and B20 or B22.



Wire side of female terminals

Is there about 5 V?

YES – Go to step 9.

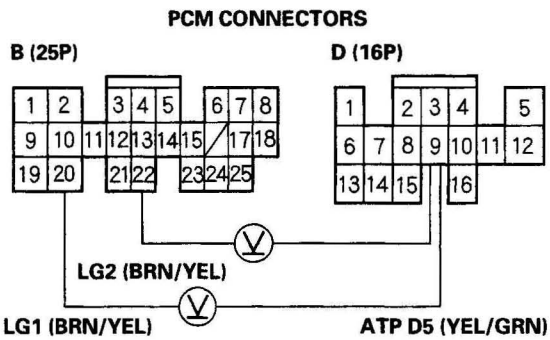
NO – Check for a short in the wire between PCM connector terminal B14 and the transmission range switch, and in the P and N position signal wires between the A/T gear position indicator and the transmission range switch. If necessary, substitute a known-good PCM and recheck. ■

BACK

Protected by AR

9. Shift to all positions other than D5.

10. Measure the voltage between PCM connector terminals D9 and B20 or B22.



Wire side of female terminals

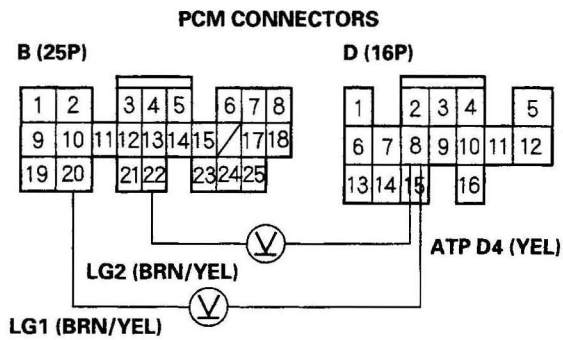
Is there about 5 V?

YES – Go to step 11.

NO – Check for a short in the wire between PCM connector terminal D9 and the transmission range switch. If necessary, substitute a known-good PCM and recheck. ■

11. Shift to all positions other than D4.

12. Measure the voltage between PCM connector terminals D8 and B20 or B22.



Wire side of female terminals

Is there battery voltage?

YES – Go to step 13.

NO – Check for a short in the wire between PCM connector terminal D8 and the transmission range switch or A/T gear position indicator. If necessary, substitute a known-good PCM and recheck. ■

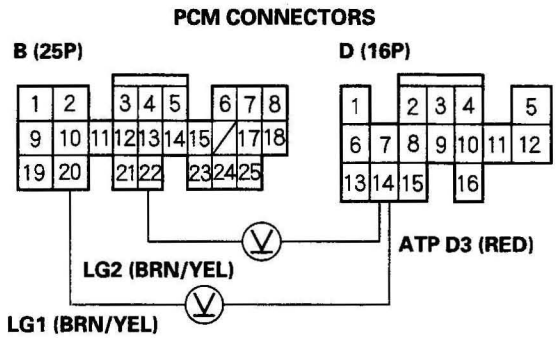
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

13. Shift to all positions other than D3.

14. Measure the voltage between PCM connector terminals D14 and B20 or B22.



Wire side of female terminals

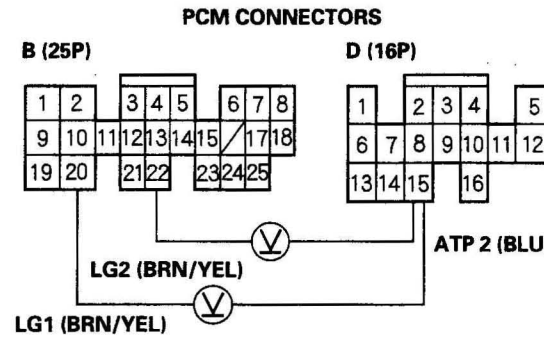
Is there battery voltage?

YES – Go to step 15.

NO – Check for a short in the wire between PCM connector terminal D14 and the transmission range switch or A/T gear position indicator. If necessary, substitute a known-good PCM and recheck. ■

15. Shift to all positions other than 2.

16. Measure the voltage between PCM connector terminals D15 and B20 or B22.



Wire side of female terminals

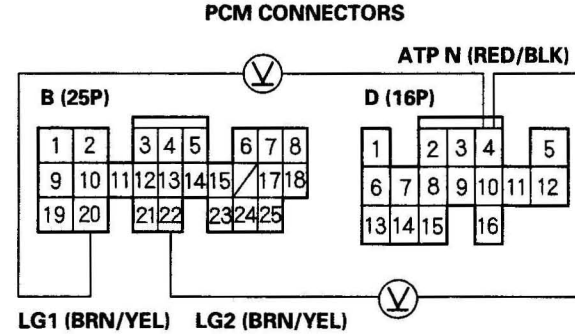
Is there battery voltage?

YES – Go to step 17.

NO – Check for a short in the wire between PCM connector terminal D15 and the transmission range switch or A/T gear position indicator. If necessary, substitute a known-good PCM and recheck. ■

17. Shift to all positions other than N.

18. Measure the voltage between PCM connector terminals D4 and B20 or B22.



Wire side of female terminals

Is there battery voltage?

YES – If necessary, substitute a known-good PCM and recheck. ■

NO – Check for a short in the wire between PCM connector terminal D4 and the transmission range switch or A/T gear position indicator. If necessary, substitute a known-good PCM and recheck. ■

BACK

Protected by AR

DTC P1706: Open in Transmission Range Switch Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Test the transmission range switch (see page 14-383).

   Is the switch OK?

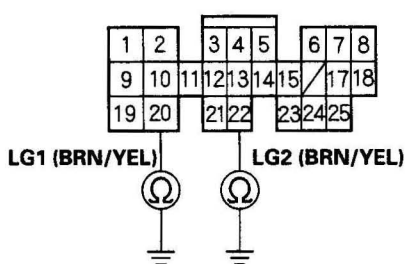
   YES – Go to step 2.

   NO – Replace the transmission range switch. ■

2. Turn the ignition switch OFF.

3. Check for continuity between body ground and PCM connector terminals B20 and B22 individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES – Go to step 4.

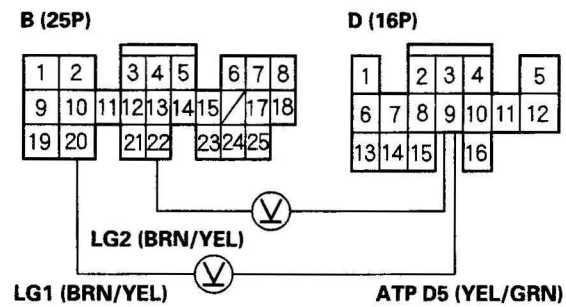
NO – Repair open in the wires between PCM connector terminals B20, B22 and ground (G101). Repair poor ground (G101). ■

4. Turn the ignition switch ON (II).

5. Shift to the D5 position.

6. Measure the voltage between PCM connector terminals D9 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D9 and the transmission range switch. ■

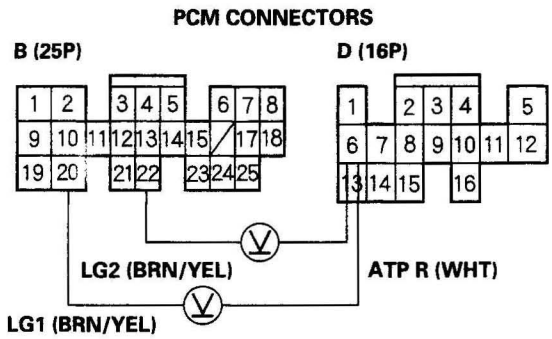
NO – Go to step 7.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Shift to the R position.
8. Measure the voltage between PCM connector terminals D6 and B20 or B22.



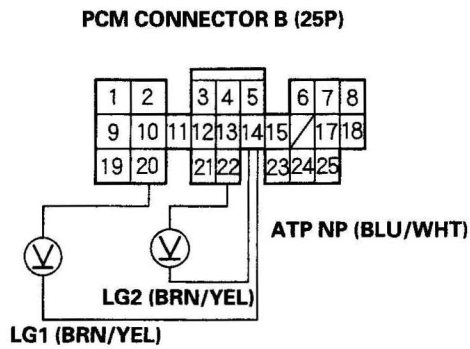
Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D6 and the transmission range switch. ■

NO – Go to step 9.

9. Shift to the P or N position.
10. Measure the voltage between PCM connector terminals B14 and B20 or B22.



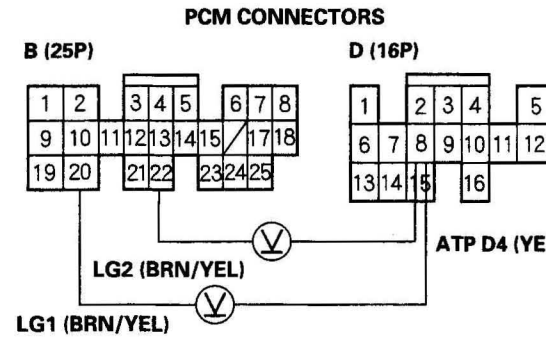
Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal B14 and the transmission range switch. ■

NO – Go to step 11.

11. Shift to the D4 position.
12. Measure the voltage between PCM connector terminals D8 and B20 or B22.



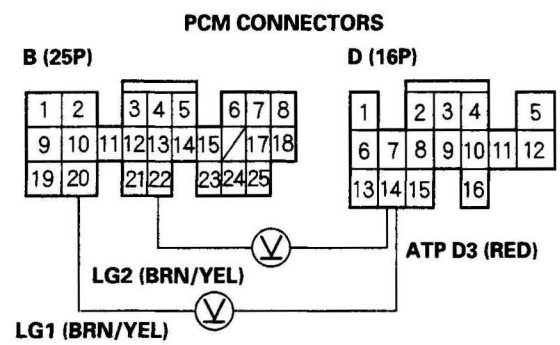
Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D8 and the transmission range switch. ■

NO – Go to step 13.

13. Shift to the D3 position.
14. Measure the voltage between PCM connector terminals D14 and B20 or B22.



Wire side of female terminals

Is there voltage?

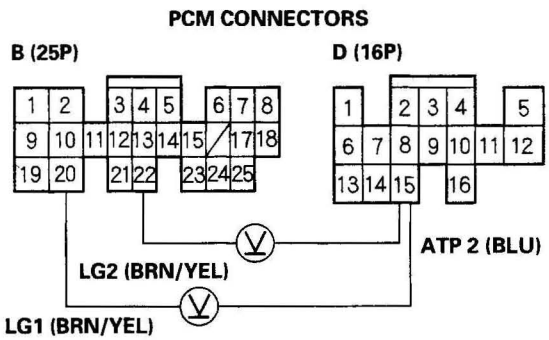
YES – Repair open in the wire between PCM connector terminal D14 and the transmission range switch. ■

NO – Go to step 15.

BACK

Protected by AR

15. Shift to the 2 position.
16. Measure the voltage between PCM connector terminals D15 and B20 or B22.



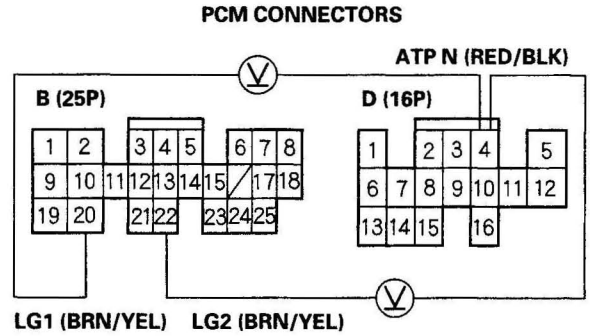
Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D15 and the transmission range switch. ■

NO – Go to step 17.

17. Shift to the N position.
18. Measure the voltage between PCM connector terminals D4 and B20 or B22.



Wire side of female terminals

Is there voltage?

YES – Repair open in the wire between PCM connector terminal D4 and the transmission range switch. ■

NO – Check for loose terminal fit in the PCM connector terminals B14, D4, D6, D8, D9, D14 and D 15. If necessary, substitute a known-good PCM and recheck. ■

BACK

Protected by AR

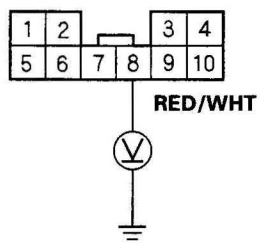
DTC Troubleshooting (cont'd)

DTC P1709: Problem in Transmission Gear Selection Switch Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Turn the ignition switch OFF.
2. Remove the center console.
3. Disconnect the transmission gear selection switch connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the No. 8 terminal of the transmission gear selection switch connector and body ground.

TRANSMISSION GEAR SELECTION SWITCH CONNECTOR



Wire side of female terminals

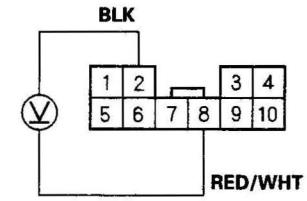
Is there about 5 V?

YES – Go to step 6.

NO – Repair open or short in the wire between PCM connector terminal E20 and the transmission gear selection switch connector. ■

6. Measure the voltage between the No. 2 and No. 8 terminal of the transmission gear selection switch connector.

TRANSMISSION GEAR SELECTION SWITCH CONNECTOR



Wire side of female terminals

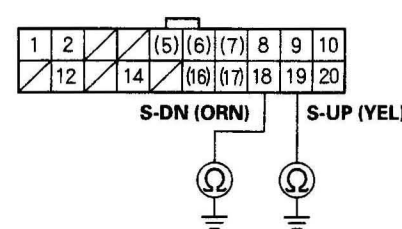
Is there about 5 V?

YES – Go to step 7.

NO – Repair open in the wire between the No. 2 terminal of the transmission gear selection switch connector and ground, and repair poor ground (G401). ■

7. Turn the ignition switch OFF.
8. Disconnect PCM connector E (20P).
9. Check for continuity between PCM connector terminal E18 and body ground, and between E19 and body ground.

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there continuity?

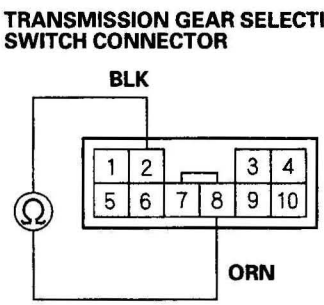
YES – Repair short to ground in the wire between PCM connector terminals E18, E19 and the transmission gear selection switch connector. ■

NO – Go to step 10.

BACK

Protected by AR

10. Measure the resistance between the No. 8 and No. 2 terminals of the transmission gear selection switch connector with the shift lever in the sequential sportshift mode position and when releasing it from the sequential sportshift mode position.



Terminal side of male terminals

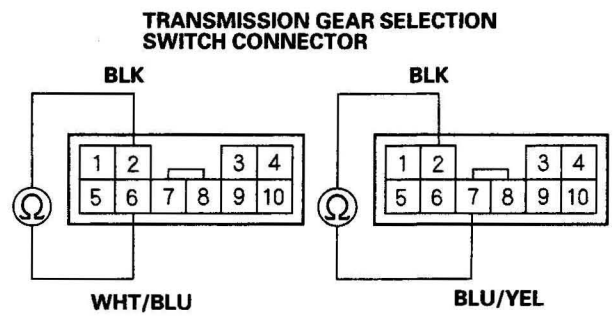
Is the resistance 0Ω in the sequential sportshift mode position, and 10 MΩ or more when out of the sequential sportshift mode position?

YES – Go to step 11.

NO – Faulty transmission gear selection switch. Replace the shift lever detent bracket assembly. ■

11. Shift the shift lever into the sequential sportshift mode position.

12. Measure the resistance between the No. 6 and No. 2 terminals of the transmission gear selection switch connector while pushing the shift lever toward the "+" mark on the A/T gear position indicator panel; then measure the resistance in neutral position.
Measure the resistance between the No. 7 and No. 2 terminals while pulling the shift lever toward the "−" mark; then measure the resistance in neutral position.



Terminal side of male terminals

Is the resistance 0 Ω with the shift lever pushing toward the "+" mark, and pulling toward the "−" mark, and 10 M Ω or more with it released?

YES – Check for loose terminal fit in the PCM connectors E18, E19 and E20. If necessary, substitute a known-good PCM and recheck. ■

NO – Faulty transmission gear selection switch. Replace the shift lever detent bracket assembly. ■

BACK

Protected by AR

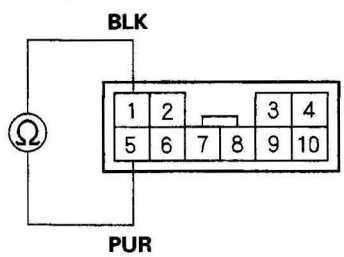
DTC Troubleshooting (cont'd)

DTC P1710: Problem in 1st-hold Switch Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Remove the center console.
2. Disconnect the switch connector.
3. Check for continuity between the No. 5 and No. 1 terminals of the transmission gear selection switch connector when the shift lever is in the 1 position, and then in all positions other than 1.

TRANSMISSION GEAR SELECTION SWITCH CONNECTOR



Terminal side of male terminals

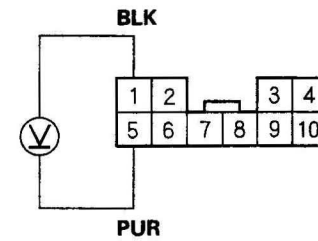
Is there continuity when the shift lever is in the 1 position, and no continuity when the shift lever is in all positions other than 1?

YES – Go to step 4.

NO – Faulty 1st-hold switch. Replace the shift lever detent bracket assembly. ■

4. Turn the ignition switch ON (II).
5. Measure the voltage between the No. 5 and No. 1 terminals of the transmission gear selection switch connector.

TRANSMISSION GEAR SELECTION SWITCH CONNECTOR



Wire side of female terminals

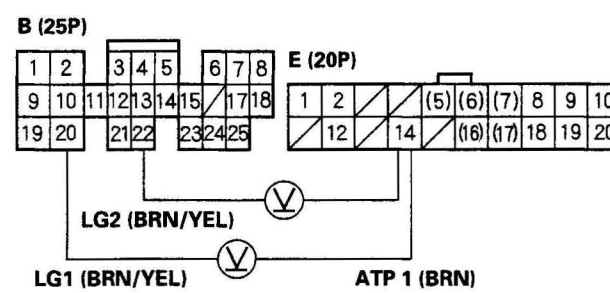
Is there battery voltage?

YES – Check for loose terminal fit in the transmission gear selection switch connector and the PCM connectors E14. If necessary, substitute a known-good PCM and recheck. ■

NO – Go to step 6.

6. Measure the voltage between PCM connector terminals E14 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Repair open in the wire between PCM connector terminal E14 and the 1st-hold switch. ■

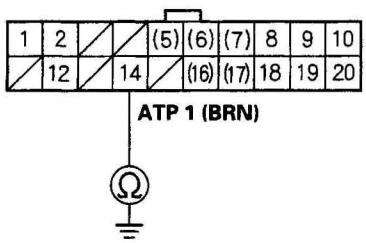
NO – Go to step 7.

BACK

Protected by AR

7. Turn the ignition switch OFF.
8. Disconnect PCM connector E (20P).
9. Check for continuity between PCM connector terminal E14 and body ground.

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector E, gauge assembly connector A, and the 1st-hold switch.■

NO—Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

BACK

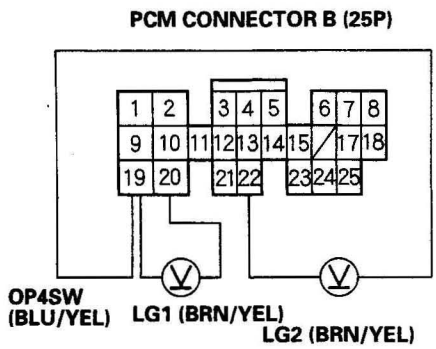
Protected by AR

DTC Troubleshooting (cont'd)

DTC P1740: Problem in 4th Clutch Pressure Switch Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Measure the voltage between PCM connector terminals B19 and B20 or B22.



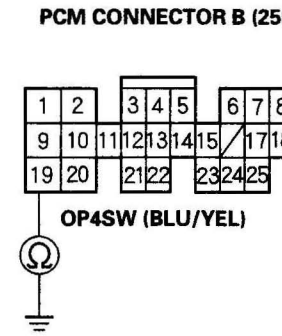
Wire side of female terminals

Is there battery voltage?

YES – Go to step 7.

NO – Go to step 3.

3. Turn the ignition switch OFF.
4. Disconnect PCM connector B (25P).
5. Disconnect the 4th clutch pressure switch connector.
6. Check for continuity between PCM connector terminal B19 and body ground.



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wire between PCM connector terminal B19 and the 4th clutch pressure switch. ■

NO – Go to step 15.

BACK

Protected by AR

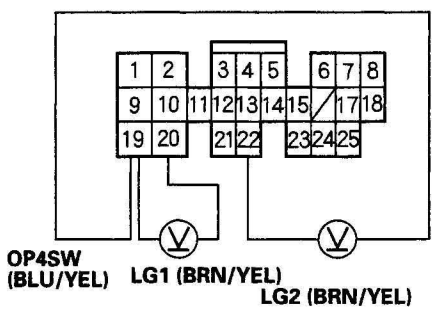
7. Raise the front of the vehicle, and make sure it is securely supported.

8. Set the parking brake, and block the rear wheels securely.

9. Start the engine, cancel the TCS or VSA (Type-S), then shift to D4 position and drive in 4th gear for more than 5 seconds.

10. Measure the voltage between PCM connector terminals B19 and B20 or B22.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there about 0 V?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Go to step 11.

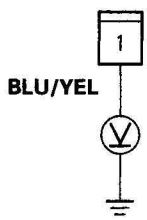
11. Turn the ignition switch OFF.

12. Disconnect the 4th clutch pressure switch connector.

13. Turn the ignition switch ON (II).

14. Measure the voltage between the 4th clutch pressure switch connector terminal and body ground.

4TH CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminal

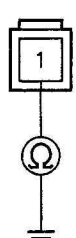
Is there battery voltage?

YES – Go to step 15.

NO – Repair open in the wire between the 4th clutch pressure switch and the PCM. ■

15. Measure the resistance between the 4th clutch pressure switch connector terminal and body ground.

4TH CLUTCH PRESSURE SWITCH CONNECTOR



Terminal side of male terminal

Is the resistance 10 MΩ or more?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

NO – Replace the 4th clutch pressure switch. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

DTC P1750: Mechanical Problem in Hydraulic Control System of A/T Clutch Pressure Control Solenoid Valves A and B, or Problem in Hydraulic Control System

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES – Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P1750 after troubleshooting. ■

   NO – Go to step 2.

2. Turn the ignition switch OFF.
3. Replace the A/T clutch pressure control solenoid valves A and B (see page 14-344).
4. Reset the PCM memory by removing the BACK UP fuse in the passenger's under-dash fuse relay box for more than 10 seconds.
5. Calibrate the engine control system in the PCM (see page 11-158), and drive the vehicle for several minutes in 1st, 2nd, 3rd, 4th, and 5th gears in the D$_5$ position.
6. Recheck for code P1750.

   Does the OBD II scan tool indicate code P1750?

   YES – Replace the transmission. ■

   NO – The problem has been corrected. ■

BACK

Protected by AR

DTC P1751: Mechanical Problem in Hydraulic Control System of Shift Solenoid Valve B and A/T Clutch Pressure Control Solenoid Valves A and B, or Problem in Hydraulic Control System

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-219) before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - Shift solenoid valve B
  - A/T clutch pressure control solenoid valves A and B

1. Check whether the OBD II scan tool indicates another code.

   Does the OBD II scan tool indicate another code?

   YES – Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P1751 after troubleshooting. ■

   NO – Go to step 2.

2. Turn the ignition switch OFF.

3. Replace the shift solenoid valve B (see page 14-341).

4. Replace the A/T clutch pressure control solenoid valves A and B (see page 14-344).

5. Drive the vehicle for several minutes in 1st, 2nd, 3rd, 4th, and 5th gears in the D5 position.

6. Recheck for code P1751.

   Does the OBD II scan tool indicate code P1751?

   YES – Replace the transmission. ■

   NO – The problem has been corrected. ■

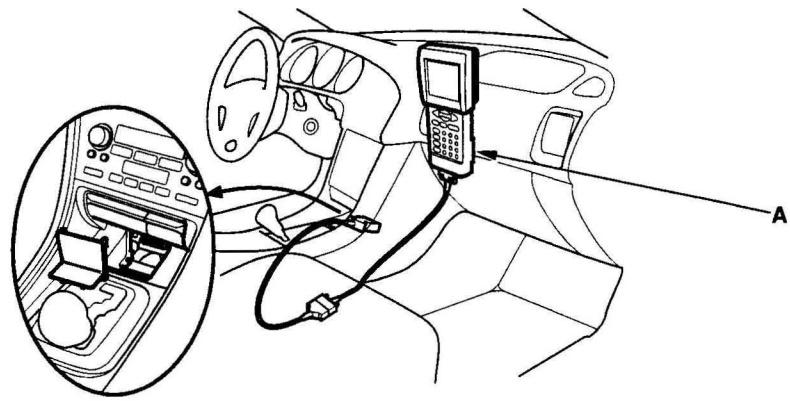
BACK

Protected by AR

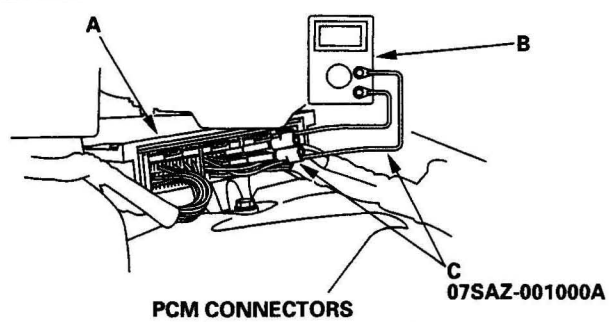
Road Test

Special Tools Required
Backprobe Set 07SAZ-001000A (Two required)

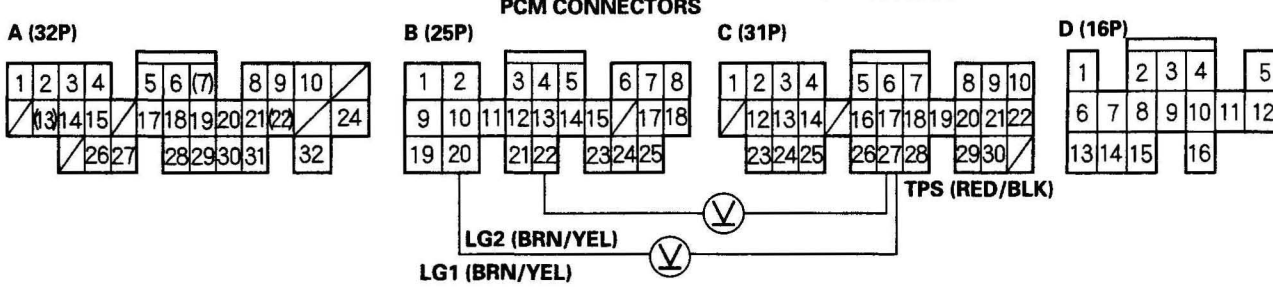
1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Apply the parking brake, and block rear wheels. Start the engine, then shift to the D5 position while pressing the brake pedal. Press the accelerator pedal, and release it suddenly. The engine should not stall.
3. Repeat the same test in the D4, D3, 2 and 1 position.
4. Connect the Honda PGM Tester (A), and go to the PGM-FI Data List; then go to step 7. If you don't have a PGM Tester, go to step 5.



5. Remove the center console (see page 20-63), then remove the PCM (A).
6. Connect a digital multimeter (B) and the special tools (C) to check voltage between the C27 (+) terminal and B20 (−) or B22 (−) terminal of the PCM.



PCM CONNECTORS



Wire side of female terminals

BACK

Protected by AR

7. Test-drive the vehicle on a flat road in the D5 position. Check for abnormal noise and clutch slippage. While driving, check that the shift points occur at the proper speeds by monitoring the throttle position sensor voltage and comparing your shift point speeds and voltage to those in the table. (The throttle position sensor voltage represents the throttle opening.)

Premium Model:

Upshift-D5 position

Throttle Opening	Unit of Speed	1st → 2nd	2nd → 3rd	3rd → 4th	4th → 5th	Lock-up ON
Throttle position	mph	8–9	16–19	24–28	45–48	48–51
sensor voltage: 0.75 V	km/h	13–15	26–30	39–45	72–78	78–82
Throttle position	mph	20–22	39–42	57–61	78–82	78–82
sensor voltage: 2.25 V	km/h	32–36	62–68	92–98	126–132	126–132
Fully-opened throttle.	mph	34–38	59–63	91–95	———	124–130
Throttle position	km/h	55–61	95–101	147–153	———	200–209
sensor voltage: 4.5 V						

Downshift-D5 position

Throttle Opening	Unit of Speed	Lock-up OFF	5th → 4th	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position	mph	45–48	36–39	17–19	9–10	9–10
sensor voltage: 0.75 V	km/h	73–77	58–62	27–31	14–16	14–16
Throttle position	mph	70–73	54–58	32–36	19–22	9–10
sensor voltage: 2.25 V	km/h	112–118	87–93	52–58	30–36	14–16
Fully-opened throttle.	mph	94–98	———	78–82	52–55	26–30
Throttle position	km/h	152–158	———	126–132	83–89	42–48
sensor voltage: 4.5 V						

Type S Model:

Upshift-D5 position

Throttle Opening	Unit of Speed	1st → 2nd	2nd → 3rd	3rd → 4th	4th → 5th	Lock-up ON
Throttle position	mph	8–9	16–19	24–28	45–48	48–51
sensor voltage: 0.75 V	km/h	13–15	26–30	39–45	72–78	78–82
Throttle position	mph	24–27	42–45	66–70	86–90	86–90
sensor voltage: 2.25 V	km/h	39–43	67–73	106–112	139–145	139–145
Fully-opened throttle.	mph	38–42	65–69	103–106	———	132–136
Throttle position	km/h	61–67	105–111	165–171	———	213–219
sensor voltage: 4.5 V						

Downshift-D5 position

Throttle Opening	Unit of Speed	Lock-up OFF	5th → 4th	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position	mph	45–48	36–39	17–19	9–10	9–10
sensor voltage: 0.75 V	km/h	73–77	58–62	27–31	14–16	14–16
Throttle position	mph	70–73	55–59	33–37	19–22	9–10
sensor voltage: 2.25 V	km/h	112–118	89–95	53–59	30–36	14–16
Fully-opened throttle.	mph	94–98	———	82–86	53–57	29–33
Throttle position	km/h	152–158	———	132–138	86–92	47–53
sensor voltage: 4.5 V						

(cont'd)

BACK

Protected by AR

Road Test (cont'd)

8. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th, then shift from the D4 position to 2 position. The vehicle should immediately begin slowing down from engine braking.

9. Check for abnormal noise and clutch slippage in the following positions.

   1 (1st Gear) Position
   Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage. Upshifts should not occur with the shift lever in this position.

   2 (2nd Gear) Position
   Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage. Upshifts and downshifts should not occur with the shift lever in this position.

   R (Reverse) Position
   Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

10. Test in P (Park) Position.
    Park the vehicle on a slope (about 16°), apply the parking brake, and shift into the P position. Release the brake; the vehicle should not move.

BACK

Protected by AR

Stall Speed Test

1. Engage the parking brake, and block the front wheels.
2. Connect a tachometer to the engine, and start the engine.
3. Make sure the A/C switch is OFF.
4. After the engine has warmed up to normal operating temperature (the radiator fan comes on), shift to the [2] position.
5. Fully press the brake pedal, accelerate for 6 to 8 seconds, and note the engine speed. Do not move the shift lever while raising engine speed.
6. Allow two minutes for cooling, then repeat the test in the [D], [1], and [R] positions.

NOTE:
- Do not test stall speed for more than 10 seconds at a time.
- Stall speed tests should be used for diagnostic purposes only.
- Stall speed should be the same in the [D], [2], [1], and [R] positions.
- Do not test stall speed with the A/T pressure gauges installed.

Stall Speed rpm:
Specification: 2,400 rpm
Service Limit: 2,250 – 2,550 rpm

TROUBLE	PROBABLE CAUSE
Stall rpm high in the [D], [2], [1], and [R] positions	• Low fluid level or ATF pump output • Clogged ATF strainer • Pressure regulator valve stuck closed • Slipping clutch
Stall rpm high in the [1] position	Slippage of 1st clutch or 1st gear one-way clutch
Stall rpm high in the [2] position	Slippage of 2nd clutch
Stall rpm high in the [R] position	Slippage of 5th clutch
Stall rpm low in the [D], [2], [1], and [R] positions	• Engine output low • Torque converter one-way clutch slipping

Protected by AR

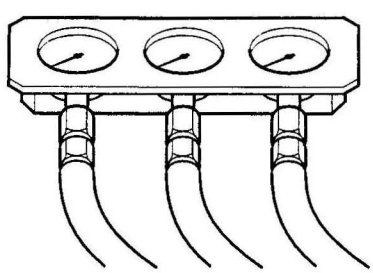
Pressure Tests

Special Tools Required
- A/T oil pressure gauge set 07406-0020400 or 07406-0020401
- A/T pressure hose, 2210 mm 07MAJ-PY4011A
- A/T pressure hose adapter 07MAJ-PY40120

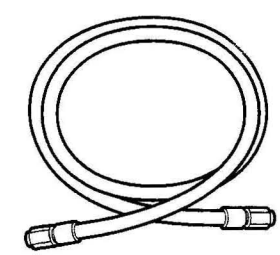
1. Before testing, be sure the transmission fluid is filled to the proper level.
2. Raise the front of the vehicle, and make sure it is securely supported.
3. Set the parking brake, and block rear wheels securely.
4. Allow the front wheels to rotate freely.
5. Warm up the engine (the radiator fan comes on), then stop it and connect a tachometer.
6. Connect the oil pressure gauges to each inspection hole securely, and do not allow dust or other foreign particles to enter the holes.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

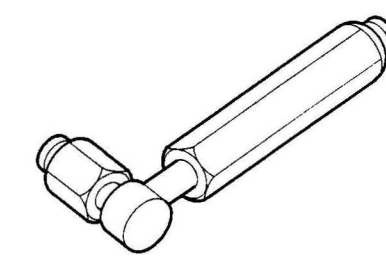
A/T OIL PRESSURE GAUGE SET W/PANEL 07406-0020400 or 07406-0020401

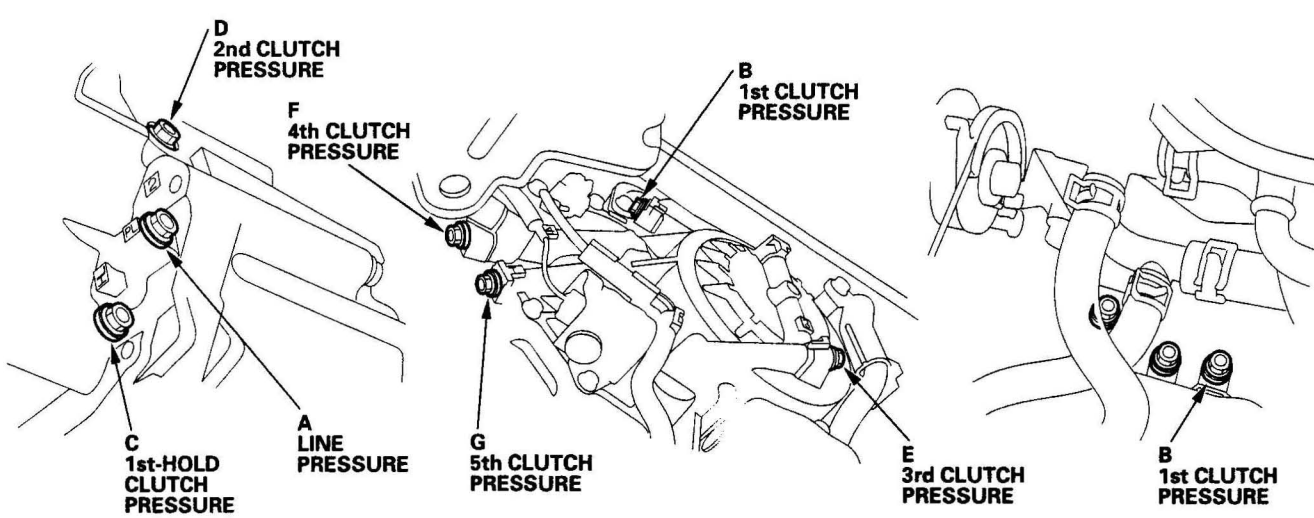


A/T PRESSURE HOSE, 2210 mm 07MAJ-PY4011A (4 Required)



A/T PRESSURE HOSE ADAPTER 07MAJ-PY40120 (4 Required)





BACK

Protected by AR

7. Start the engine, and run it at 1,500 rpm in the P or N position.
8. Measure line pressure at line pressure inspection hole (A) in the N or P position.
   NOTE: Higher pressure may be indicated if measurements are made in shift lever positions other than N or P.
9. Shift to the 1 position, and measure 1st clutch pressure at the 1st clutch pressure inspection hole (B) and 1st-hold clutch pressure at the1st-hold clutch inspection hole (C).
10. Shift to the 2 position, and measure 2nd clutch pressure at the 2nd clutch pressure inspection hole (D).
11. Shift to the P position, then press the brake pedal and hold it.
12. Shift to the 2 position, and release the brake pedal (the transmission should be in 2nd gear).
13. Press the accelerator very slowly to increase engine speed to 2,000 rpm gradually over 10 seconds, then hold it at 2,000 rpm for the remainder of the tests.
14. Shift to the D3 position (the transmission will shift to 3rd gear), and measure 3rd cluth pressure at the 3rd clutch pressure inspection hole (E).
15. Shift to the D4 position (the transmission will shift to 4th gear), and measure 4th clutch pressure at the 4th clutch pressure inspection hole (F).
16. Shift to the D5 position (the transmission will shift to 5th gear), and measure 5th clutch pressure at the 5th clutch pressure inspection hole (G).
17. Shift to the R position, and measure 5th clutch pressure at the 5th clutch pressure inspection hole.

PRESSURE	SHIFT LEVER POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Line (A)	N or P	No (or low) line pressure	Torque converter, ATF pump, pressure regulator valve, torque converter check valve	900 – 960 kPa (9.2 – 9.8 kgf/cm², 130 – 140 psi)	850 kPa (8.7 kgf/cm², 120 psi)
1st clutch (B)	1	No or low 1st pressure	1st clutch	890 – 970 kPa (9.1 – 9.9 kgf/cm², 130 – 140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
2nd clutch (D)	2	No or low 2nd pressure	2nd clutch		
3rd clutch (E)	D3	No or low 3rd pressure	3rd clutch		
4th clutch (F)	D4	No or low 4th pressure	4th clutch		
5th clutch (G)	D5	No or low 5th pressure	5th clutch		
	R		Servo valve or 5th clutch		
1st-hold clutch (C)	1	No or low 1st-hold clutch	1st-hold clutch	760 – 830 kPa (7.7 – 8.5 kgf/cm², 110 – 120 psi)	710 kPa (7.2 kgf/cm², 100 psi)

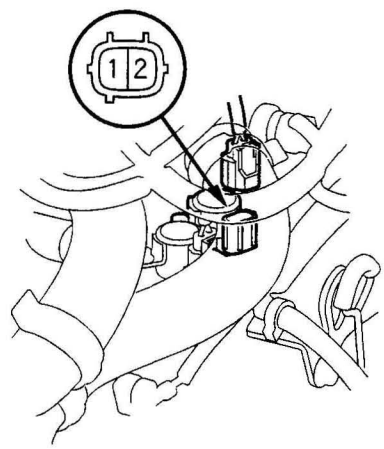
18. Reinstall the sealing bolts with new sealing washers, and tighten the bolts to the specified torque.
    TORQUE: 18 N·m (1.8 kgf·m,13 lbf·ft)

    NOTE: Do not reuse the old sealing washers.

Protected by AR

Torque Converter Clutch Solenoid Valve Test

1. Disconnect the connector from the torque converter clutch solenoid valve.



2. Measure torque converter clutch solenoid valve resistance at the solenoid valve connector (black).

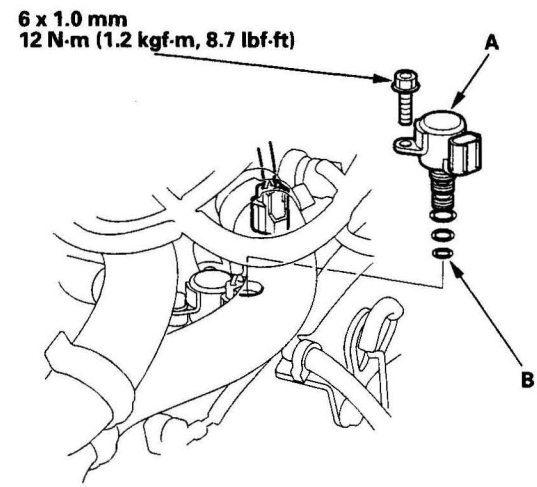
   STANDARD: 12–25 Ω

3. Replace torque converter clutch solenoid valve if the resistance is out of standard.

4. If the resistance is within the standard, connect the No. 2 terminal of the torque converter clutch solenoid valve connector to the battery positive terminal, and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard.
   Replace torque converter clutch solenoid valve if no clicking sound is heard.

Torque Converter Clutch Solenoid Valve Replacement

1. Remove the mounting bolt and torque converter clutch solenoid valve.



2. Install a new torque converter clutch solenoid valve (A) with new O-rings (B). When installing the solenoid valve, do not allow dust or other foreign particles to enter the transmission.

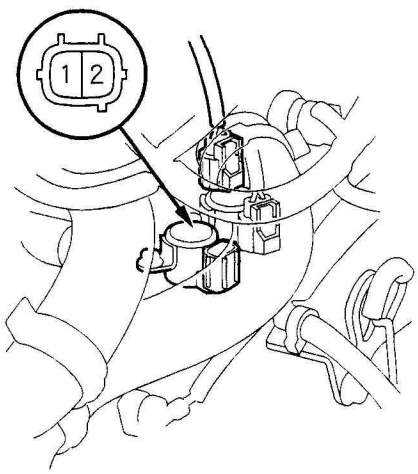
3. Check the connector for rust, dirt, or oil, then reconnect it.

BACK

Protected by AR

Shift Solenoid Valve B Test

1. Disconnect the connector from the shift solenoid valve B.



2. Measure shift solenoid valve B resistance at the solenoid valve connector (blown).

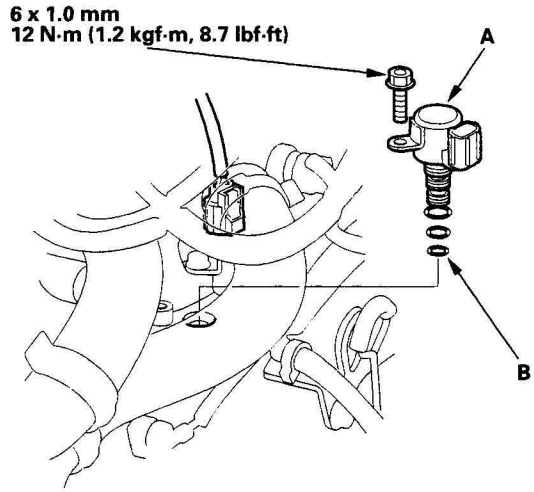
   STANDARD: 12–25 Ω

3. Replace the shift solenoid valve B if the resistance is out of standard.

4. If the resistance is within the standard, connect the No. 2 terminal of the shift solenoid valve B connector to the battery positive terminal and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard. Replace the shift solenoid valve B if no clicking sound is heard.

Shift Solenoid Valve B Replacement

1. Remove the mounting bolt and the shift solenoid valve B.



2. Install a new shift solenoid valve B (A) with new O-rings (B). When installing the solenoid valve, do not allow dust or other foreign particles to enter the transmission.

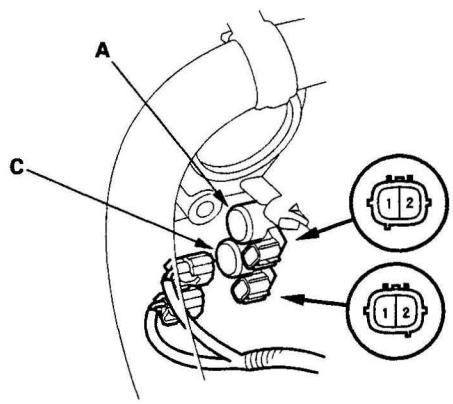
3. Check the connector for rust, dirt, or oil, then reconnect it.

BACK

Protected by AR

Shift Solenoid Valves A and C Test

1. Remove the starter.
2. Disconnect the shift control solenoid valve A and C connectors.



3. Measure the shift solenoid valve A and C resistance at each solenoid valve connector.

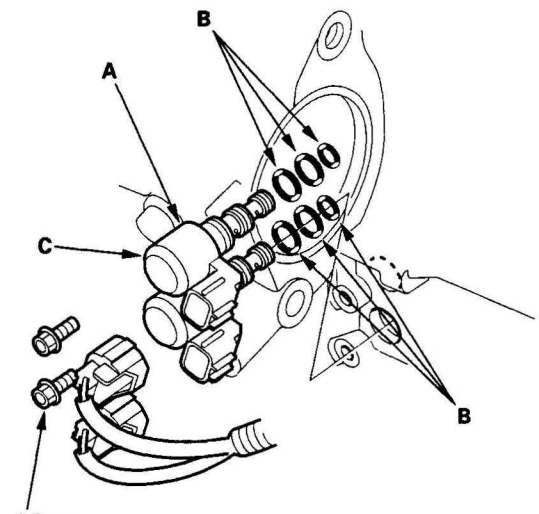
   STANDARD: 12–25 Ω

4. Replace shift solenoid valve A or C if the resistance is out of standard.
5. If the resistance is within the standard, connect the No. 2 terminal of the shift solenoid valve A or C connector to the battery positive terminal, and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard. Replace shift solenoid valve A or C if no clicking sound is heard.

Shift Solenoid Valves A and C Replacement

NOTE: If shift solenoid valves A and C are replaced or removed at the same time, be sure to reinstall them correctly. The connector color of shift solenoid valve A is black, and the connector color of shift solenoid valve C is brown.

1. If you are replacing shift solenoid valve C, remove the starter.
2. Remove the mounting bolt and the shift solenoid valve A.



6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)

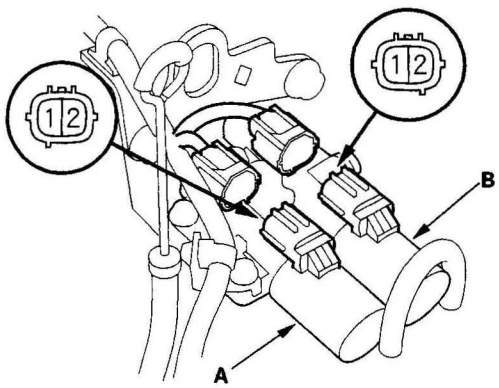
3. Remove the mounting bolt and shift solenoid valve C.
4. Install a new shift solenoid valve A or C with new O-rings (B). While installing the valves, do not allow dust or other foreign particles to enter the transmission.
5. Check the connector for rust, dirt, or oil, then reconnect it.
6. Install the starter, if removed.

BACK

Protected by AR

A/T Clutch Pressure Control Solenoid Valves A and B Test

1. Disconnect the 2P connectors from the A/T clutch pressure control solenoid valves A (A) and B (B).



2. Measure the A/T clutch pressure control solenoid valves A and B resistances at each solenoid valve connector.

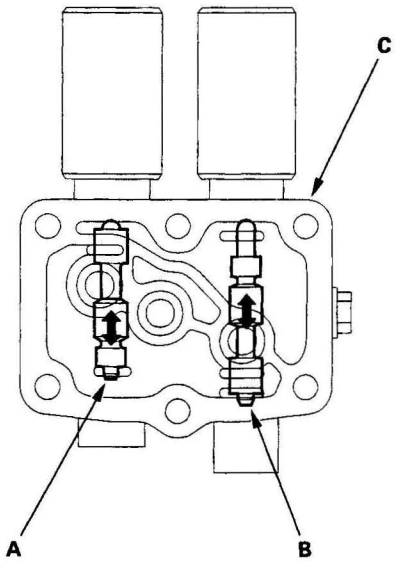
   STANDARD: About 5.0 Ω

3. If the resistance of either solenoid is out of standard, replace A/T clutch pressure control solenoid valves A and B.

4. Connect the No. 1 terminal of A/T clutch pressure control solenoid valves A and B to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. A clicking sound should be heard. Remove A/T clutch pressure control solenoid valves A and B, if no sound is heard.

5. Check the fluid passage of the A/T clutch pressure control solenoid valves for dust and dirt, and clean the passage if necessary.

6. Connect the No. 1 terminal of A/T clutch pressure control solenoid valves A and B to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure the A/T clutch pressure control solenoid valves A and B move.



7. Disconnect one of the battery terminals and check valve movement.

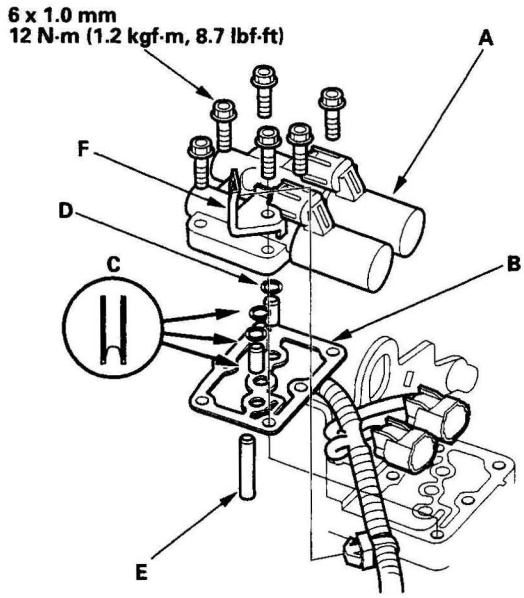
   NOTE: You can see the valve movement through the fluid passage in the mounting surface of the solenoid valve body (C).

8. If either valve binds, or moves sluggishly, or if the solenoid does not operate, replace the A/T clutch pressure control solenoid valves A and B.

Protected by AR

A/T Clutch Pressure Control Solenoid Valves A and B Replacement

1. Remove the harness cover from the transmission hanger.
2. Remove the mounting bolts and A/T clutch pressure control solenoid valves A and B (A).



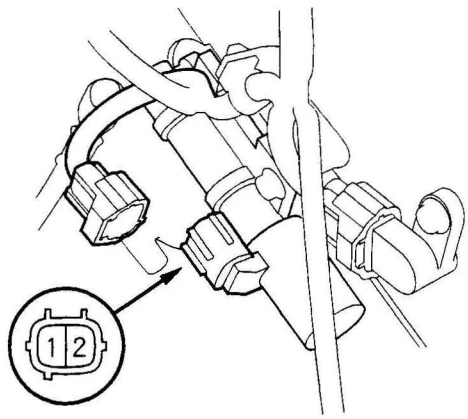
3. Clean the mounting surface and fluid passages of A/T clutch pressure control solenoid valves A and B and the transmission housing.
4. Place a new gasket (B) on the transmission housing, then install the 8 x 18 mm ATF feed pipes (C) with their filter sides into the transmission housing.
5. Install new O-rings (D) over the feed pipes, and install the 8 x 40 mm ATF feed pipe (E).
6. Install new A/T clutch pressure control solenoid valves A and B (A) and harness clamp bracket (F).
7. Check the A/T clutch pressure control solenoid valve connectors for rust, dirt, or oil, then connect them securely.
8. Install the harness cover on the transmission hanger.

BACK

Protected by AR

A/T Clutch Pressure Control Solenoid Valve C Test

1. Disconnect the connector from A/T clutch pressure control solenoid valve C.



2. Measure A/T clutch pressure control solenoid valve C resistance at the solenoid valve connector.

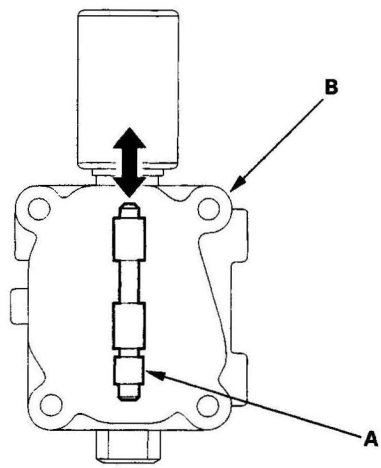
   STANDARD: About 5.0 Ω

3. If the resistance is out of standard, replace the A/T clutch pressure control solenoid valve C.

4. Connect the No. 1 terminal of A/T clutch pressure control solenoid valve C to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. A clicking sound should be heard. Remove A/T clutch pressure control solenoid valve C if no sound is heard.

5. Check the fluid passage of A/T clutch pressure control solenoid valve C for dust and dirt.

6. Connect the No 1 terminal of A/T clutch pressure control solenoid valve C to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure A/T clutch pressure control solenoid valve C (A) moves.



7. Disconnect one of the battery terminals and check valve movement.

   NOTE: You can see the valve movement through the fluid passage in the mounting surface of the body (B).

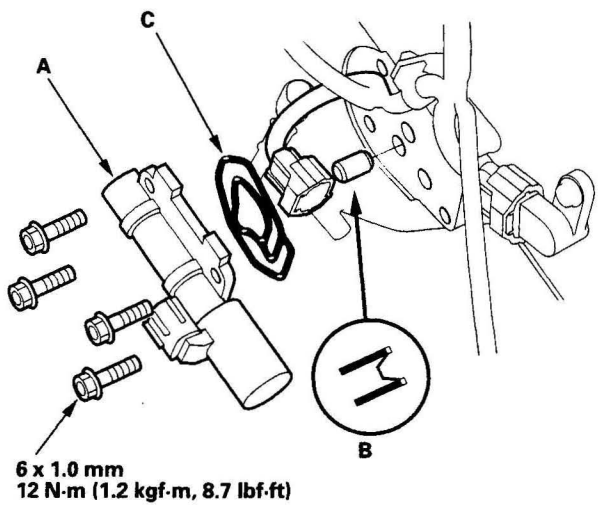
8. If the valve binds, or moves sluggishly, or if the solenoid does not operate, replace A/T clutch pressure control solenoid valve C.

BACK

Protected by AR

A/T Clutch Pressure Control Solenoid Valve C Replacement

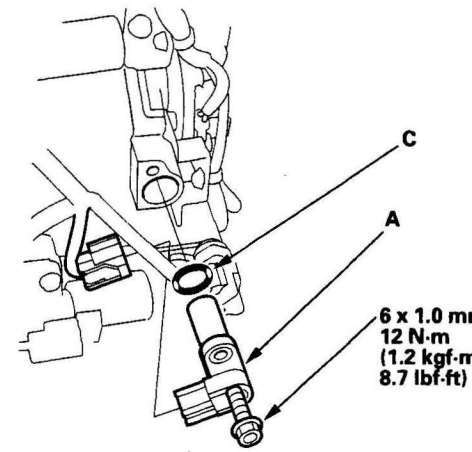
1. Disconnect the connector from A/T clutch pressure control solenoid valve C.
2. Remove A/T clutch pressure control solenoid valve C (A).



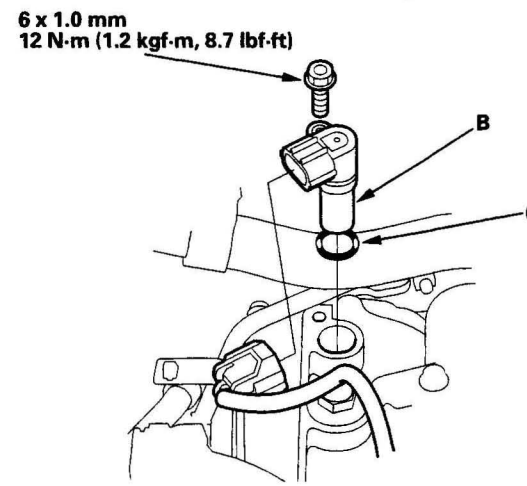
3. Clean the mounting surface and fluid passage of A/T clutch pressure control solenoid valve C and the transmission housing.
4. Install the 8 x 12 mm ATF feed pipe (B) with its filter side into the transmission housing.
5. Install the new gasket (C) in the mounting groove of A/T clutch pressure control solenoid valve C body properly, then install them on transmission housing. Do not pinch the gasket.
6. Check the solenoid connector for rust, dirt, or oil, and connect it securely.

Speed Sensor Replacement

1. Disconnect the connectors from the mainshaft and countershaft speed sensors.
2. Remove the bolt securing the mainshaft speed sensor, then remove the mainshaft speed sensor (A) from the end cover.



3. Remove the bolt securing the countershaft speed sensor, then remove the countershaft speed sensor (B) from the transmission housing.



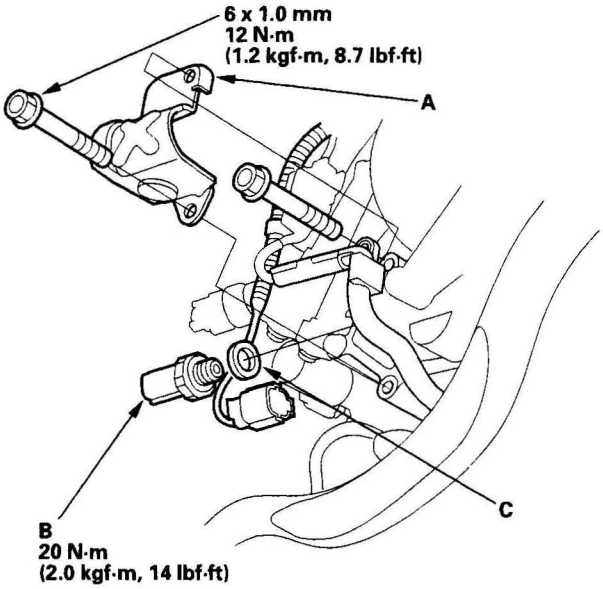
4. Replace the O-rings (C) with new ones before installing the sensors.
5. Install the mainshaft and countershaft speed sensors. When installing sensors, do not allow dust or other foreign particles to enter the transmission.
6. Check the connector for rust, dirt, or oil, then connect the connectors.

BACK

Protected by AR

3rd Clutch Pressure Switch Replacement

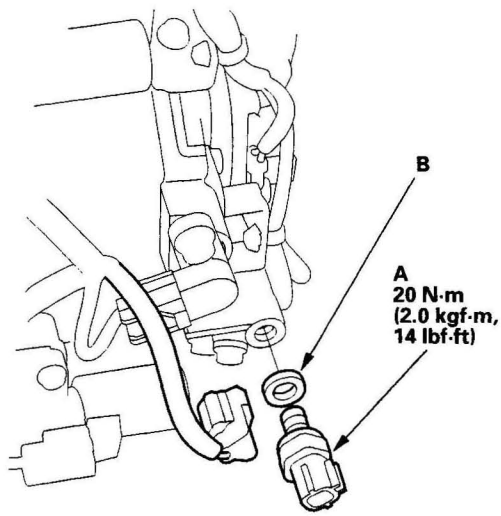
1. Remove the switch cover (A).



2. Disconnect the connector from the 3rd clutch pressure switch (B).
3. Replace the 3rd clutch pressure switch, then install a new one with a new sealing washer (C). Tighten the switch on the metal part, not the plastic part.
4. Reconnect the connector, making sure there is no water, oil, dust, or other foreign particles inside it.
5. Install the switch cover.

4th Clutch Pressure Switch Replacement

1. Disconnect the connector from the 4th clutch pressure switch (A).



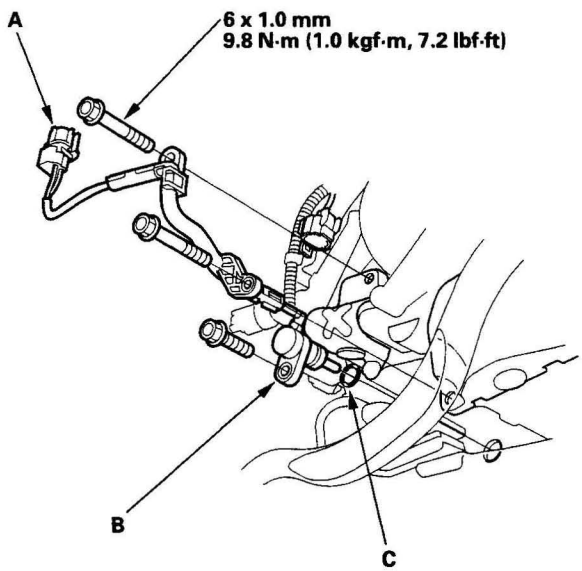
2. Replace the 4th clutch pressure switch, then install a new one with a new sealing washer (B). Tighten the switch on the metal part, not the plastic part.
3. Reconnect the connector, making sure there is no water, oil, dust, or other foreign particles inside it.

BACK

Protected by AR

ATF Temperature Sensor Replacement

1. Disconnect the connector (A) from the ATF temperature sensor.



2. Remove the bolts securing the sensor harness clamp and ATF temperature sensor, then remove the ATF temperature sensor (B).
3. Install the new ATF temperature sensor with a new O-ring (C).
4. Install the harness clamp, then connect the connector.

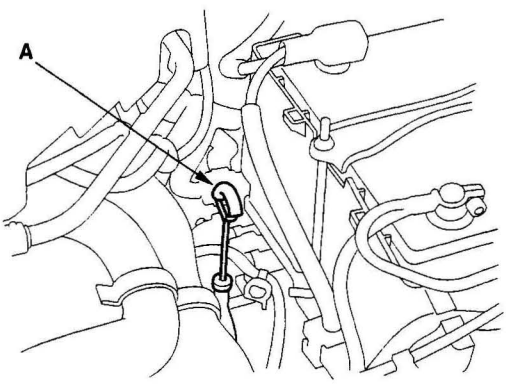
BACK

Protected by AR

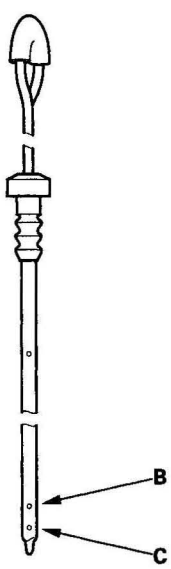
ATF Level Check

NOTE: Keep all foreign particles out of the transmission.

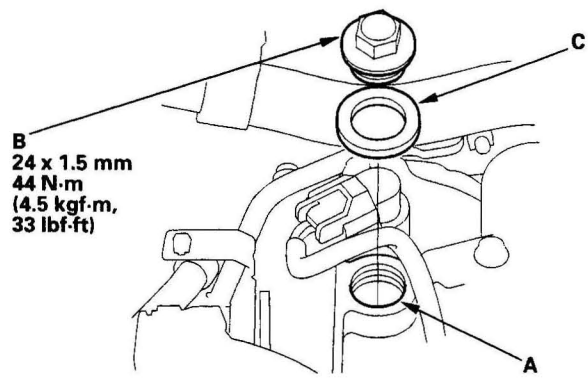
1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Park the vehicle on the level ground. Turn off the engine.
3. Remove the dipstick (yellow loop) (A) from the transmission, and wipe it with a clean cloth.



4. Insert the dipstick into the transmission.
5. Remove the dipstick and check the fluid level. It should be between the upper mark (B) and lower mark (C).



6. If the level is below the lower mark, pour the recommended fluid into the filler hole (A) to bring it to the upper mark. Always use Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.



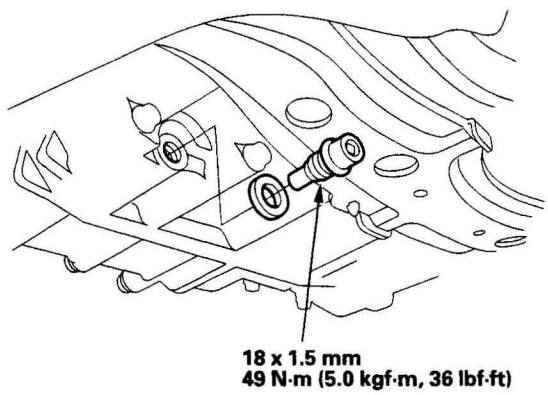
7. Install the ATF filler bolt (B) with a new sealing washer (C).
8. Insert the dipstick back into the transmission.

Protected by AR

ATF Replacement

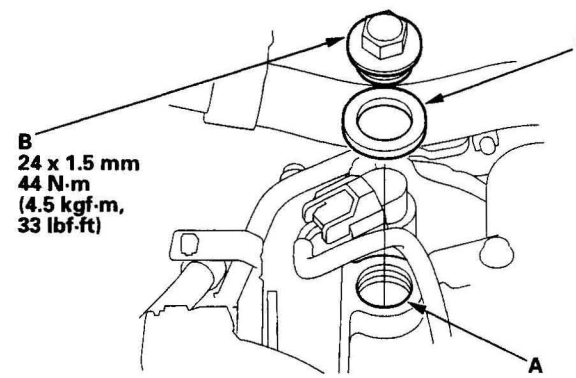
NOTE: Keep all foreign particles out of the transmission.

1. Bring the transmission up to operating temperature (the radiator fan comes on) by driving the vehicle.
2. Park the vehicle on the level ground, and turn the engine off.
3. Remove the ATF filler bolt and drain plug, and drain the automatic transmission fluid (ATF).



4. Reinstall the drain plug with a new sealing washer.
5. Refill the transmission with the recommended fluid into the filler hole (A) to the upper mark on the dipstick. Always use Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

   Automatic Transmission Fluid Capacity:
   2.9 ℓ (3.1 US qt) at changing
   7.2 ℓ (7.6 US qt) at overhaul



6. Install the ATF filler bolt (B) with a new sealing washer (C).

BACK

Protected by AR

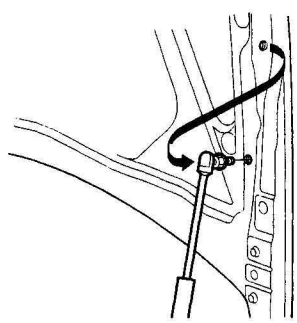
Transmission Removal

Special Tools Required
Engine hanger, A and Reds AAR-T-12566 or equivalent, commercially available.

1. Before disconnecting the battery, make sure you have the anti-theft code for the radio and navigation system, then write down the frequencies for the radio's preset stations.

2. Remove the bolts securing the support struts on both sides of the hood. Secure the hood in a veritical position, then install the left strut in the lower position.

   NOTE: Do not attempt to close the hood with the support struit in the vertical position; it will damage the support strut and hood.



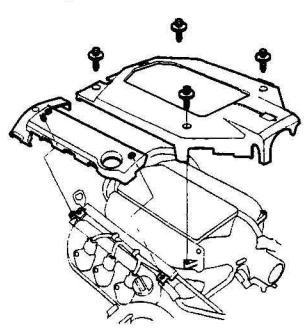
3. Disconnect the battery negative terminal, then remove the positive terminal.

4. Remove the battery hold-down bracket, then remove the battery and battery tray.

5. Remove the battery cable clamps from the battery base, then remove the battery base.

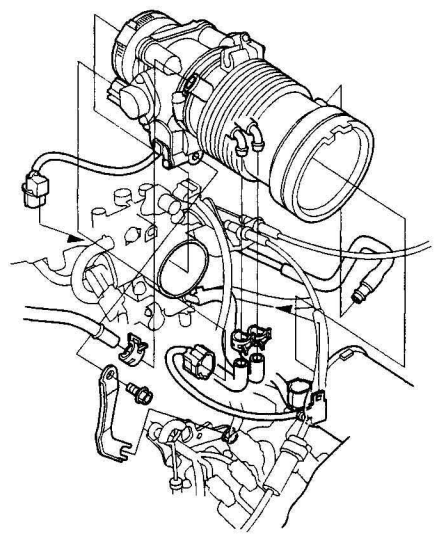
6. Loosen the mounting bolt securing the battery base bracket, then remove the battery base bracket.

7. Remove the engine covers.

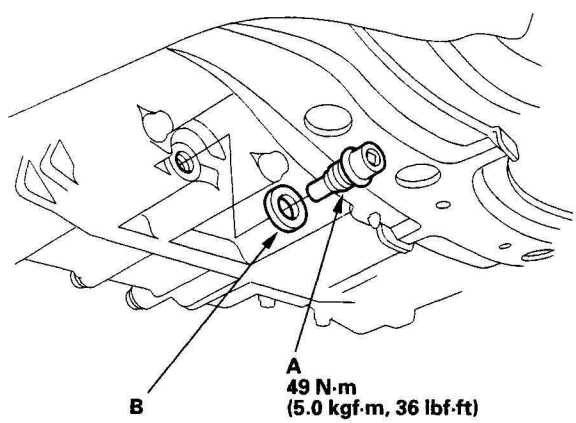


8. Remove the intake air duct.
   - Premium: Remove the intake air duct.
   - Type-S: Remove the intake air duct-TCS control valve assembly.

   The illustration shows the Type S.



9. Raise the vehicle, and make sure it is securely supported. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer (B).

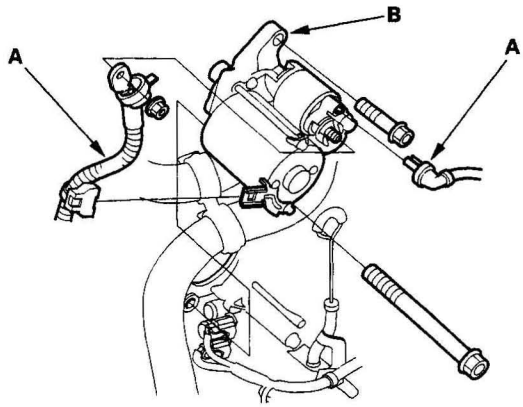


(cont'd)

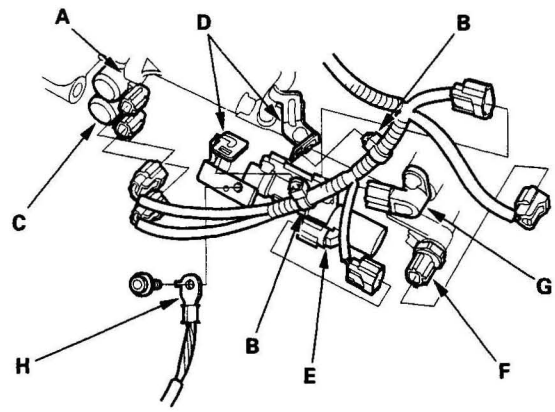
Protected by AR

Transmission Removal (cont'd)

10. Remove the starter cables (A) from the starter (B), then remove the starter.

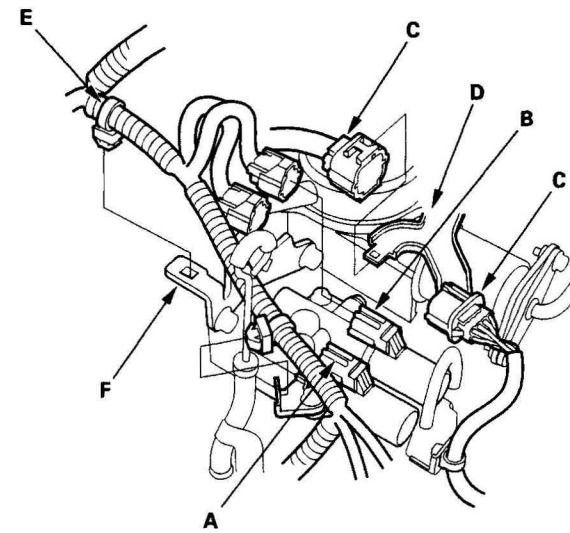


11. Remove the harness clamps (B) from the clamp brackets (D), then disconnect the connectors from the shift solenoid valves A and C, A/T clutch pressure control solenoid valve C (E), 4th clutch pressure switch (F), and mainshaft speed sensor (G).



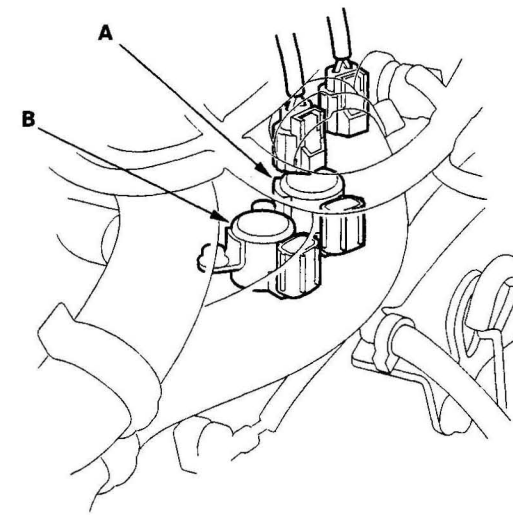
12. Remove the transmission ground cable (H).

13. Remove the 8P connector (C) from the connector braket (D), then disconnect the connector.



14. Remove the harness clamp (E) from the clamp bracket (F), then disconnect the connectors from A/T clutch pressure control solenoid valves A and B.

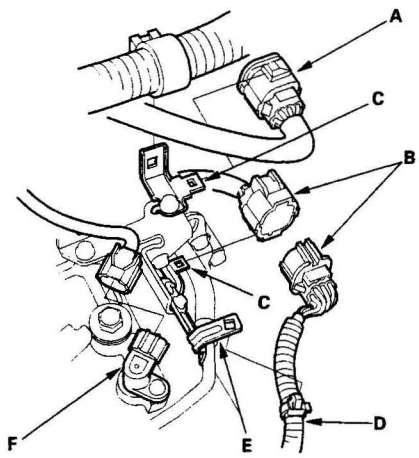
15. Disconnect the connectors from the torque converter clutch solenoid valve (A) and shift solenoid valve B.



BACK

Protected by AR

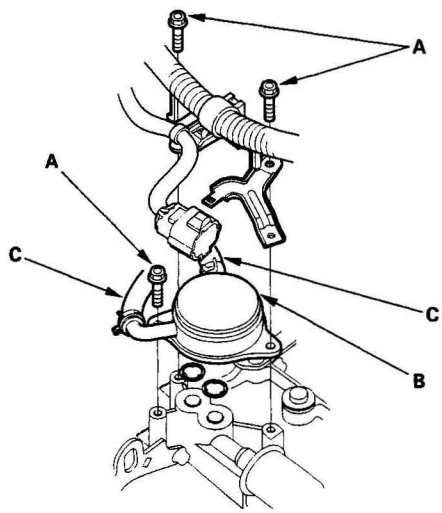
16. Remove the joint connector (A) and transmission range switch connector (B) from the connector bracket (C).



17. Disconnect the transmission range switch connector (B), then remove the harness clamp (D) from the clamp bracket (E).

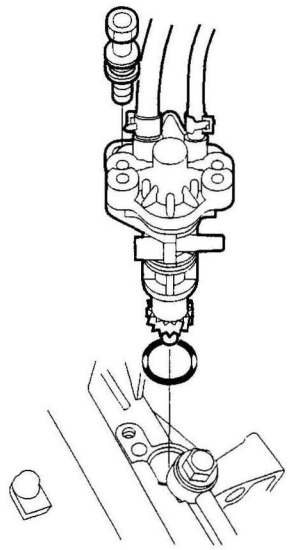
18. Disconnect the connector from the countershaft speed sensor (F).

19. Put shop rags around the ATF warmer (B) to remove the ATF that flows out.

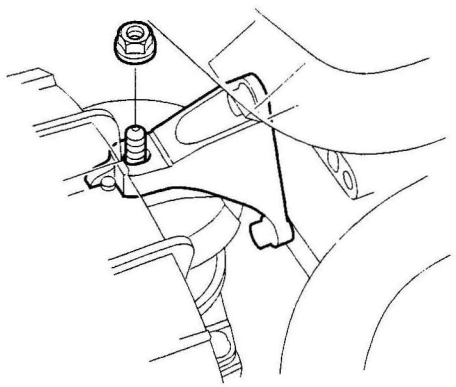


20. Remove the bolts (A) securing the ATF warmer (B), then remove the ATF warmer from the transmission housing. Cover the fluid passages on the transmission and ATF warmer with tape. Do not allow dust or other particles to enter. Do not disconnect the hoses (C).

21. Only for Premium; Remove the power steering speed sensor. Do not remove the hoses.



22. Remove the nut from the front mount.



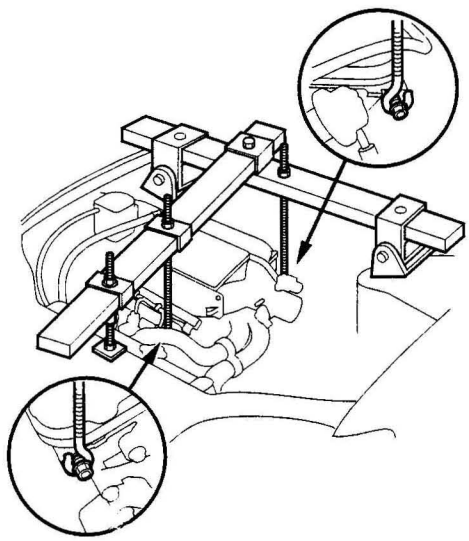
(cont'd)

BACK

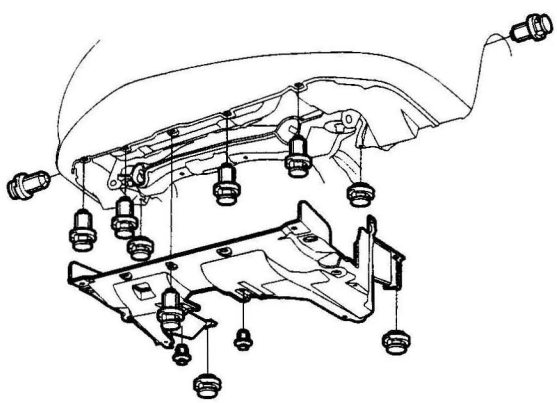
Protected by AR

Transmission Removal (cont'd)

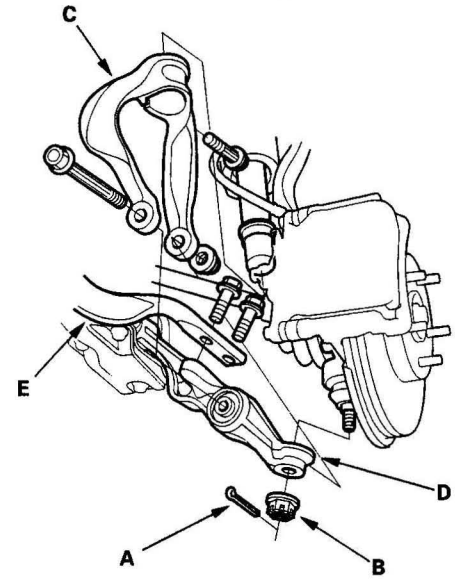
23. Lift and support the engine/transmission assembly with an engine hanger (P/N AAR-T-12566, available through the American Honda Tool and Equipment program, or equivalent). Before attaching the hanger, remove the front bulkhead cover (see page 20-135), and the front support beam.



24. Remove the splash shield.



25. Remove the cotter pins (A), castle nuts (B), and damper forks (C), then separate the ball joints from the lower arms (D) (see page 18-9).



26. Remove the bolts securing the radius rods (E), then separate the radius rods from the lower arms (D).

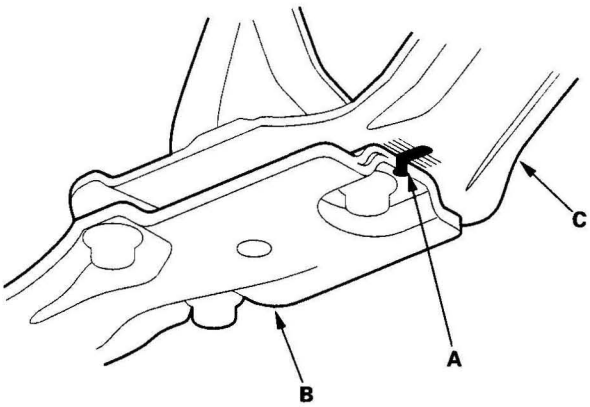
27. Pry the driveshafts out of the differential and the intermediate shaft (see step 10 on page 16-4).

28. Pull on the inboard joints to remove the left driveshaft from the differential and to remove the right driveshaft from the intermediate shaft.

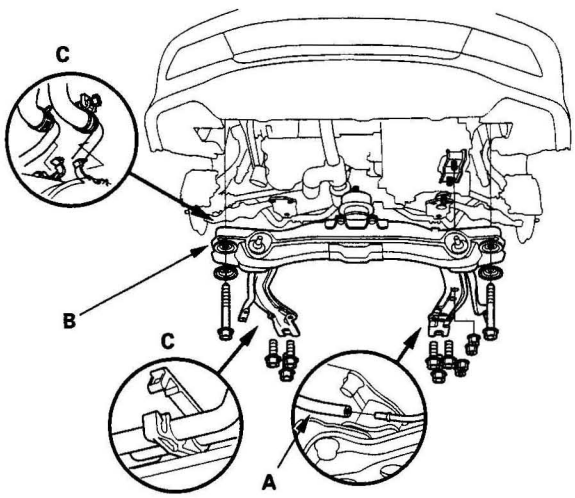
BACK

Protected by AR

29. Make a reference mark (A) across the front beam (B) and the rear beam (C).

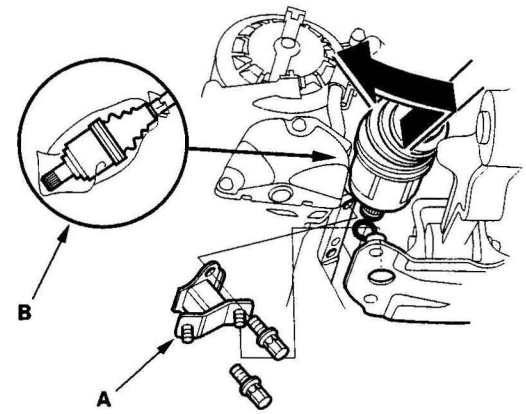


30. Disconnect the vacuum tube (A) on the front beam (B), and unclamp the power steering fluid pipes (C) from the clamps on the front beam.



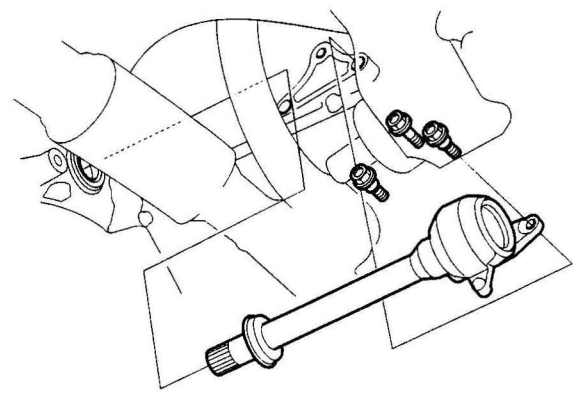
31. Remove the nuts securing the transmission lower mounts, then remove the front beam (B).

32. Remove the transmission lower rear mount (A) from the transmission.



33. Move the left driveshaft to the front side. Coat all precision finished surfaces with clean engine oil, then tie the plastic bags (B) over the driveshaft ends.

34. Remove the intermediate shaft.



35. Coat all precision finished surfaces with clean engine oil, then tie the plastic bags over both ends of intermediate shaft.

(cont'd)

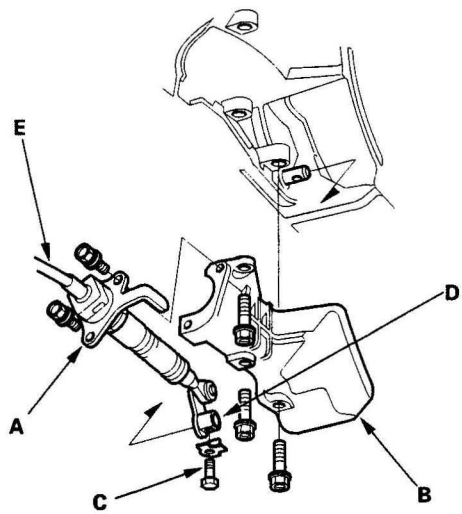
BACK

Protected by AR

Transmission Removal (cont'd)

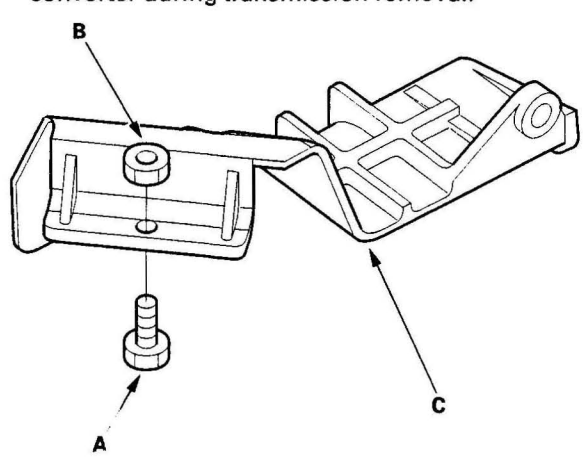
36. Remove the bolts securing shift cable holder (A), then remove shift cable cover (B).

    NOTE: To prevent damage to the control lever joint, remove the bolts securing the holder before removing the bolts securing the cover.

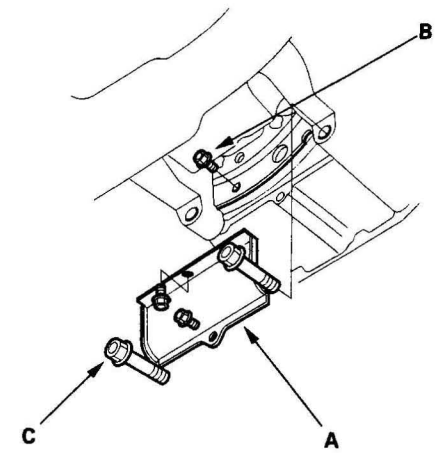


37. Remove the lock bolt (C) securing the control lever (D), then remove the shift cable (E) with the control lever. Do not bend the shift cable excessively.

38. Install a 6 x 1.0 x 14 mm bolt (A) and nut (B) on the shift cable cover (C), then reinstall the shift cable cover to the torque converter housing.
    If you don't do this, the bolt head of the cable cover may prevent you from removing the torque converter during transmission removal.

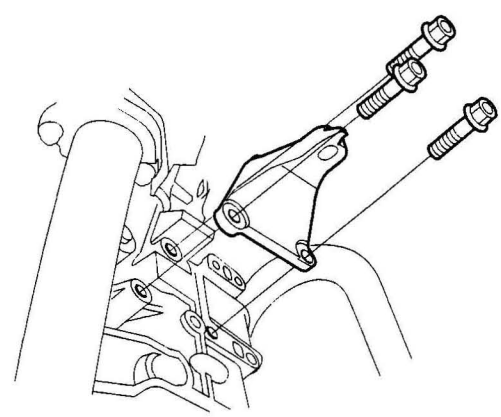


39. Remove the torque converter cover (A), then remove the eight drive plate bolts (B) one at a time while rotating the crankshaft pulley.



40. Remove the engine stiffener bolts (C).

41. Remove the front mount bracket.

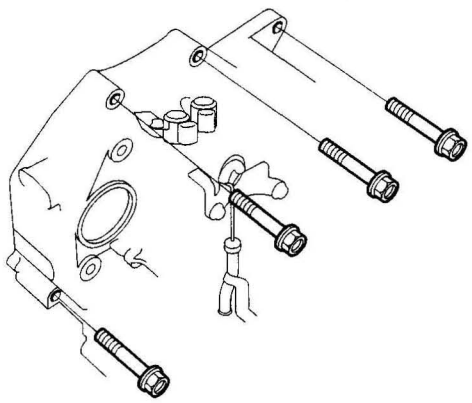


BACK

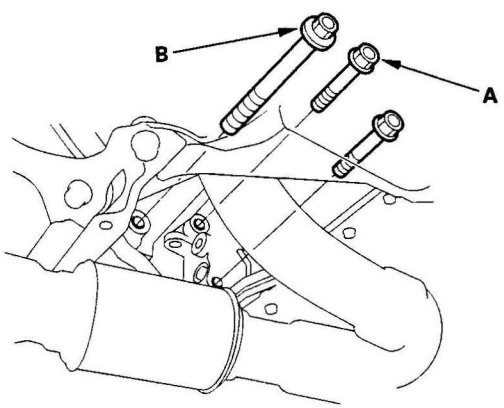
Protected by AR

42. Place a jack under the transmission.

43. Remove the transmission housing mounting bolts.



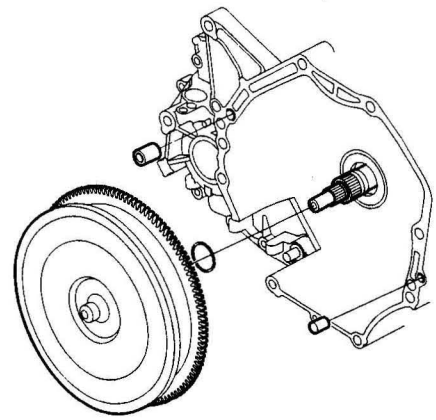
44. Remove the remaining transmission housing mounting bolts (A) and the rear mount bracket bolt (B).



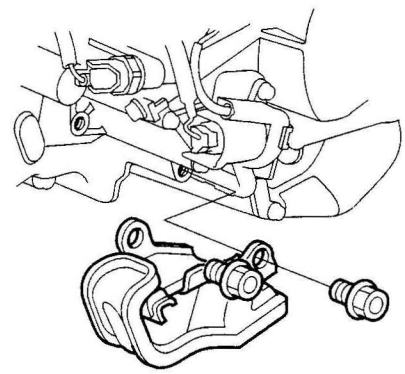
45. Pull the transmission away from the engine until it clears the dowel pins, then lower it on the transmission jack.

    NOTE: If the torque converter is stuck to the drive plate, pull it toward the transmission housing through the starter opening.

46. Remove the shift cable cover, then remove the torque converter assembly from the torque converter housing.



47. Remove the transmission lower front mount.



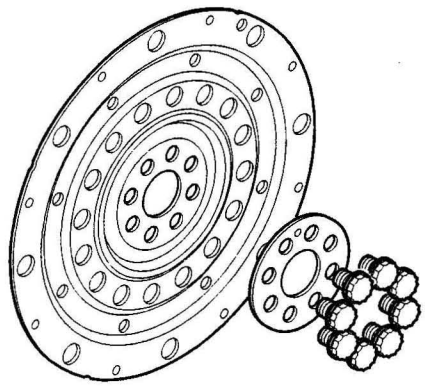
(cont'd)

BACK

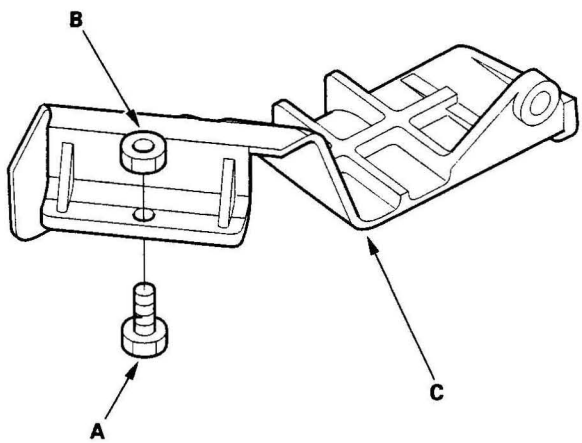
Protected by AR

Transmission Removal (cont'd)

48. Inspect the drive plate, and replace it if it's damaged.



49. Remove the 6 x 1.0 x 14 mm bolt (A) and nut (B) from the shift cable cover (C).

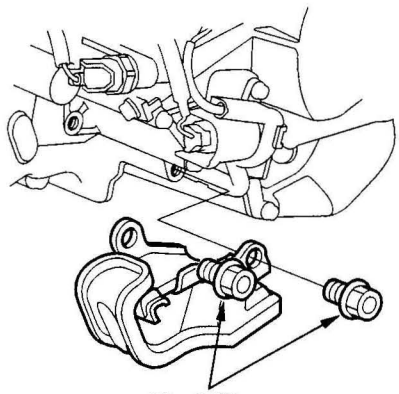


BACK

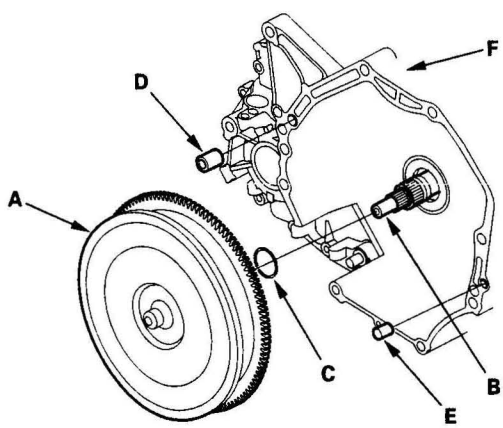
Protected by AR

Transmission Installation

1. Install the transmission lower front mount.



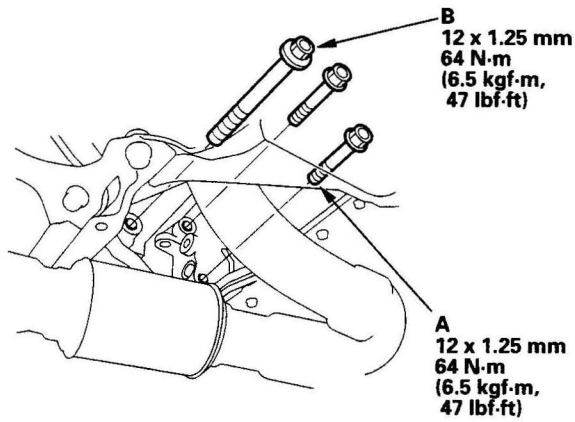
2. Install the torque converter assembly (A) on the mainshaft (B) with a new O-ring (C).



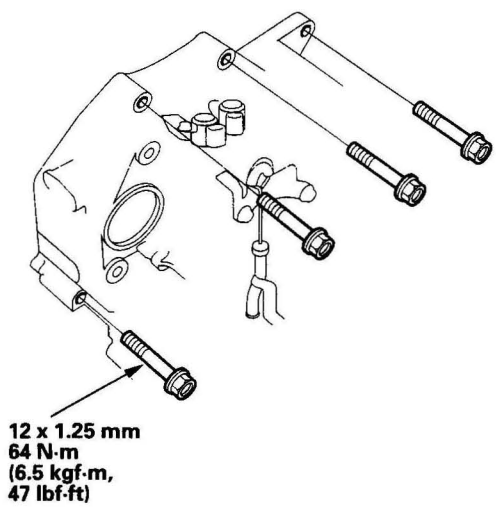
3. Install the 14 mm dowel pin (D) and 10 mm dowel pin (E) in the torque converter housing (F).

4. Place the transmission on a jack, and raise it to engine level.

5. Attach the transmission to the engine, then install the transmission housing mounting bolts (A) and rear mount bracket bolt (B).



6. Install the transmission housing mounting bolts.



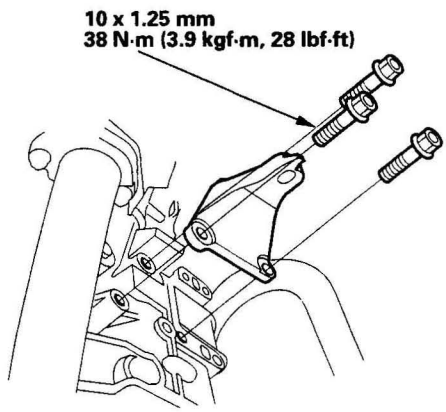
(cont'd)

BACK

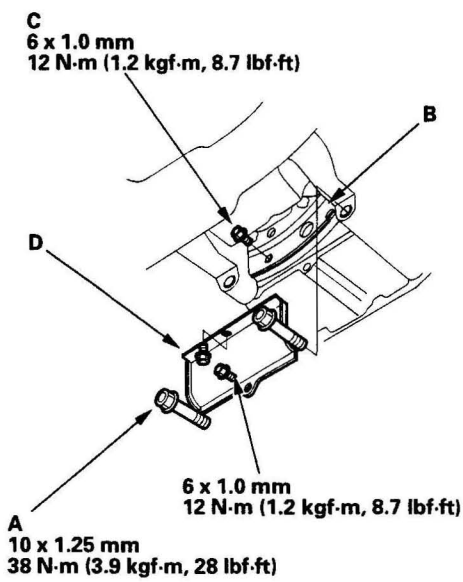
Protected by AR

Transmission Installation (cont'd)

7. Install the front mount bracket.



8. Install the engine stiffener mounting bolts (A).

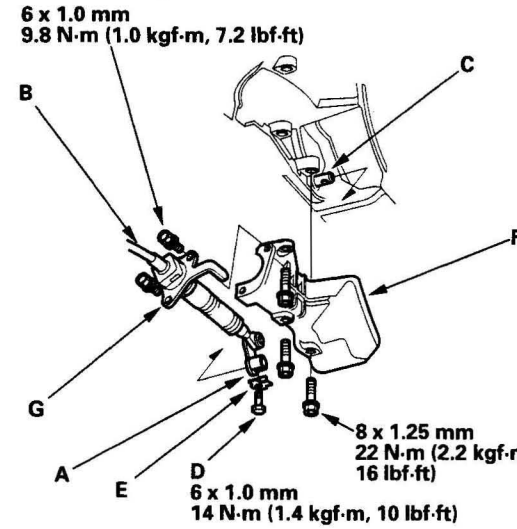


9. Attach the torque converter to the drive plate (B) with eight bolts (C). Rotate the crankshaft pulley as necessary to tighten the bolts to 1/2 of the specified torque, then to the final torque, in a crisscross pattern. After tightening the last bolt, check that the crankshaft rotates freely.

10. Install the torque converter cover (D).

11. Tighten the crankshaft pulley bolt as necessary (see step 2 on page 6-16).

12. Install the control lever (A) with the shift cable (B) on the control shaft (C). Do not bend the shift cable excessively.

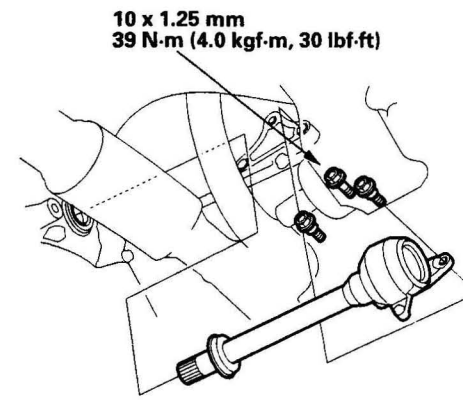


13. Install the lock bolt (D) with a new lock washer (E), then bend the lock washer tab against the bolt.

14. Install the shift cable cover (F), then install the shift cable holder (G) on the shift cable cover.

    NOTE: To prevent damage to the control lever joint, be sure to install the shift cable holder after installing the shift cable cover to the torque converter housing.

15. Clean the areas where the intermediate shaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air. Then install the intermediate shaft in the differential. While installing the intermediate shaft, be sure not to allow dust or other foreign particles to enter the transmission.



BACK

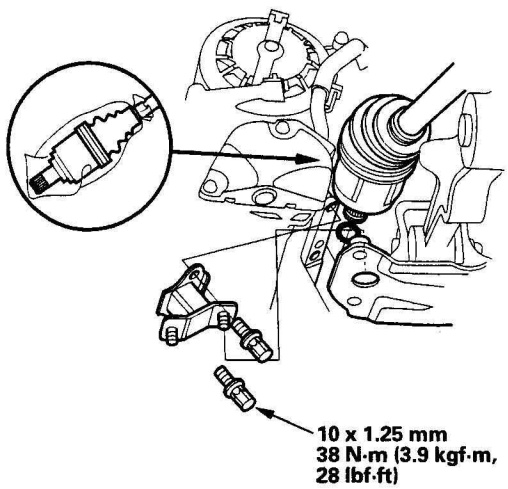
Protected by AR

16. Install new set rings on the right and left driveshafts.

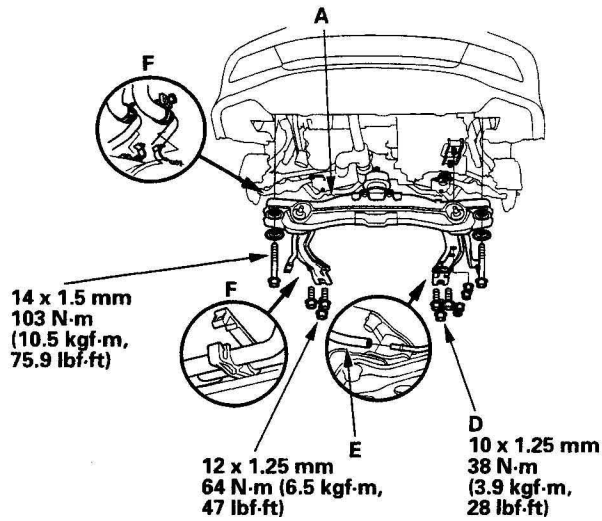
17. Install the right and left driveshafts (see page 16-19). While installing the left driveshaft in the differential, be sure not to allow dust or other foreign particles to enter the transmission.

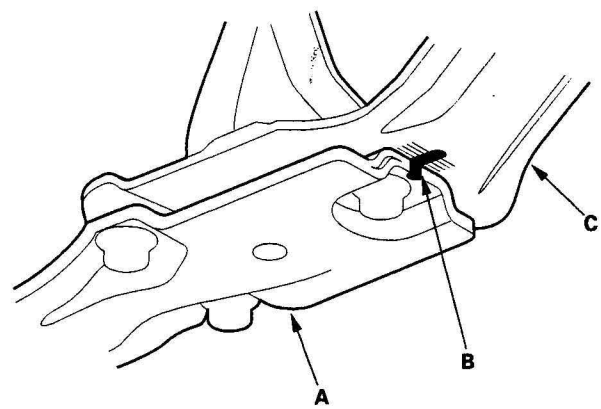
    NOTE:
    - Clean the areas where the left driveshaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air.
    - Turn the both steering knuckles fully outward, and slide the left driveshaft into the differential until you feel its spring clip engage the side gear. Slide the right driveshaft into the intermediate shaft until you feel its spring clip engage the intermediate shaft.

18. Install the transmission lower rear mount on the transmission.



19. Install the front beam (A) by aligning both reference marks (B) on both rear beams (C), and tighten the bolts.





20. Install the transmission lower mount nuts (D).

21. Connect the vacuum tube (E), and install the power steering fluid pipe (F) on its clamp.

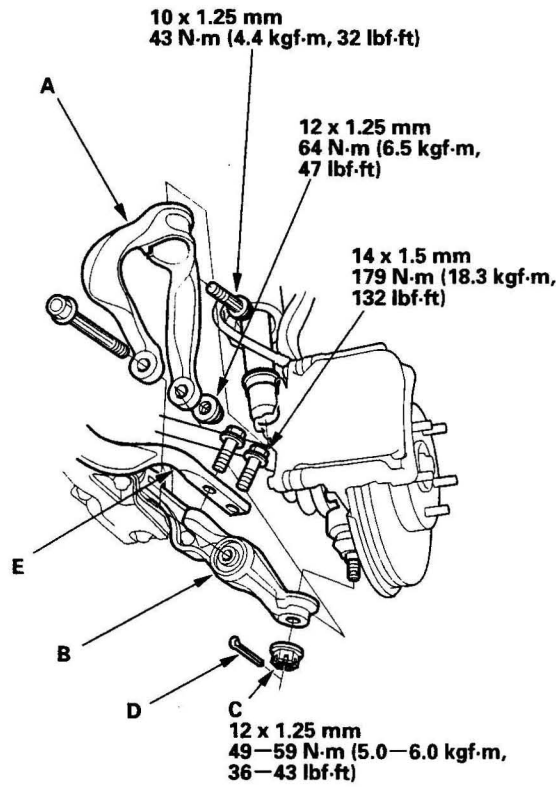
(cont'd)

BACK

Protected by AR

Transmission Installation (cont'd)

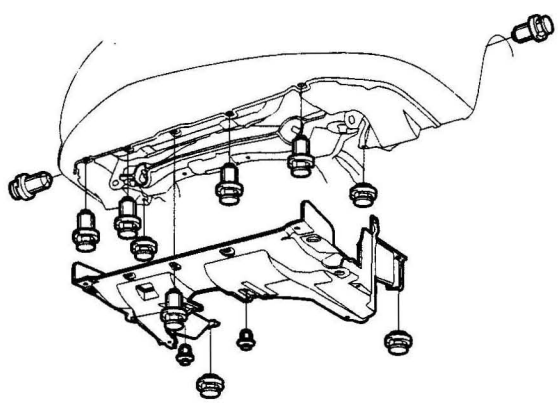
22. Install the damper forks (A), then install the ball joints on each lower arm (B) with the castle nuts (C) and new cotter pins (D).



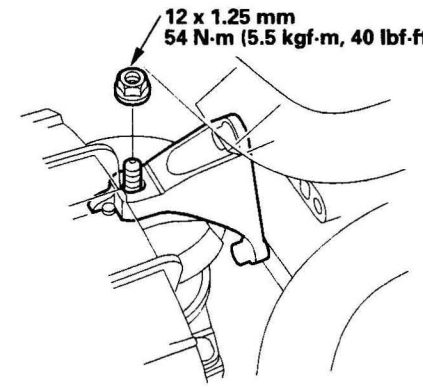
23. Install the radius rods (E) on each lower arm.

24. Remove the jack from the transmission.

25. Install the splash shield.

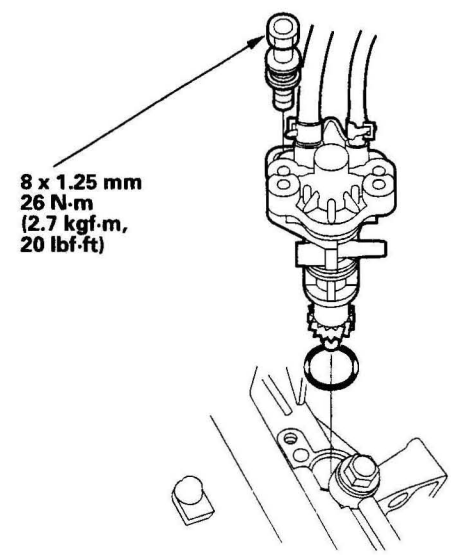


26. Install and tighten the nut on the front mount.



27. Remove the engine hanger from the engine.

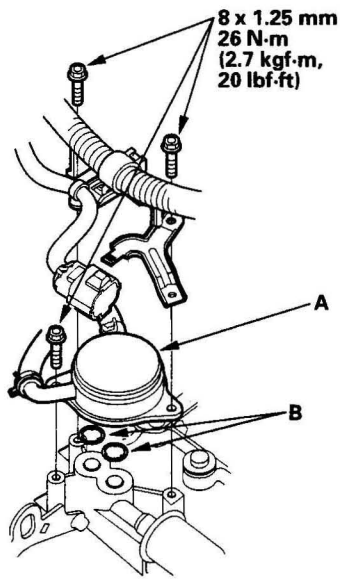
28. Only for Premium; Install the power steering speed sensor.



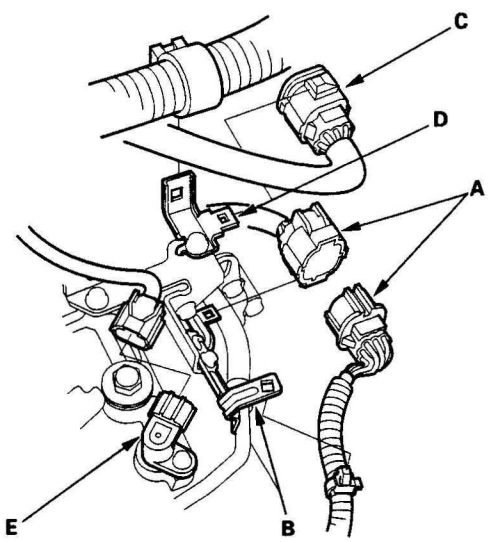
BACK

Protected by AR

29. Install the ATF warmer (A) with new O-rings (B) on the transmission housing. Do not pinch the O-rings.



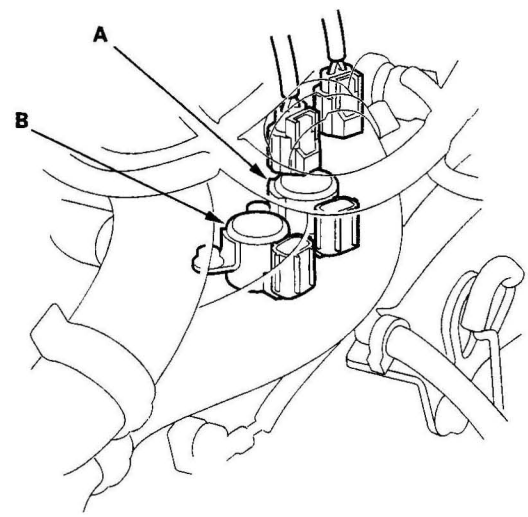
30. Connect the transmission range switch connector (A), then install it on its connector bracket (B). Install the harness clamp on the bracket.



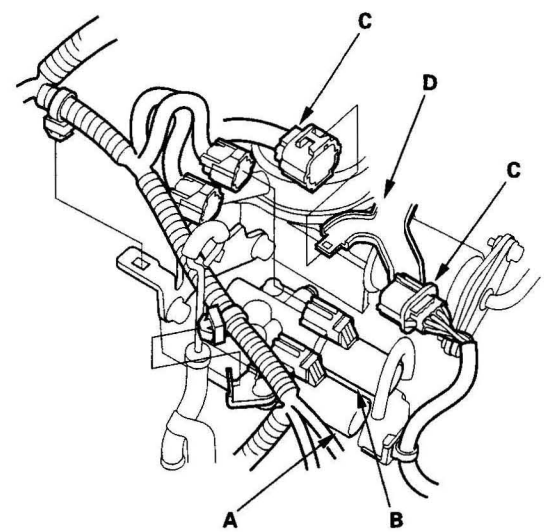
31. Install the joint connector (C) on its connector bracket (D).

32. Connect the connector to the countershaft speed sensor (E).

33. Connect the connectors to the torque converter clutch solenoid valve (A) and shift solenoid valve B (B).



34. Connect the connectors to A/T clutch pressure control solenoid valves A and B, then install the harness clamp on the bracket.



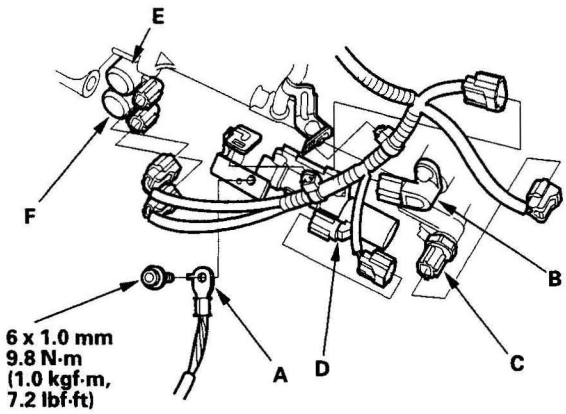
35. Connect the 8P connector (C), then install it on its connector bracket (D).

(cont'd)

Protected by AR

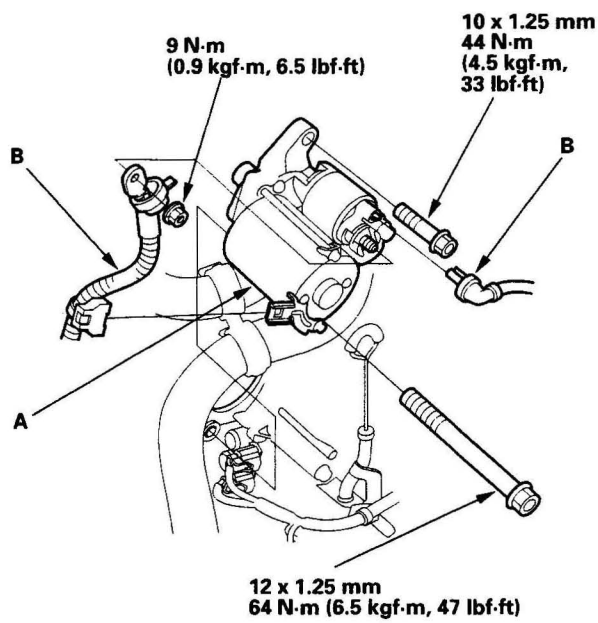
Transmission Installation (cont'd)

36. Install the transmission ground cable (A).



37. Connect the connectors to the mainshaft speed sensor (B), 4th clutch pressure switch (C), A/T clutch pressure control solenoid valve C (D), and shift solenoid valves A (E) and C (F), then install the harness clamps on the clamp brackets. Do not allow water, fluid, oil, dust, or other foreign particles to enter any of the connectors.

38. Install the starter (A) on the torque converter housing. Connect the starter cables (B) to the starter, and install the harness clamp on the clamp bracket. Make sure the crimped side of the starter cable ring terminal facing out.

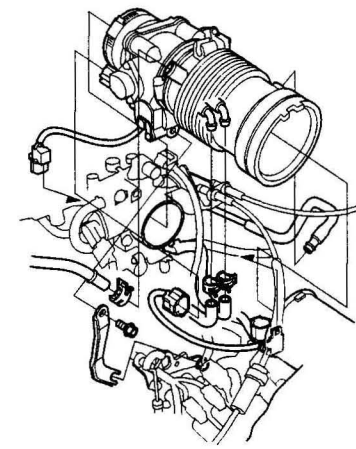


39. Install the battery base bracket and battery base.

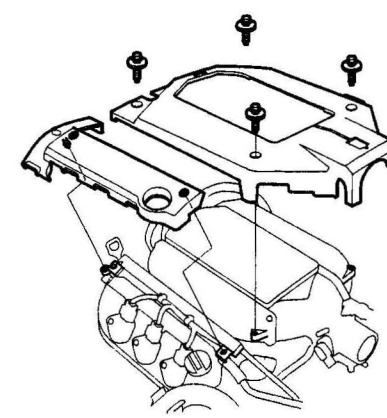
40. Install the battery cable clamps on the battery base.

41. Install the battery tray and battery, then secure the battery with its hold-down bracket.

42. Install the intake air duct.
    - Premium; Install the intake air duct.
    - Type S; Install the intake air duct-TCS control valve assembly.



43. Install the rear engine cover and the front engine cover.



BACK

Protected by AR

44. Install the front strut support beam (torque 22 N·m, 2.2 kgf·m, 22 lbf·ft), and the front bulkhead cover (see page 20-135).

45. Refill the transmission with ATF (see page 14-350).

46. Connect the battery positive terminal, then connect the negative terminal.

47. Set the parking brake. Start the engine, and shift the transmission through all gears three times.

48. Check the shift lever operation, A/T gear position indicator operation, and shift cable adjustment.

49. Check and adjust the front wheel alignment (see page 18-5).

50. Reattach the right and left hood support struts.

51. Let the engine reach normal operating temperature (the radiator fan comes on) with the transmission in the P or N position, and continue to run the engine at idle for more than 5 minutes to calibrate the engine idle control system in the PCM (see page 11-158).

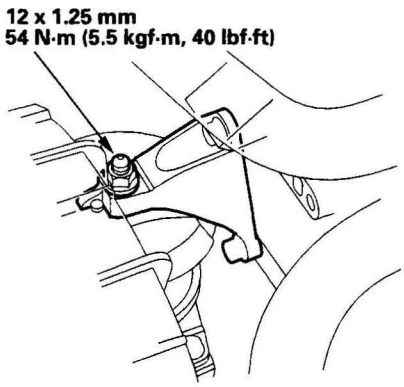
52. Turn the engine off and check the ATF level (see page 14-349).

53. Perform the power window control unit reset procedure ('02-03 models) (see page 22-308).

54. Perform a road test (see page 14-334).

55. Enter the anti-theft codes for the radio and the navigation system, then enter the radio station presets, and set the clock.

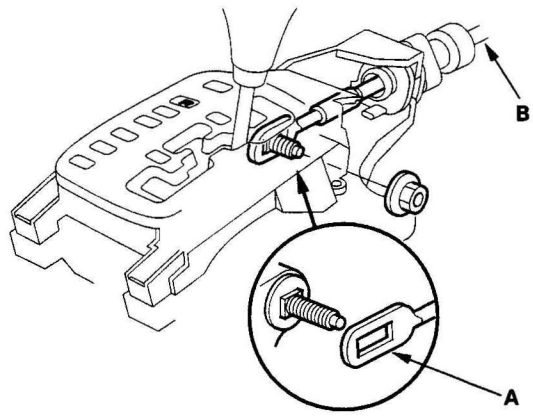
56. Loosen the front mount nut after the road test, then retighten the nut to the specified torque.



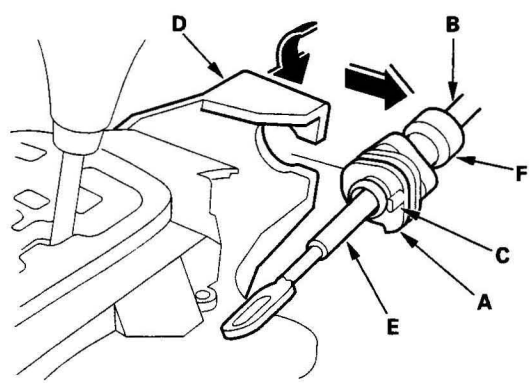
Protected by AR

Shift Lever Removal

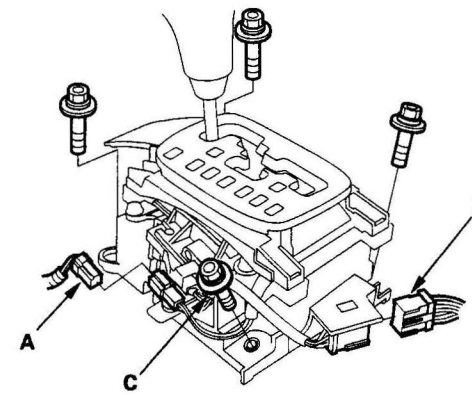
1. Shift the transmission into the R position.
2. Remove the console panel (see page 20-63).
3. Remove the nut securing the shift cable end (A), then separate the end from the shift lever assembly.



4. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening of the shift lever bracket base (D). Then slide the holder to remove the shift cable from the shift lever bracket base (D). Do not remove the shift cable by twisting the shift cable guide (E) and damper (F).



5. Disconnect the shift lock solenoid connector (A) and the transmission gear selection switch connector (B).



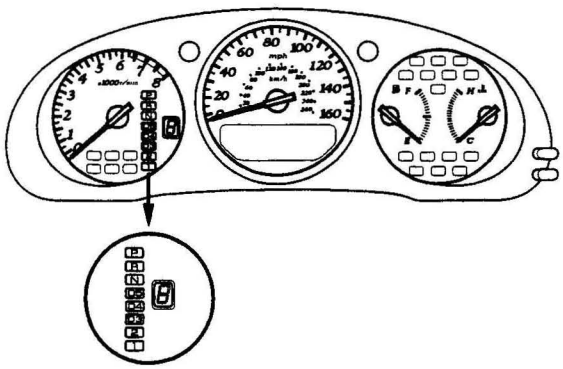
6. Remove the four bolts (C) securing the shift lever bracket base, then remove the shift lever assembly.

BACK

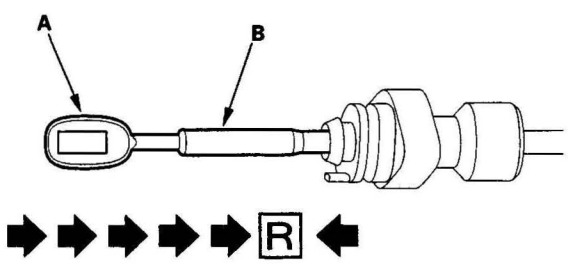
Protected by AR

Shift Lever Installation

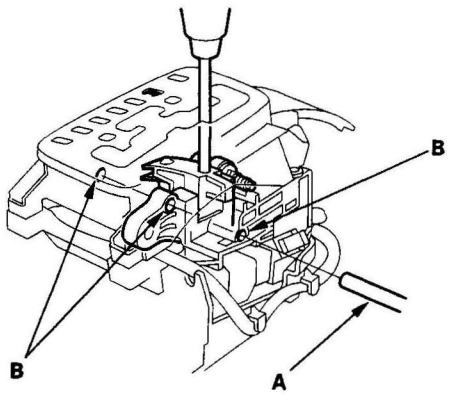
1. Install the shift lever assembly.
2. Turn the ignition switch ON (II), and verify that the R position indicator comes on.



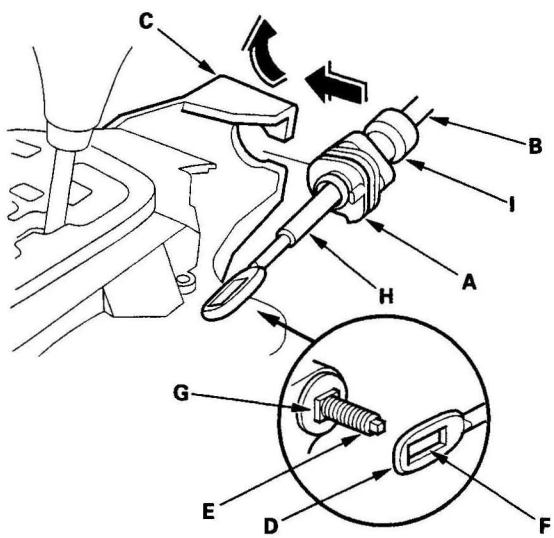
3. If necessary, push the shift cable (A) until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in R. Do not push and pull the shift cable by holding the shift cable guide (B).



4. Turn the ignition switch OFF.
5. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole on the shift lever assembly. The shift lever is secured in the R position.



6. Align the socket holder (A) on the shift cable (B) with the slot in the bracket base (C), then slide the holder into the base. Install the shift cable end (D) over the mounting stud (E) by aligning its square hole (F) with the square fitting (G) at the bottom of the stud. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (H) and damper (I).



(cont'd)

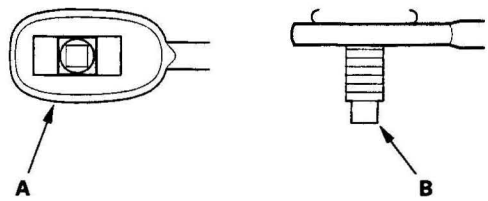
BACK

Protected by AR

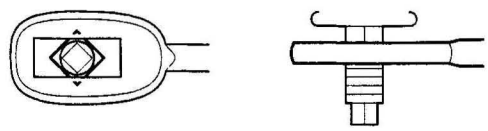
Shift Lever Installation (cont'd)

7. Verify that the shift cable end (A) is properly installed on the mounting stud (B).

Properly Installed:



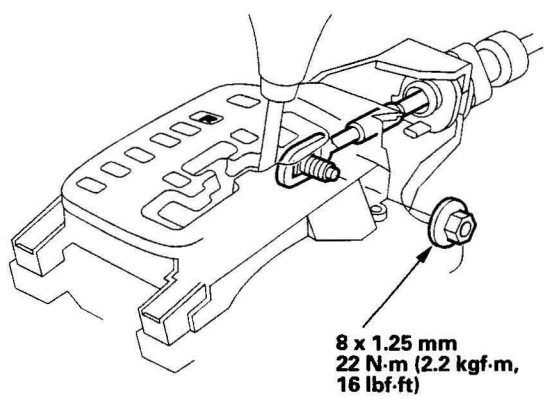
Improperly Installed:



Cable end rides on the bottom of the mounting stud.

8. If improperly installed, remove the shift cable from the shift lever bracket base, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the shift cable bracket base.

9. Install and tighten the nut.



10. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

11. Connect the shift lock solenoid connector and the transmission gear selection switch connector.

12. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

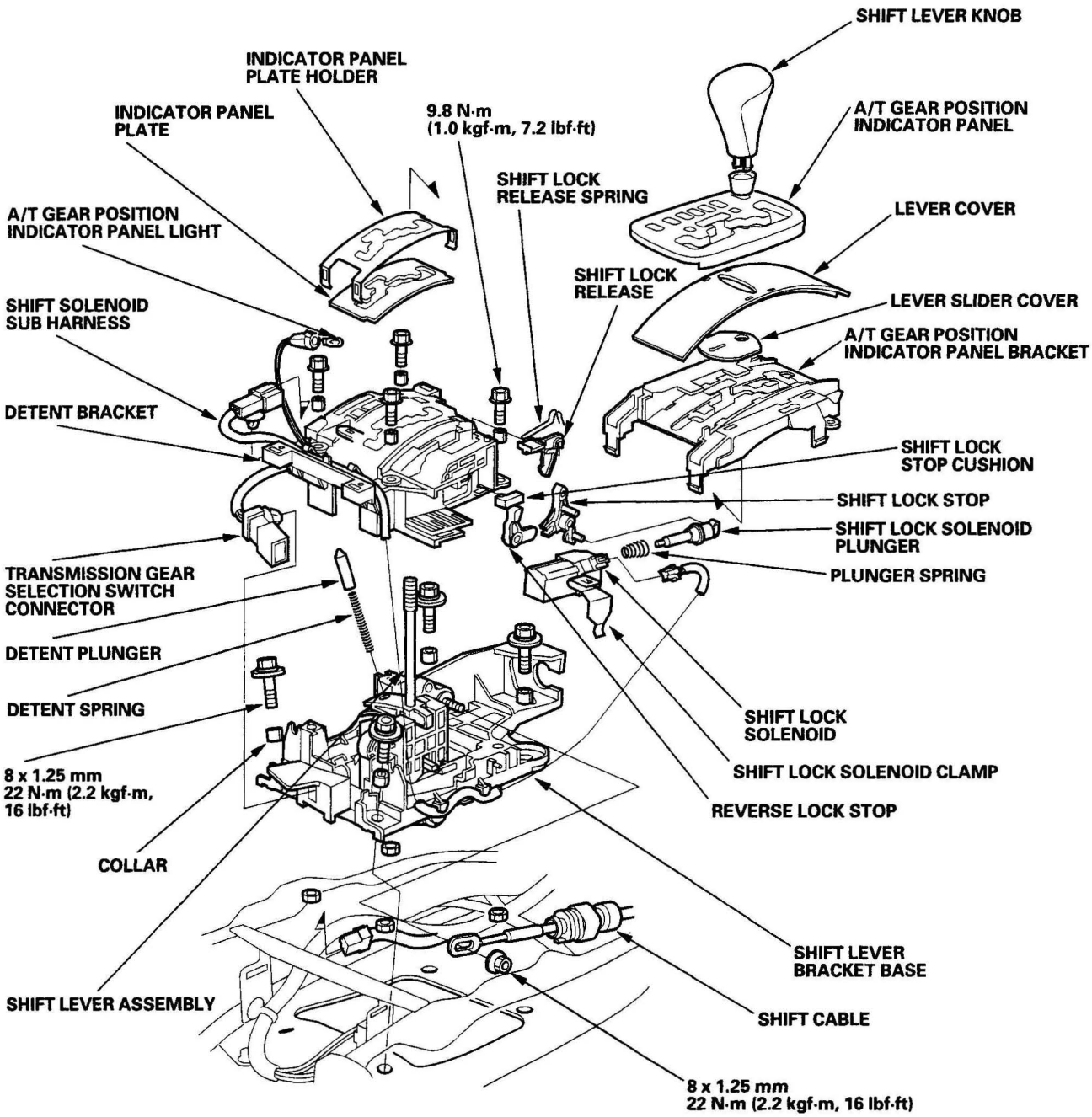
13. Push the shift lock release, and verify that the shift lever releases.

BACK

Protected by AR

Shift Lever Disassembly/Reassembly

Apply silicone grease to these parts:
- Movable parts of the shift lever.
- Movable parts of the shift lock/reverse lock mechanism.
- Sliding surfaces on the opening of the indicator panel and panel holder.
- Sliding surfaces on the detent plate.
- Contact surfaces between of the shift lever assembly and the shift lock stop.
- Detent plunger and detent spring.

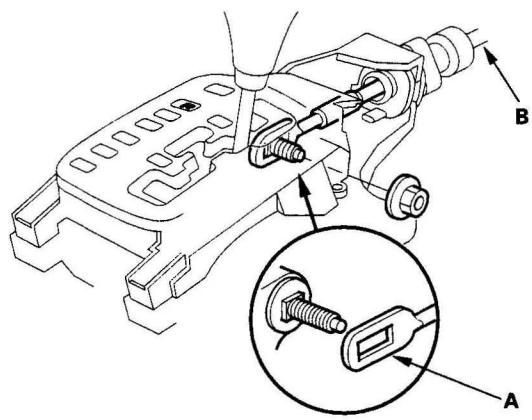


BACK

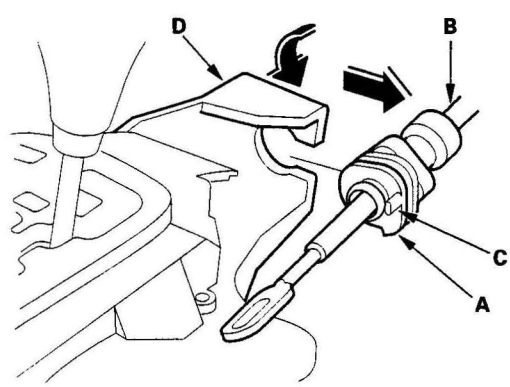
Protected by AR

Shift Cable Replacement

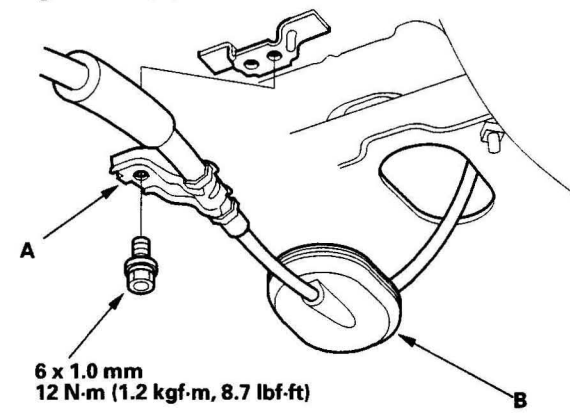
1. Raise the front of the vehicle, and make sure it is securely supported (see page 1-14).
2. Set the parking brake, and block the rear wheels securely.
3. Shift the transmission into the R position.
4. Remove the console panel (see page 20-63).
5. Remove the nut securing the shift cable end (A), then separate the end from the shift lever assembly.



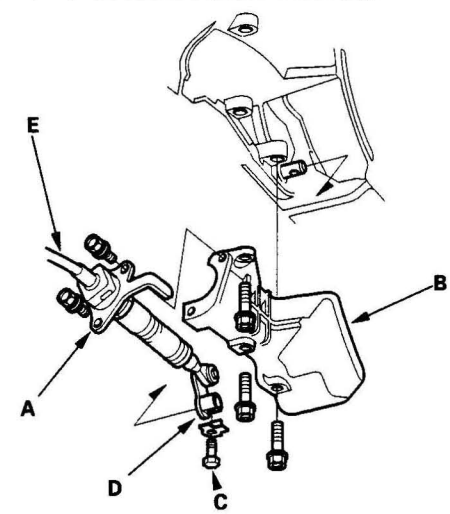
6. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening of the shift lever bracket base (D). Then slide the holder to remove the shift cable from the shift lever bracket base (D).



7. Remove the floor heat shield.
8. Remove the shift cable guide bracket (A) and grommet (B).



9. Remove the bolts securing the shift cable holder (A), then remove the shift cable cover (B).



10. Remove the lock bolt (C) securing the control lever (D), then remove the shift cable (E) with the control lever.

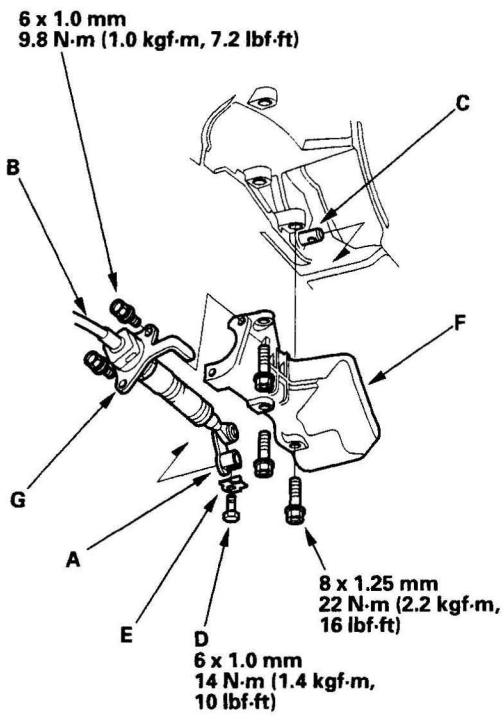
BACK

Protected by AR

11. Insert the new shift cable through the grommet hole, then install the shift cable guide bracket.

12. Verify that the transmission is in the [R] position on the control shaft.

13. Install the control lever (A) with the shift cable (B) on the control shaft (C). Do not bend the shift cable excessively.



14. Install the lock bolt (D) with a new lock washer (E), then bend the lock washer tab against the bolt.

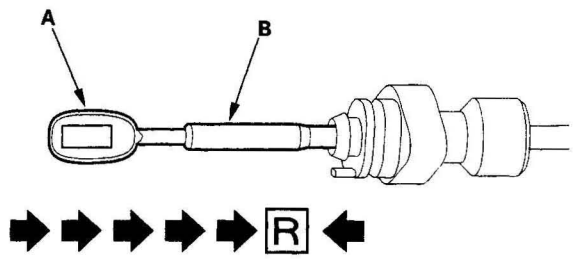
15. Install the shift cable cover (F), then install the shift cable holder (G) on the cover.

    NOTE: To prevent damage to the control lever joint, be sure to install the shift cable holder after installing the shift cable cover to the torque converter housing.

16. Install the floor heat shield.

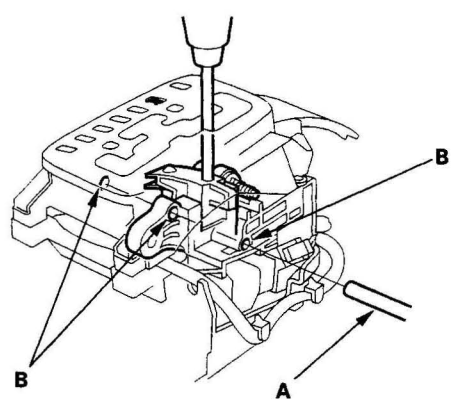
17. Turn the ignition switch ON (II), and verify that the [R] position indicator comes on.

18. If necessary, push the shift cable (A) until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in [R]. Do not push and pull the shift cable by holding the shift cable guide (B).



19. Turn the ignition switch OFF.

20. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole on the shift lever assembly. The shift lever is secured in the [R] position.

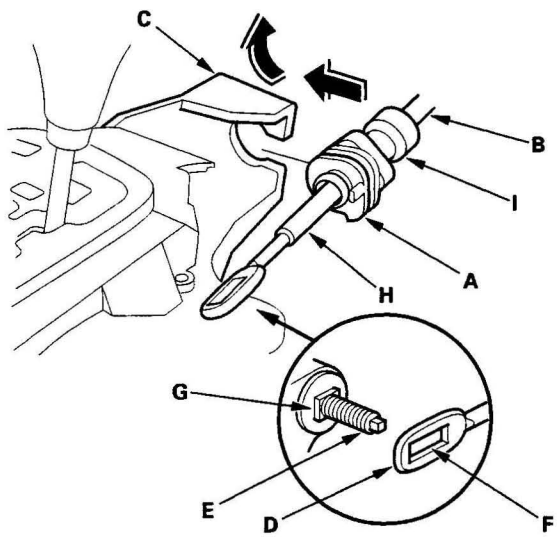


(cont'd)

Protected by AR

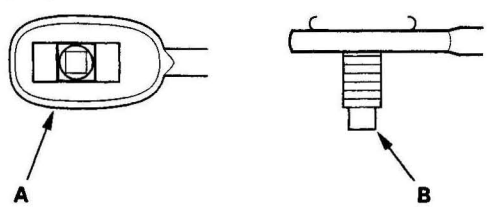
Shift Cable Replacement (cont'd)

21. Align the socket holder (A) on the shift cable (B) with the slot in the bracket base (C), then slide the holder into the base. Install the shift cable end (D) over the mounting stud (E) by aligning its square hole (F) with the square fitting (G) at the bottom of the stud. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (H) and damper (I).

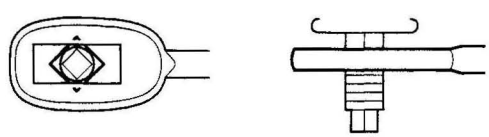


22. Verify that the shift cable end (A) is properly installed on the mounting stud (B).

Properly installed:



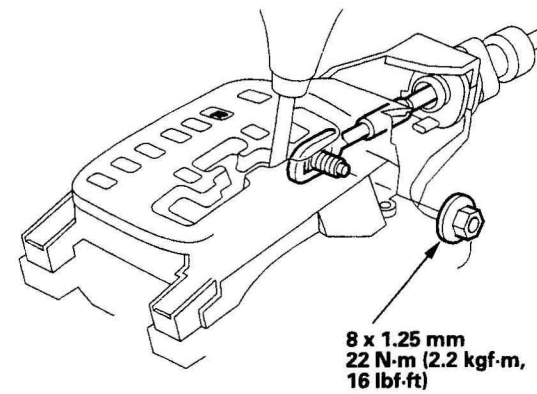
Improperly installed:



Cable end rides on the bottom of the mounting stud.

23. If improperly installed, remove the shift cable from the shift lever bracket base, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the shift cable bracket base.

24. Install and tighten the nut.



25. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

26. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

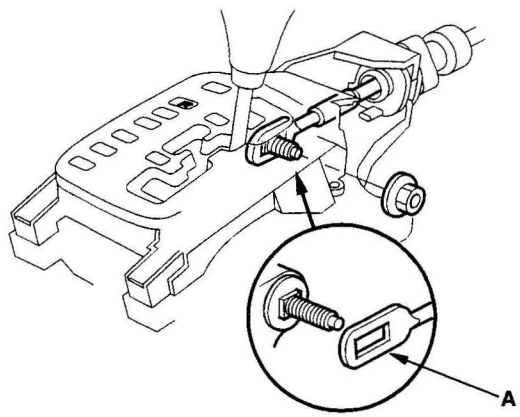
27. Start the engine, and check the shift lever operation in all gears.

BACK

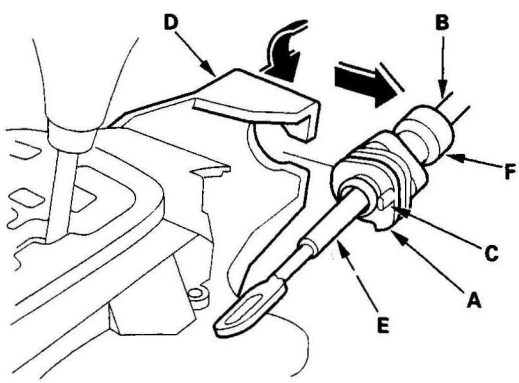
Protected by AR

Shift Cable Adjustment

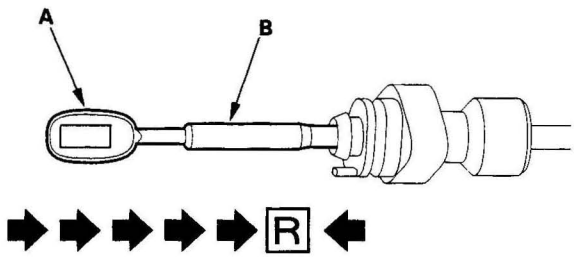
1. Shift the transmission into the [R] position.
2. Remove the console panel (see page 20-63).
3. Remove the nut securing the shift cable end (A), then separate the end from the shift lever assembly.



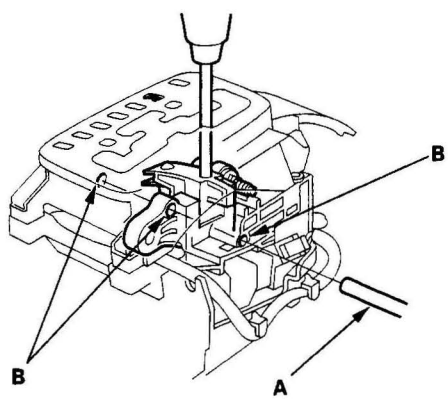
4. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening of the shift lever bracket base (D). Then slide the holder to remove the shift cable from the shift lever bracket base (D). Do not remove the shift cable by twisting the shift cable guide (E) and damper (F).



5. Push the shift cable (A) until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in [R]. Do not push and pull the shift cable by holding the shift cable guide (B).



6. Turn the ignition switch ON (II), and verify that the [R] position indicator comes on.
7. Turn the ignition switch OFF.
8. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole on the shift lever assembly. The shift lever is secured in the [R] position.

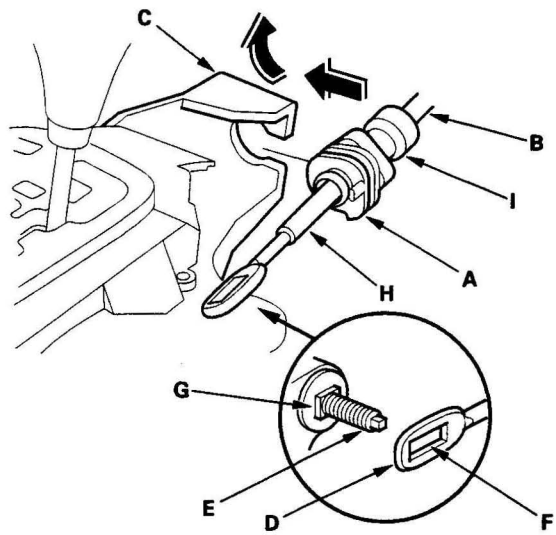


(cont'd)

Protected by AR

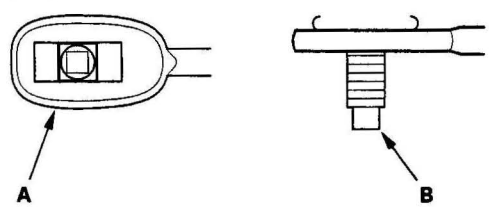
Shift Cable Adjustment (cont'd)

9. Align the socket holder (A) on the shift cable (B) with the slot in the bracket base (C), then slide the holder into the base. Install the shift cable end (D) over the mounting stud (E) by aligning its square hole (F) with the square fitting (G) at the bottom of the stud. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (H) and damper (I).

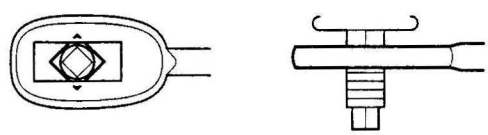


10. Verify that the shift cable end (A) is properly installed on the mounting stud (B).

Properly Installed:



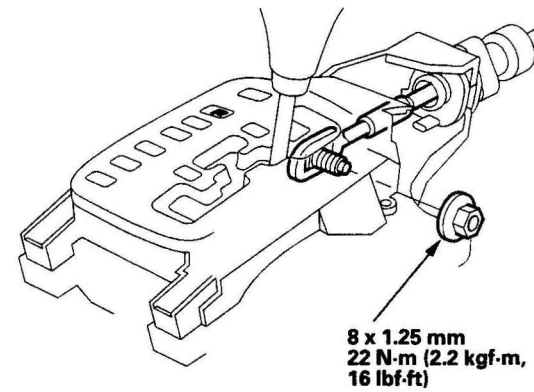
Improperly Installed:



Cable end rides on the bottom of the mounting stud.

11. If improperly installed, remove the shift cable from the shift lever bracket base, and reinstall the shift cable. Do not install the shift cable end on the mounting stud while the shift cable is on the shift cable bracket base.

12. Install and tighten the nut.



13. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

14. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

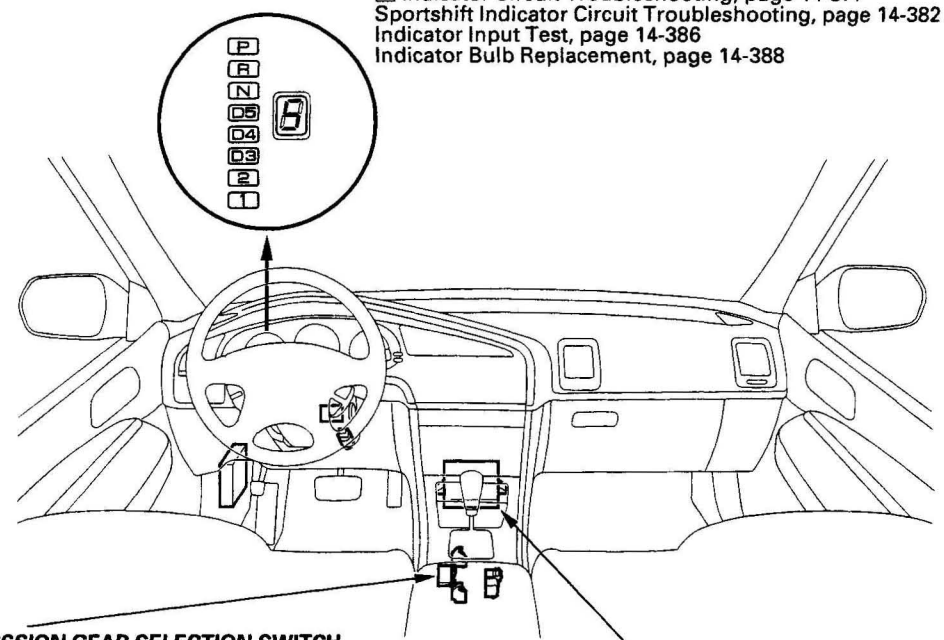
15. Push the shift lock release, and verify that the shift lever releases.

BACK

Protected by AR

A/T Gear Position Indicator

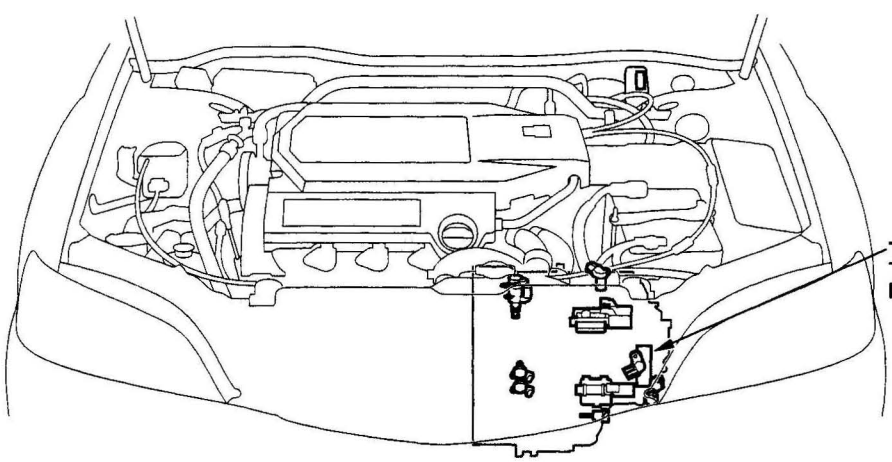
Component Location Index



A/T GEAR POSITION INDICATOR
Ds Indicator Circuit Troubleshooting, page 14-377
Sportshift Indicator Circuit Troubleshooting, page 14-382
Indicator Input Test, page 14-386
Indicator Bulb Replacement, page 14-388

TRANSMISSION GEAR SELECTION SWITCH
Circuit Troubleshooting, page 14-380

POWERTRAIN CONTROL MODULE (PCM)



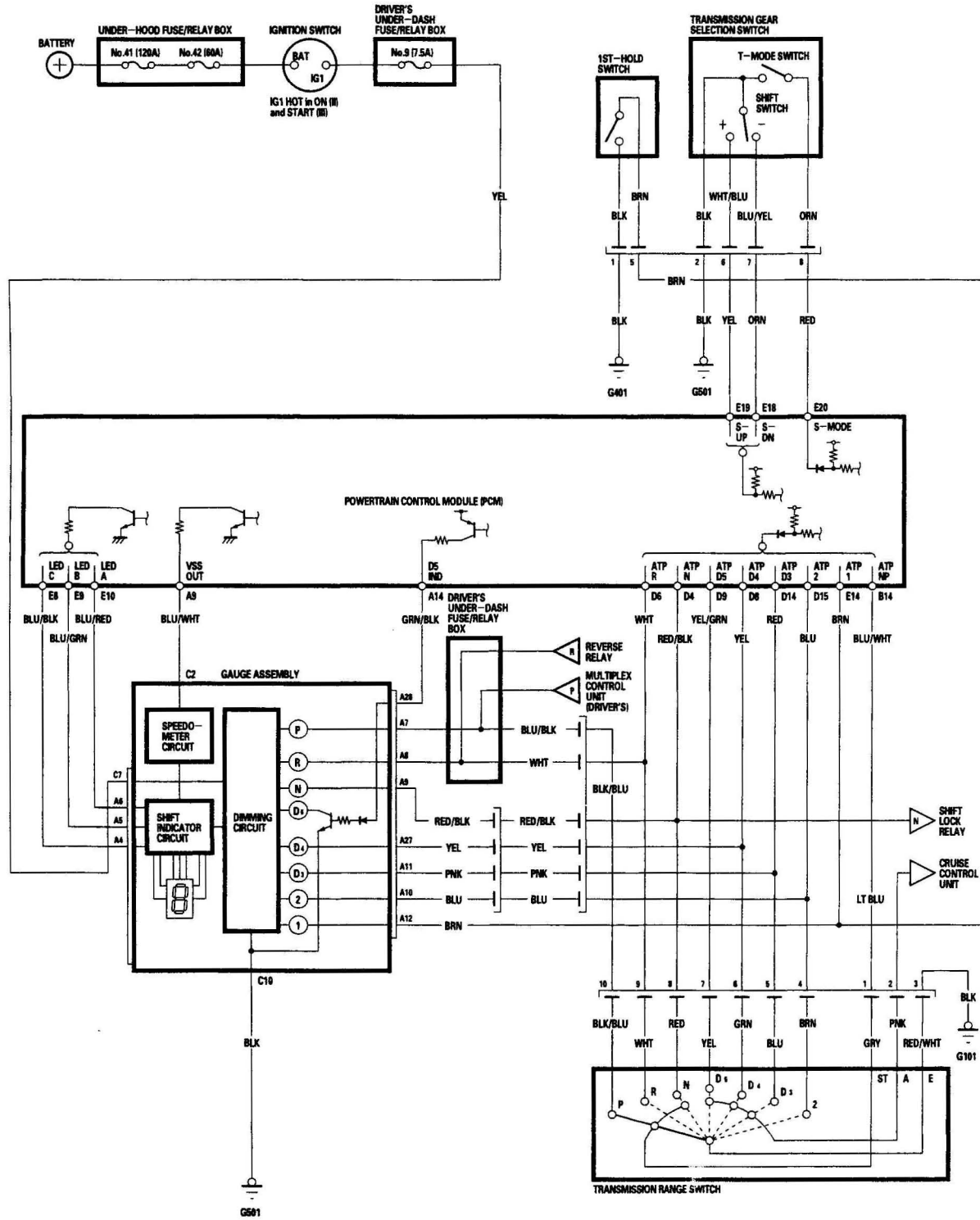
TRANSMISSION RANGE SWITCH
Test, page 14-383
Replacement, page 14-384

BACK

Protected by AR

A/T Gear Position Indicator

Circuit Diagram



BACK

Protected by AR

D5 Indicator Circuit Troubleshooting

1. Turn the ignition switch ON (II), and watch the D5 indicator.

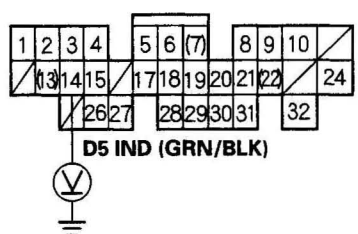
   Does the D5 indicator come on and stay on?

   YES – Go to step 2.

   NO – If the indicator comes on for about 2 seconds and then goes off, it's OK. If it doesn't come on at all, go to step 12.

2. Make sure the Honda PGM Tester is not connected to the data link connector.
3. Turn the ignition switch OFF.
4. Disconnect PCM connector A (32P).
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminal A14 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals

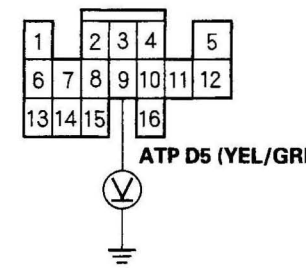
Is there voltage?

YES – Repair short to power in the wire between PCM connector terminal A14 and the gauge assembly. ■

NO – Go to step 7.

7. Turn the ignition switch OFF.
8. Reconnect PCM connector A (32P).
9. Turn the ignition switch ON (II).
10. Shift to any position other than D5.
11. Measure the voltage between PCM connector terminal D9 and body ground.

PCM CONNECTOR D (16P)



Wire side of female terminals

Is there voltage?

YES – Faulty PCM or gauge assembly. ■

NO – Check for a short to ground in the wire between PCM connector terminal D9 and the transmission range switch. If the wire is OK, check the transmission range switch. ■

12. Make sure the Honda PGM Tester is not connected to the data link connector.
13. Shift to the D5 position.

    Does the D5 indicator come on?

    YES – Check for loose terminal fit in PCM connector A14 and recheck the D5 indicator several times. If the problem is intermittent, substitute a known-good PCM and recheck. If the indicator then works OK every time, replace the original PCM. ■

    NO – Go to step 14.

14. Turn the ignition switch OFF.

(cont'd)

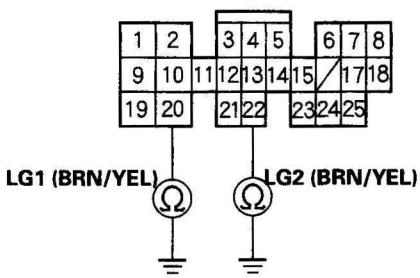
Protected by AR

D5 Indicator Circuit Troubleshooting (cont'd)

15. Disconnect PCM connector B (25P).

16. Check for continuity between body ground and PCM connector terminals B20 and B22.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity between ground and each terminal?

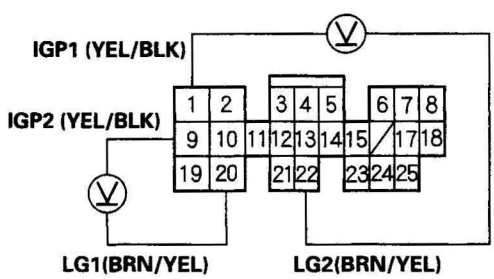
YES – Go to step 17.

NO – Repair open in the wire(s) between PCM connector terminal B20 or B22 and ground (G101). Repair poor ground (G101). ■

17. Turn the ignition switch ON (II).

18. Measure the voltage between PCM connector terminals B1 and B22, and between terminals B9 and B20.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 19.

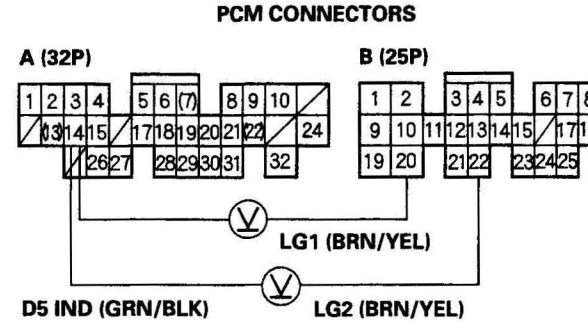
NO – Repair open or short in the wire between PCM connector terminal B1 or B9 and the PGM-FI main relay. ■

19. Turn the ignition switch OFF.

20. Reconnect PCM connector B (25P).

21. Connect a digital multimeter between PCM connector terminals A14 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

22. Turn the ignition switch ON (II).

Is there voltage for at least 2 seconds?

YES – Check for an open in the wire between PCM connector terminal A14 and the gauge assembly. If the wire is OK, check for a faulty D5 indicator bulb or a faulty printed circuit board in the gauge assembly. ■

NO – Go to step 23.

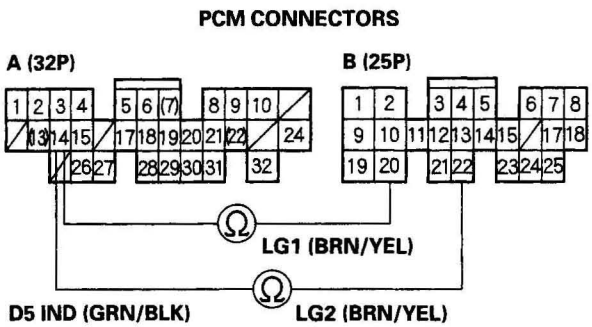
BACK

Protected by AR

23. Turn the ignition switch OFF.

24. Disconnect PCM connector A (32P).

25. Check for continuity between PCM connector terminals A14 and B20 or B22.



Wire side of female terminals

Is there continuity?

YES – Repair short in the wire between PCM connector terminal A14 and the gauge assembly. ■

NO – Check for loose terminal fit in PCM connector terminal A14. If necessary, substitute a known-good PCM and recheck. ■

BACK

Protected by AR

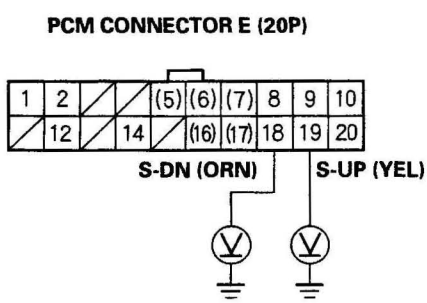
Sequential Sportshift Transmission Gear Selection Switch Circuit Troubleshooting

1. Test-drive the vehicle in the D$_S$ position, and check whether the transmission shifts up and down normally.
2. Check whether the OBD II scan tool indicates P0753, P0758, P0763, or P1709.

   Does the OBD II scan tool indicate any of the codes?

   YES – Perform the troubleshooting flowchart for the indicated code(s). ■

   NO – Go to step 3.
3. Turn the ignition switch ON (II).
4. Measure the voltage between PCM connector terminal E19 terminal and body ground, and between E18 terminal and body ground.

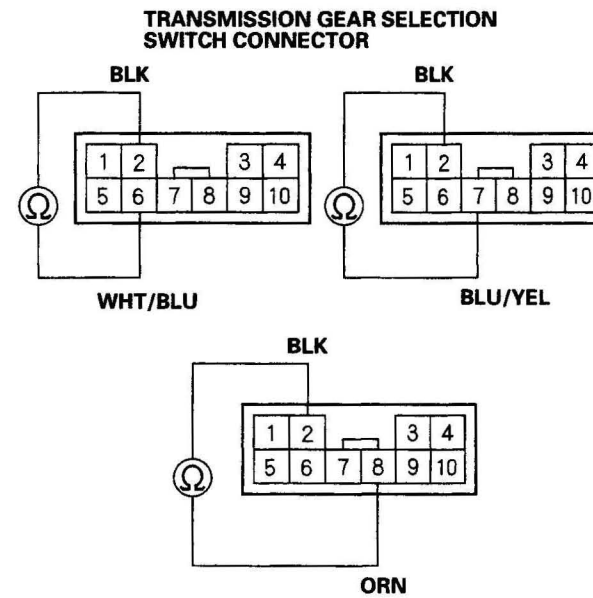


Wire side of female terminals

Is there about 5 V?

YES – Go to step 5.

NO – Run the troubleshooting flowchart for code P 1709 (see page 14-326). ■
5. Turn the ignition switch OFF.
6. Remove the center console.
7. Disconnect the transmission gear selection switch connector.
8. Check for continuity between the No. 6 and No. 2 terminals of the transmission gear selection switch connector while pushing the shift lever toward the "+" mark on the A/T gear position indicator panel; then check for continuity between the No. 7 and No. 2 terminals while pulling the shift lever toward the "–" mark. Check for continuity between the No. 8 and No. 2 terminals while in the sequential sportshift mode position.



Terminal side of male terminals

Is there continuity?

YES – Go to step 9.

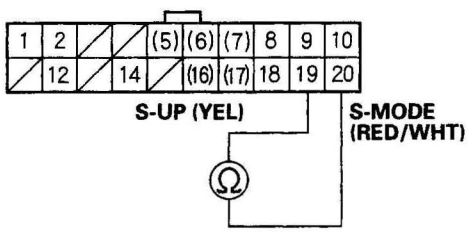
NO – Faulty the transmission gear selection switch. Replace the shift lever detent bracket assembly. ■

BACK

Protected by AR

9. Connect the transmission gear selection switch connector.
10. Disconnect PCM connector E (20P).
11. Check for continuity between PCM connector terminals E19 and E20 while pushing the shift lever toward the "+" mark.

PCM CONNECTOR E (20P)



Wire side of female terminals

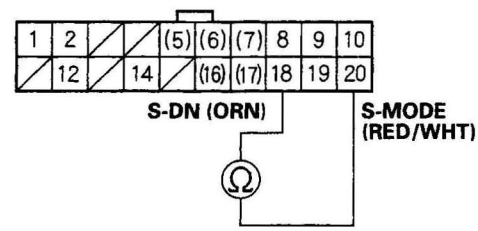
Is there continuity with the shift lever pushed toward the "+" mark, and no continuity with it released?

YES – Go to step 12.

NO – Check for an open in the wire between PCM connector terminals E19, E20 and the transmission gear selection switch connector. If the wire is OK, replace the shift lever detent bracket assembly. ■

12. Check for continuity between PCM connector terminals E18 and E20 while pulling the shift lever toward the "–" mark.

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there continuity with the shift lever pulled toward the "–" mark, and no continuity with it released?

YES – Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

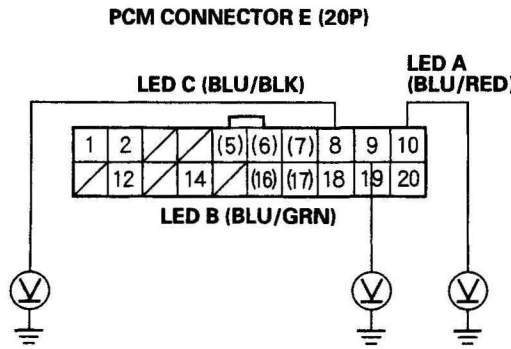
NO – Check for an open in the wire between PCM connector terminal E18 and the transmission gear selection switch connector. If the wire is OK, replace the shift lever detent bracket assembly. ■

BACK

Protected by AR

Sportshift Indicator Circuit Troubleshooting

1. Raise the front of the vehicle, and make sure it is securely supported.
2. Set the parking brake, and block both rear wheels securely.
3. Start the engine, and move the shift lever from D5 into the sequential sportshift mode position.
4. Measure the voltage between PCM connector terminals E8, E9, and E10, and body ground individually in all five sequential sportshift mode gear positions.



Wire side of female terminals

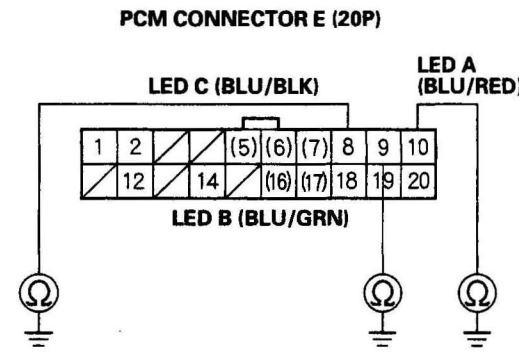
Sequential Sportshift Mode Gear Position	Terminal Voltage		
	E8 Terminal	E9 Terminal	E10 Terminal
1st	Battery voltage	0 V	0 V
2nd	0 V	Battery voltage	0 V
3rd	Battery voltage	Battery voltage	0 V
4th	0 V	0 V	Battery voltage
5th	Battery voltage	0 V	Battery voltage

Does the voltage match the table?

YES – Replace the gauge assembly. ■

NO – Go to step 5.

5. Turn the ignition switch OFF.
6. Disconnect PCM connector E (20P).
7. Disconnect the gauge assembly A (30P) connector.
8. Check for continuity between PCM connector terminals E8, E9, and E10, and body ground individually.



Wire side of female terminals

Is there continuity?

YES – Repair short to ground in the wires between PCM connector terminals E8, E9, and E10, and the gauge assembly. ■

NO – Check for loose terminal fit in PCM connectors E8, E9 and E10. If necessary, substitute a known-good PCM and recheck. ■

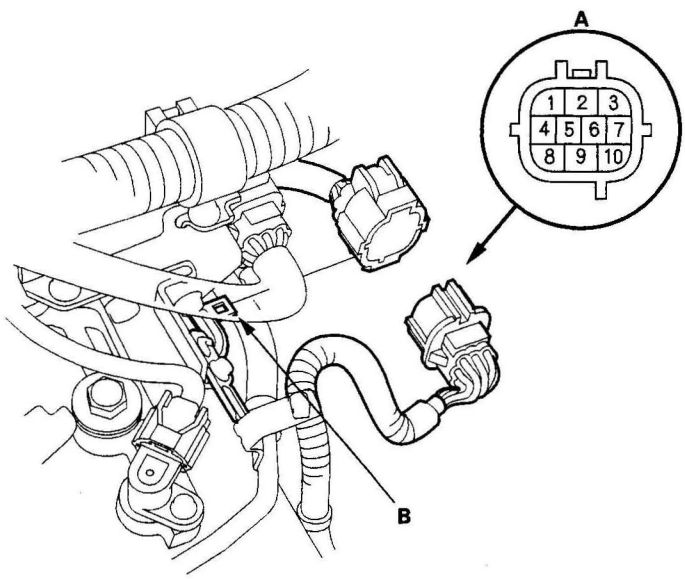
BACK

Protected by AR

Transmission Range Switch Test

1. Remove the transmission range switch connector (A) from the connector bracket (B), then disconnect the connector.
2. Check for continuity between the terminals in each switch position according to the table below.

   NOTE: Terminal No.1: Neutral position switch



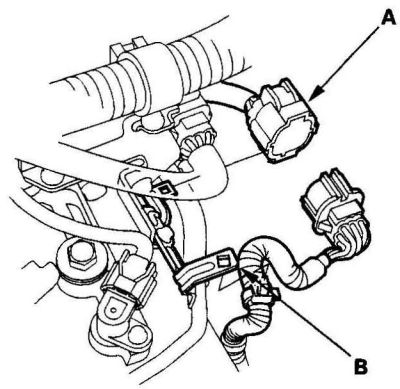
Transmission Range Switch Continuity check

Terminal / Position	1	2	3	4	5	6	7	8	9	10
P	○		○							○
R			○						○	
N	○		○					○		
D5		○	○				○			
D4		○	○			○				
D3		○	○		○					
2 & 1			○	○						

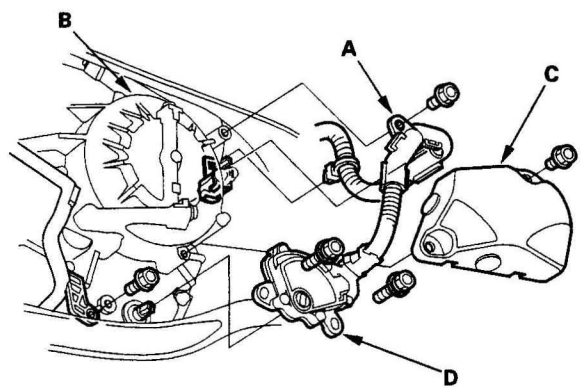
Protected by AR

Transmission Range Switch Replacement

1. Raise the front of the vehicle, and make sure it is securely supported (see page 1-14).
2. Set the parking brake, and block both rear wheels securely.
3. Shift to the N position.
4. Remove the transmission range switch connector (A) from the connector bracket (B), then disconnect the connector.

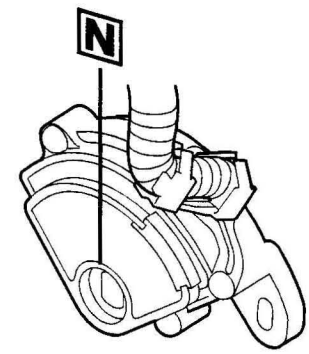


5. Remove the clamp from the harness clamp bracket on the transmission housing, and remove the harness clamp (A) from the end cover (B).

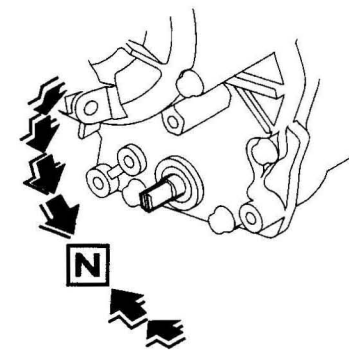


6. Remove the transmission range switch cover (C), then remove the transmission range switch (D) from the end cover.
7. Set the transmission range switch to the N position.

   NOTE: The transmission range switch clicks in the N position.



8. Set the control shaft to the N position.

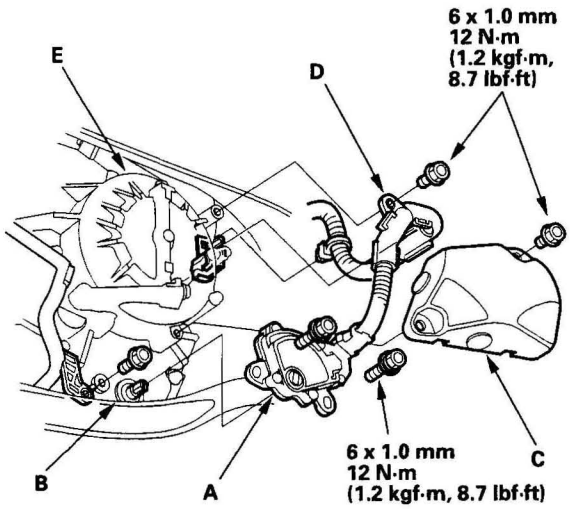


BACK

Protected by AR

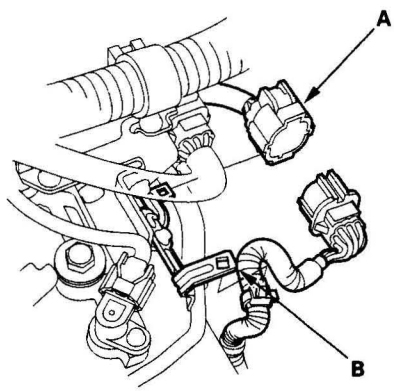
9. Install the transmission range switch (A) on the control shaft (B), then secure it with the bolts.

   NOTE: Take care not to move the transmission range switch when tightening the bolts.

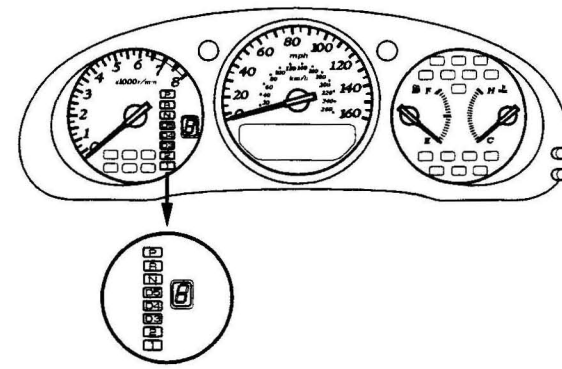


10. Install the transmission range switch cover (C), and the harness clamp (D) on the end cover (E).

11. Connect the transmission range switch connector (A), then install it on the connector bracket (B).



12. Turn the ignition switch ON (II). Move the shift lever through all gears, and check the transmission range switch synchronization with the A/T gear position indicator.



13. Start the engine. Move the shift lever through all gears, and verify the following:

    - The engine will not start in any position other than [N] or [P].
    - The back-up lights come on when the shift lever is in the [R] position.

Protected by AR

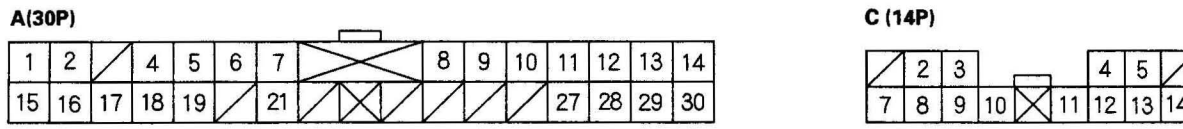
A/T Gear Position Indicator

Indicator Input Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-15).

1. Remove the gauge assembly from the dashboard (see page 22-128), then disconnect the A (30P) and C (14P) connectors from the gauge assembly.
2. Inspect the connectors and connector terminals to be sure they are making good contact.
3. If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
4. Perform the following input test at the gauge assembly A (30P) and C (14P) connectors.

GAUGE ASSEMBLY CONNECTORS



Wire side of female terminals

Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
A7	BLK/BLU	Shift lever in P	Check for continuity to ground: There should be no continuity.	• Faulty transmission range switch • An open in the wire
A8	WHT	Ignition switch ON (II) and shift lever in R	Check for voltage to ground: There should be 1 V or less. NOTE: There should be battery voltage in any other shift lever position.	
A9	RED/BLK	Ignition switch ON (II) and shift lever in N		
A10	BLU	Ignition switch ON (II) and shift lever in 2		
A11	PNK	Ignition switch ON (II) and shift lever in D3		
A12	BRN	Ignition switch ON (II) and shift lever in 1		• Faulty 1st-hold switch • An open in the wire
A27	YEL	Ignition switch ON (II) and shift lever in D4		• Faulty transmission range switch • An open in the wire
A28	GRN/BLK	Ignition switch ON (II) and shift lever in D5	Check for voltage to ground: There should be battery voltage.	• Faulty transmission range switch • Faulty PCM • An open in the wire

BACK

Protected by AR

Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
C7	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
C10	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire

5. Connect the A (30P) and C (14P) connectors to the gauge assembly, then perform the following input test.

Cavity	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
A4	BLU/BLK	Start the engine and move the shift lever to the sequential sportshift mode 1st gear position	Check for voltage to ground: There should be 5 V.	• Faulty PCM • Faulty transmission gear selection switch • Faulty shift indicator • An open in the wire
A5	BLU/GRN		Check for voltage to ground: There should be 0 V.	
A6	BLU/RED			

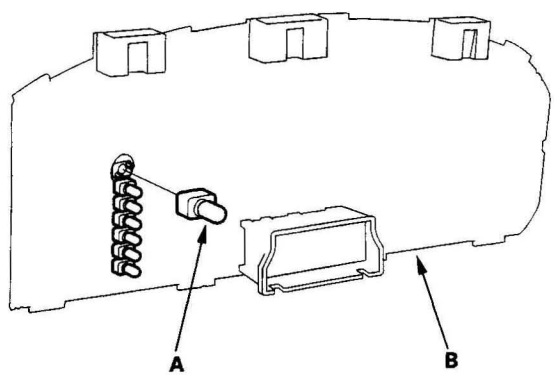
6. If all the input tests prove OK, but the indicator is faulty, replace the printed circuit board.

Protected by AR

Indicator Bulb Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-15).

1. Remove the gauge assembly (see page 22-128).
2. Disassemble the gauge assembly.
3. Replace the bulbs (A) in the gauge assembly (B).

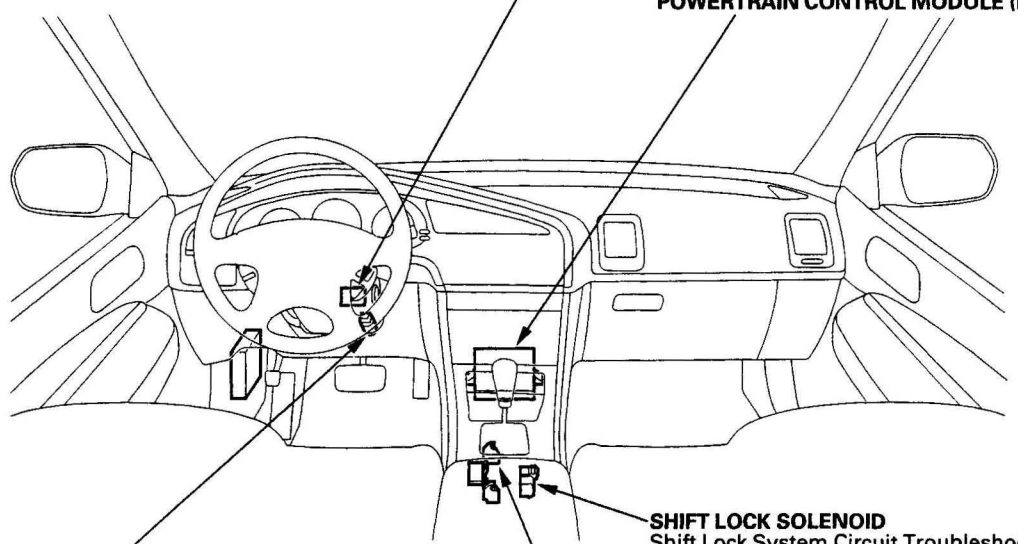


BACK

Protected by AR

A/T Interlock System

Component Location Index



STEERING LOCK ASSEMBLY
KEY INTERLOCK SOLENOID
KEY INTERLOCK SWITCH
System Circuit Troubleshooting, page 14-393
Test, page 14-397

POWERTRAIN CONTROL MODULE (PCM)

SHIFT LOCK SOLENOID
Shift Lock System Circuit Troubleshooting, page 14-391
Reverse Lock System Circuit Troubleshooting, page 14-395
Test, page 14-397
Replacement, page 14-398

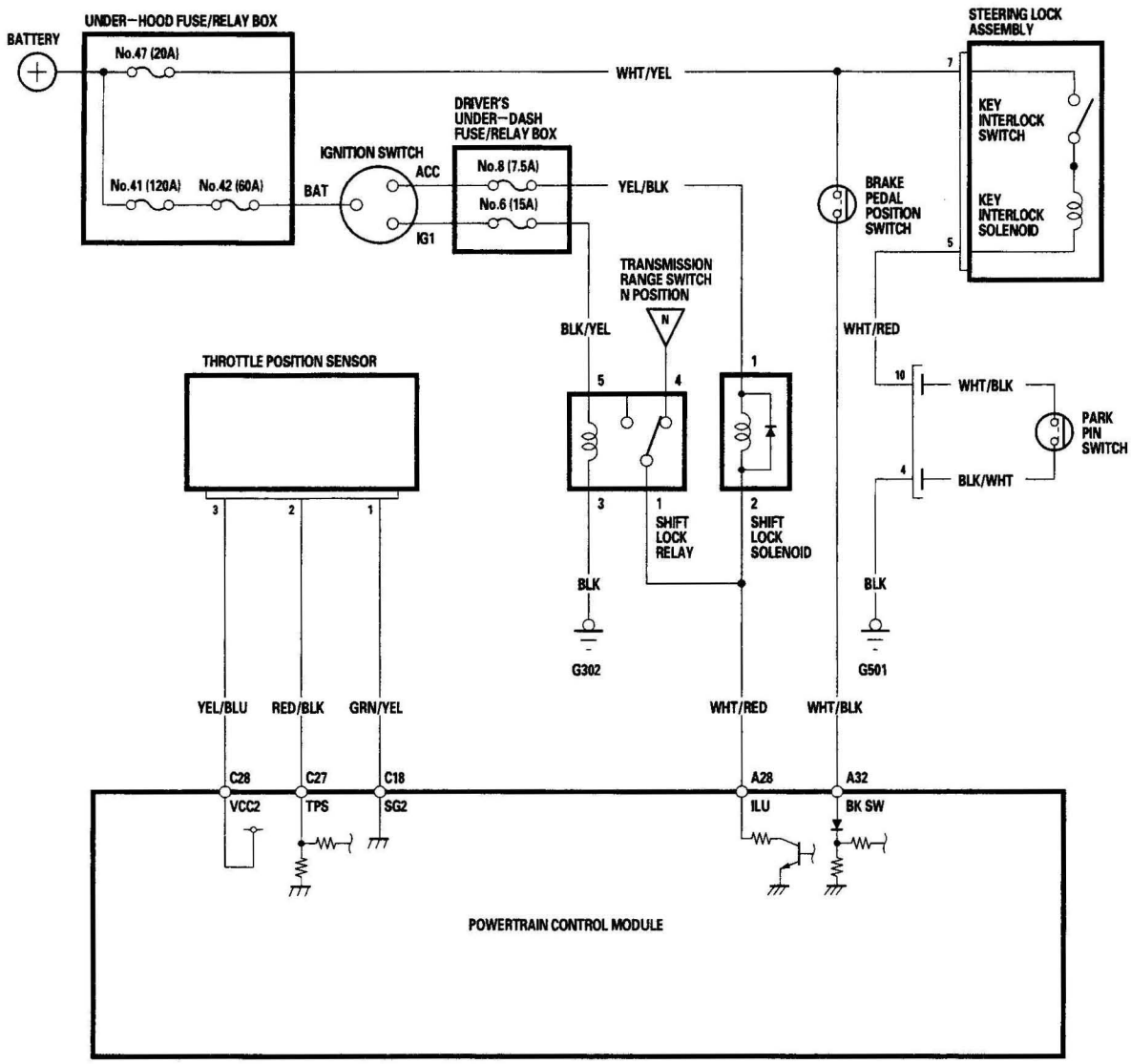
BRAKE PEDAL POSITION SWITCH

PARK PIN SWITCH
Test, page 14-398

Protected by AR

A/T Interlock System

Circuit Diagram



BACK

Protected by AR

Shift Lock System Circuit Troubleshooting

1. Press the brake pedal.

   Are the brake lights ON?

   YES – Go to step 2.

   NO – Repair faulty brake light circuit. ■

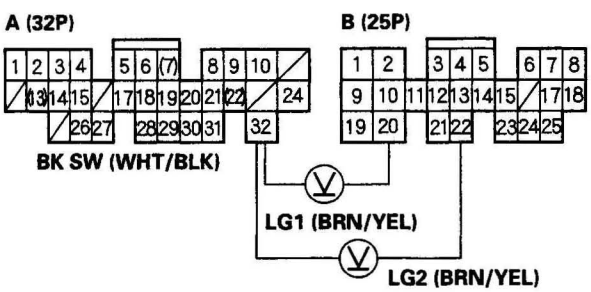
2. Turn the ignition switch ON (II), and shift to the [P] position.

3. Turn the ignition switch OFF.

4. Disconnect PCM connectors A (32P) and B (25P).

5. Press the brake pedal, and measure the voltage between PCM connector terminals A32 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES – Release the brake pedal and go to step 6.

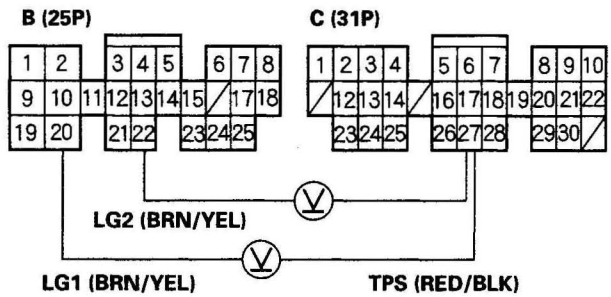
NO – Repair open in the wire between PCM connector terminal A32 and the brake pedal position switch. ■

6. Reconnect PCM connectors A (32P) and B (25P).

7. Turn the ignition switch ON (II).

8. Measure the voltage between PCM connector terminals C27 and B20 or B22.

PCM CONNECTORS



Wire side of female terminals

Is there about 0.5 V (throttle fully closed)?

YES – Go to step 13.

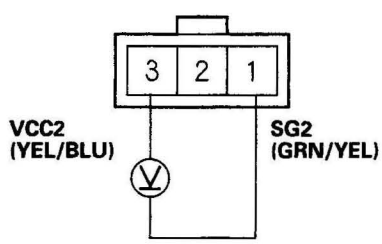
NO – Go to step 9.

9. Turn the ignition switch OFF.

10. Disconnect the throttle position sensor (TPS) connector.

11. Measure the voltage between the No. 1 and No. 3 terminal of the throttle position sensor connector.

THROTTLE POSITION SENSOR CONNECTOR



Terminal side of female terminals

Is there about 5 V?

YES – Check for a short or open in the wire between PCM connector terminal C27 and the TPS. If the wire is OK, replace the throttle body. ■

NO – Go to step 12.

(cont'd)

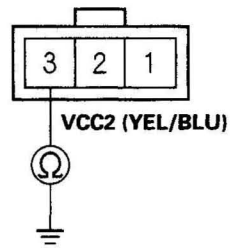
BACK

Protected by AR

Shift Lock System Circuit Troubleshooting (cont'd)

12. Turn the ignition switch OFF, and disconnect PCM connector C (31P). Check for continuity between the No. 3 terminal and body ground.

THROTTLE POSITION SENSOR CONNECTOR



Terminal side of female terminals

Is there continuity?

YES – Check for a short to ground between the No. 3 terminal of the TPS connector and ground. If the wire is OK, replace the PCM. ■

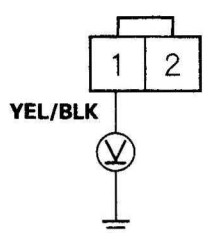
NO – Go to step 13.

13. Disconnect the shift lock solenoid connector.

14. Turn the ignition switch ON (II).

15. Measure the voltage between the No. 1 terminal of the shift lock solenoid connector and body ground.

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 16.

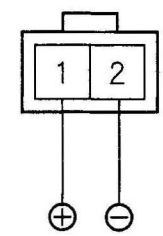
NO – Check for blown No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open or short in the wire between the No. 1 terminal of the shift lock solenoid and the driver's under-dash fuse/relay box. ■

16. Connect the No. 1 terminal of the shift lock solenoid connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal.

NOTE: Do not connect the No. 2 terminal to the battery positive terminal or you will damage the diode inside the shift lock solenoid.

17. Check that the shift lock solenoid operates.

SHIFT LOCK SOLENOID CONNECTOR



Terminal side of male terminals

Does the shift lock solenoid operate properly?

YES – Check for an open in the wire between PCM connector terminal A28 and the shift lock solenoid. ■

NO – Replace the shift lock solenoid. ■

BACK

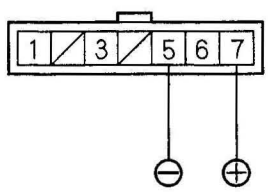
Protected by AR

Key Interlock System Circuit Troubleshooting

1. Disconnect the key switch connector (7P) from the steering lock assembly.

2. Connect the No. 7 terminal of the key switch connector to the battery positive terminal, and connect the No. 5 terminal to the battery negative terminal.

KEY SWITCH CONNECTOR (7P)



Terminal side of male terminals

3. Turn the ignition switch to ACC (I), then push the ignition key.

4. Check the key interlock solenoid operation. A clicking sound should be heard while pushing the ignition key, and you should not be able to turn it to the OFF position.

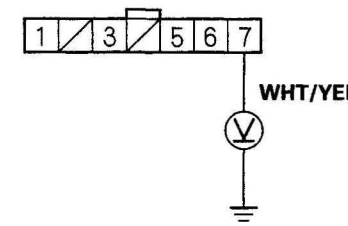
Does the key interlock solenoid operate properly?

YES – Go to step 5.

NO – Faulty key interlock solenoid/switch. Replace the ignition key cylinder/steering lock assembly.■

5. Measure the voltage between the No. 7 terminal and body ground.

KEY SWITCH CONNECTOR (7P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 6.

NO – Check for blown No. 47 (20A) fuse in the under-hood fuse/relay box. If the fuse is OK, repair open or short in the wire between the No. 7 terminal of the key switch connector and under-hood fuse/relay box.■

(cont'd)

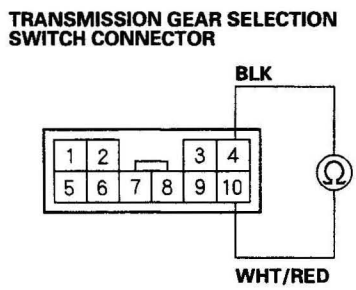
BACK

Protected by AR

Key Interlock System Circuit Troubleshooting (cont'd)

6. Disconnect the transmission gear selection switch connector on the rear of the shift lever.

7. With the shift lever in Park and pushed to the right, check for continuity between the No. 4 and No. 10 terminals of the transmission gear selection switch connector.



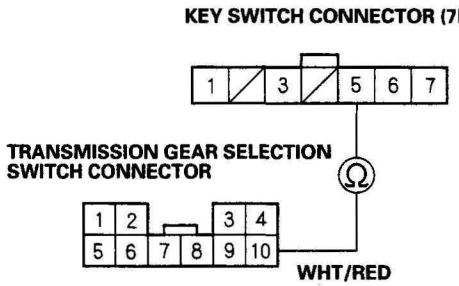
Terminal side of male terminals

Is there continuity?

YES – Go to step 8.

NO – Repair open in the wires between the park pin switch and the transmission gear selection switch connector. If the wires are OK, replace the shift lever detent bracket assembly. ■

8. Check for continuity between the No. 10 terminal of the transmission gear selection switch connector and the No. 5 terminal of the key switch connector.



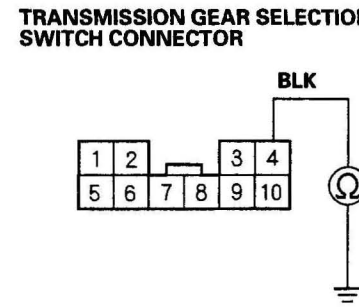
Wire side of female terminals

Is there continuity?

YES – Go to step 9.

NO – Repair open in the wire between No. 10 terminal of the transmission gear selection switch connector and the No. 5 terminal of the key switch connector. ■

9. Check for continuity between the No. 4 terminal of the transimission gear selection switch connector and body ground.



Wire side of female terminals

Is there continuity?

YES – Check for loose terminal fit in the key switch connector and transmission gear selection switch connector. If necessary, substitute a known-good steering lock assembly. ■

NO – Repair open in the wire between the No. 4 terminal of the transmission gear selection switch connector and ground (G501). Repair poor ground (G501). ■

BACK

Protected by AR

Reverse Lock System Circuit Troubleshooting

1. Check whether the OBD II scan tool indicates P1705 or P1706.

   Does the OBD II scan tool indicate either code?

   YES – Perform the troubleshooting flowchart for the indicated code(s).■

   NO – Go to step 2.

2. Turn the ignition switch OFF.
3. Shift the shift lever into the [P] position while pushing the shift lock release.
4. Turn the ignition switch ON (II).
5. Press the brake pedal, and do not press the accelerator pedal.
6. Shift the shift lever out of the [P] position to check that the shift lock solenoid operates.

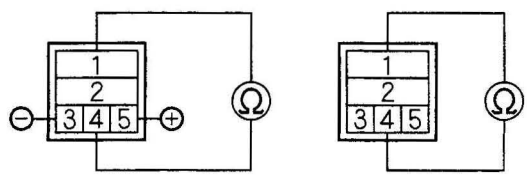
   Does the shift lever shift out of the [P] position?

   YES – Go to step 7.

   NO – Perform the troubleshooting flowchart for the Shift Lock System Circuit (see page 14-391).■

7. Turn the ignition switch OFF.
8. Remove the shift lock relay.
9. Check for continuity between the No. 1 and No. 4 terminals of the shift lock relay while connecting the battery positive terminal to the No. 5 terminal of the shift lock relay, and connecting the negative terminal to the No. 3 terminal.

SHIFT LOCK RELAY



Terminal side of male terminals

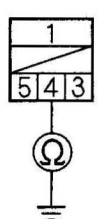
Is there no continuity when connecting the battery terminals, and continuity when disconnecting the battery terminals?

YES – Go to step 10.

NO – Replace the shift lock relay.■

10. Shift the shift lever into the [N] position.
11. Check the continuity between the No. 4 terminal of the shift lock relay socket and body ground.

SHIFT LOCK RELAY SOCKET



Terminal side of male terminals

Is there continuity?

YES – Go to step 12.

NO – Repair open in the wire between the No. 4 terminal of the shift lock relay and the transmission range switch.■

(cont'd)

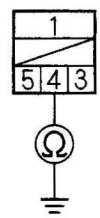
Protected by AR

Reverse Lock System Circuit Troubleshooting (cont'd)

12. Shift the shift lever out of the [N] position.

13. Check for continuity between the No. 4 terminal of the shift lock relay socket and body ground.

SHIFT LOCK SOCKET



Terminal side of female terminals

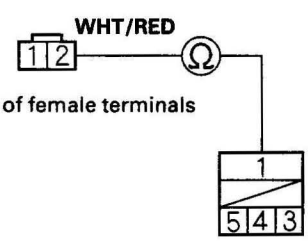
Is there continuity?

YES – Repair short to ground in the wire between the No. 4 terminal of the shift lock relay and the transmission range switch. ■

NO – Go to step 14.

14. Check for continuity between the No. 1 terminal of the shift lock relay socket and the No. 2 terminal of the shift lock solenoid connector.

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

Terminal side of female terminals

Is there continuity?

YES – Check for loose terminal fit in the connectors. Repair the reverse lock mechanism. ■

NO – Repair open in the wire between the No. 1 terminal of the shift lock relay and the shift lock solenoid connector. ■

BACK

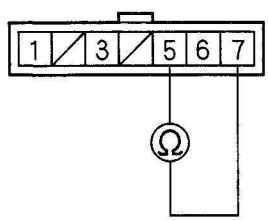
Protected by AR

Key Interlock Solenoid/Switch Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-15).

1. Remove the driver's dashboard lower cover (see page 20-65).
2. Disconnect the key switch connector (7P) from the steering lock assembly.
3. Check for continuity between the No. 5 and No. 7 terminals when the key is pushed, and check for no continuity when the key is released.

KEY SWITCH CONNECTOR (7P)

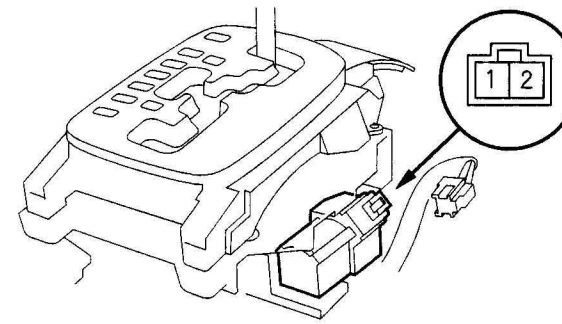


Terminal side of male terminals

4. Check that the key cannot be removed with power connected to the No. 7 terminal and ground connected to the No. 3 terminals.
   - If the key cannot be removed, the key interlock solenoid is OK.
   - If the key can be removed, replace the steering lock assembly (the key interlock solenoid is not available separately).

Shift Lock Solenoid Test

1. Remove the console panel (see page 20-63).
2. Disconnect the shift lock solenoid 2P connector.



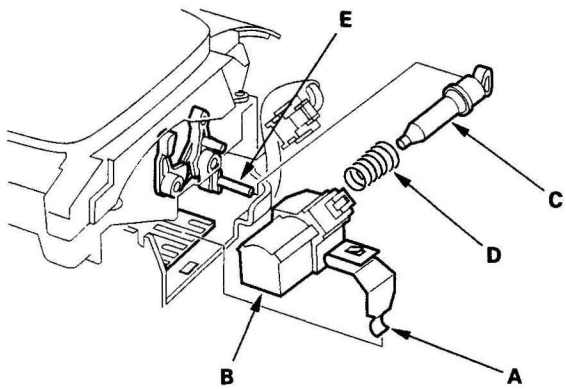
3. Connect the No. 1 terminal of the shift lock solenoid connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal.
4. Check that the shift lever can be moved from the [P] position. Release the battery terminals from the shift lock solenoid connector. Move the shift lever back to the [P] position, and make sure it locks.

   NOTE: Do not connect power to the No. 2 terminal (reverse polarity) or you will damage the diode inside the solenoid.
5. Check that the shift lock releases when the release lever is pushed, and check that it locks when the release lever is released.
6. If the solenoid does not work, replace it.

Protected by AR

Shift Lock Solenoid Replacement

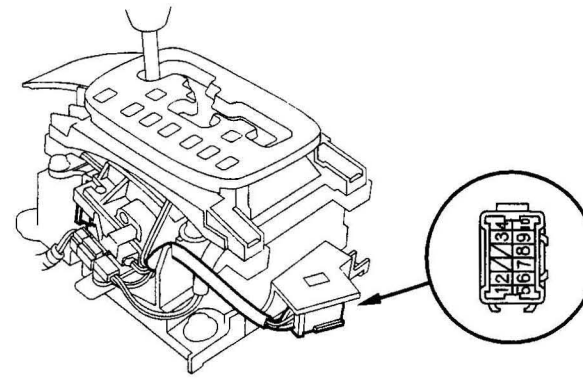
1. Remove the console panel (see page 20-63).
2. Disconnect the shift lock solenoid 2P connector.
3. Pry the shift lock solenoid clamp (A) with a screwdriver, then remove the shift lock solenoid (B).



4. Install the shift lock solenoid plunger (C) and plunger spring (D) in the new shift lock solenoid.
5. Install the shift lock solenoid by aligning the joint of the shift lock solenoid with the tip of the shift lock stop (E).
6. Secure the shift lock solenoid with the clamp, then connect the shift lock solenoid connector.

Park Pin Switch Test

1. Remove the console panel (see page 20-63).
2. Disconnect the transmission gear selection switch connector.



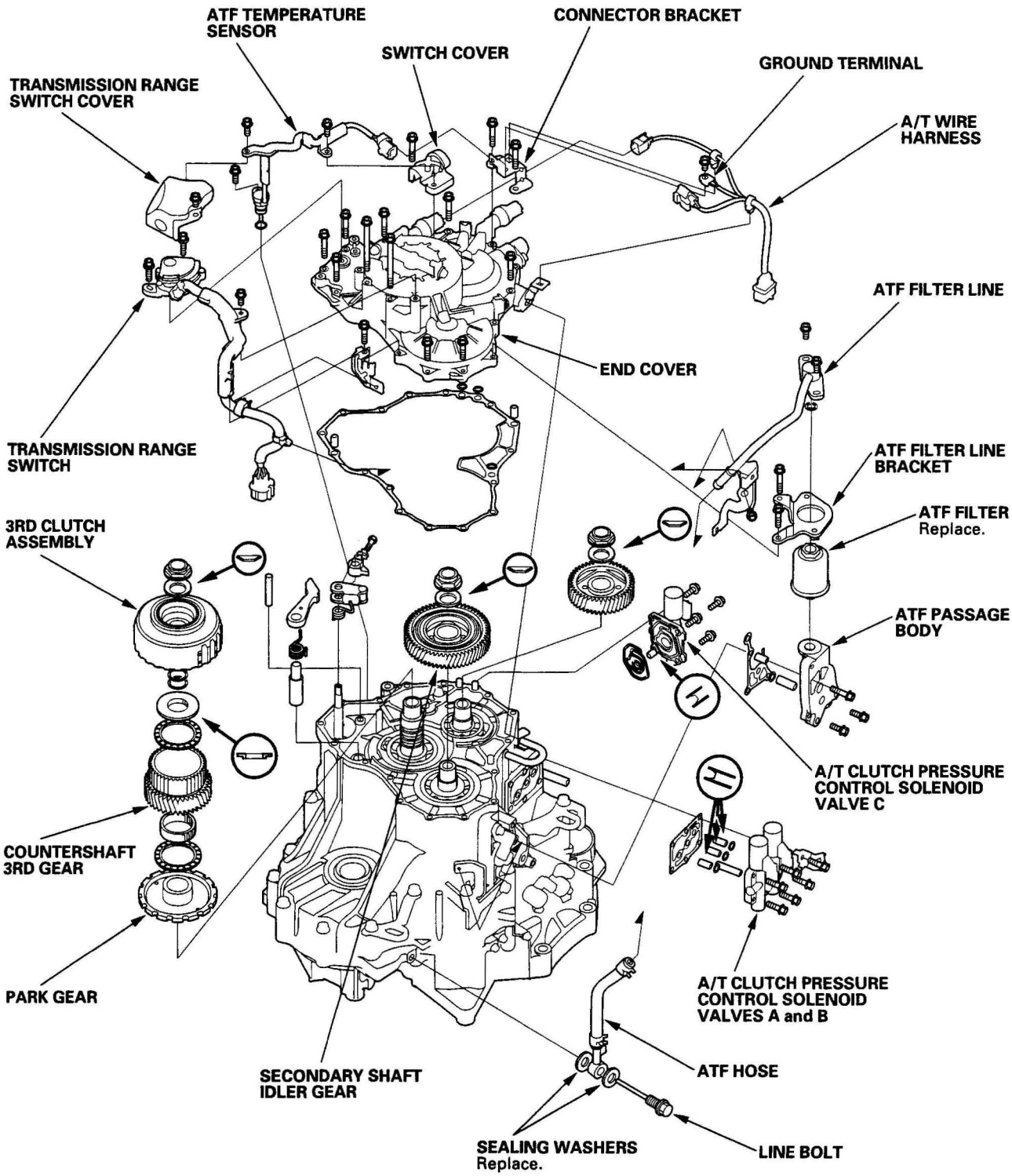
3. Shift the shift lever into the P position, then check for continuity between the No. 4 and No. 10 terminals. There should be continuity.
4. Shift the shift lever out of the P position, and check for continuity between the terminals in step 3. There should be no continuity.
5. If the park pin switch is faulty, replace the detent bracket assembly. (The park pin switch is not available separately.)

BACK

Protected by AR

End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Removal

Exploded View



(cont'd)

BACK

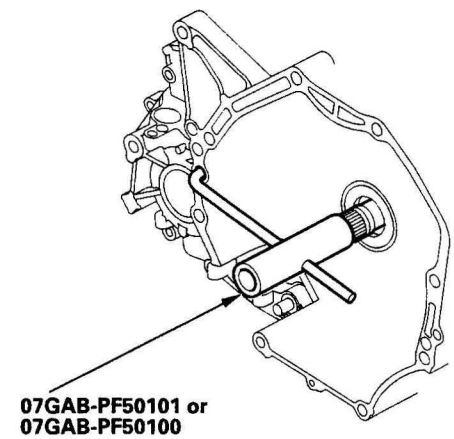
Protected by AR

End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Removal (cont'd)

Special Tools Required
- Mainshaft holder
  07GAB-PF50101 or 07GAB-PF50100
- Adjustable bearing puller, 25 – 40 mm
  07736-A01000B or 07736-A01000A

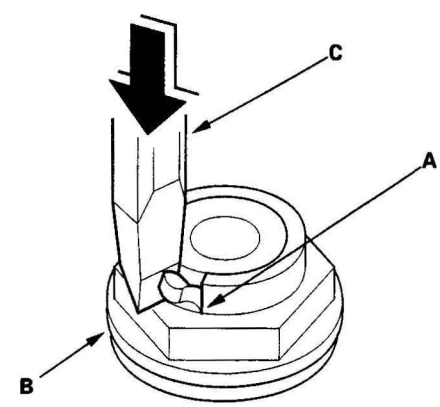
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF temperature sensor connector from the connector bracket, then disconnect the connector.
2. Remove the ATF temperature sensor harness clamp bolts and the ATF temperature sensor, then remove the switch cover.
3. Remove the A/T wire harness ground terminal from the connector bracket, and disconnect the 3rd clutch pressure switch connector, then remove the connector bracket.
4. Remove the transmission range switch cover.
5. Remove the transmission range switch harness clamp bolts and harness clamp, then remove the transmission range switch.
6. Remove the line bolt, the ATF hose, and the ATF filter line.
7. Remove the ATF filter line bracket and ATF filter. Remove the ATF passage body if necessary.
8. Remove the A/T clutch pressure control solenoid valve C.
9. Remove the remaining 11 bolts on the end cover, then remove the end cover.
10. Slip the special tool onto the mainshaft.



11. Engage the park pawl with the park gear.
12. Cut the lock tabs (A) of each shaft locknut (B) using a chisel (C). Then remove the locknuts and conical spring washers from each shaft.

    NOTE:
    - Countershaft and secondary shaft locknuts have left-hand threads.
    - Clean the old locknut; they are used to install the press fit mainshaft 3rd gear, secondary shaft idler gear, park gear, and 3rd clutch assembly on the countershaft.
    - Keep all of the chiseled particles out of the transmission.

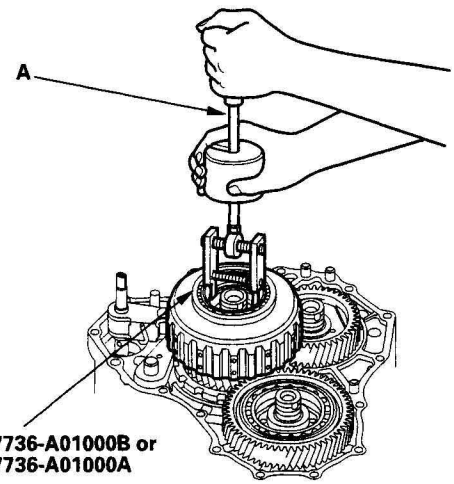


13. Remove the special tool from the mainshaft.

BACK

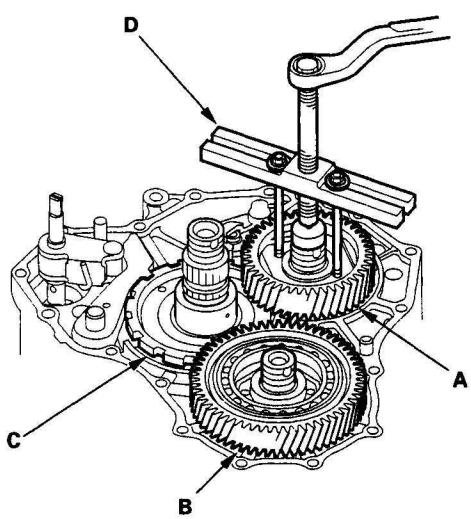
Protected by AR

14. Remove the 3rd clutch assembly using the special tool and a commercially available 3/8-16" slide hammer (A).



15. Remove the splined washer, thrust needle bearing, countershaft 1st gear, needle bearing, and thrust needle bearing from the countershaft.

16. Remove the mainshaft 3rd gear (A), secondary shaft idler gear (B), and park gear (C) with a puller (D).



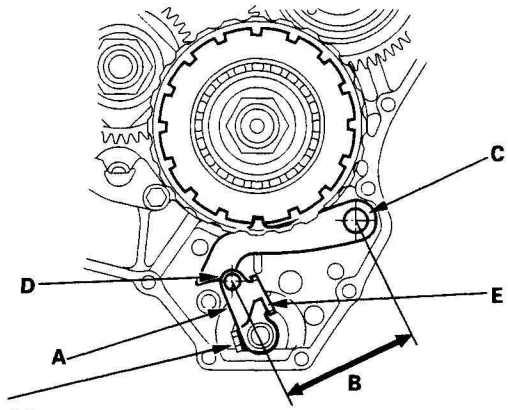
17. Remove the park pawl, park pawl spring, park pawl shaft, and stop shaft.

18. Remove the park lever from the control shaft.

19. Remove the A/T clutch pressure control solenoid valves A and B.

Park Lever Stop Inspection and Adjustment

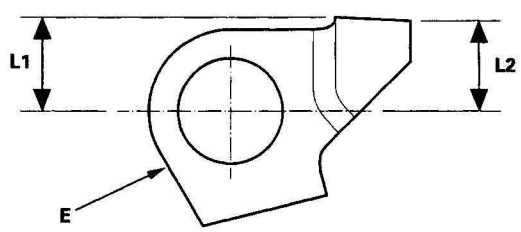
1. Set the park lever (A) in the [P] position.



2. Measure the distance (B) between the park pawl shaft (C) and the park lever roller pin (D).

STANDARD: 84.6–85.6 mm (3.33–3.37 in.)

3. If the measurement is out of tolerance, select and install the appropriate park lever stop (E) from the table below.



PARK LEVER STOP

Mark	Part Number	L1	L2
1	24537-PA9-003	11.00 mm (0.433 in.)	11.00 mm (0.433 in.)
2	24538-PA9-003	10.80 mm (0.425 in.)	10.65 mm (0.419 in.)
3	24539-PA9-003	10.60 mm (0.417 in.)	10.30 mm (0.406 in.)

4. After replacing the park lever stop, make sure the distance is within tolerance.

BACK

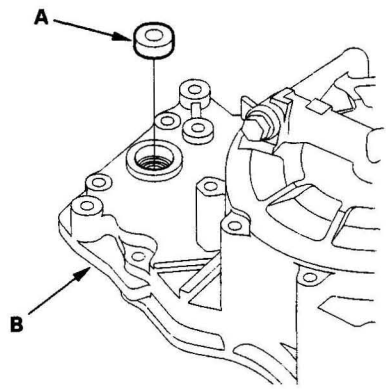
Protected by AR

Transmission End Cover

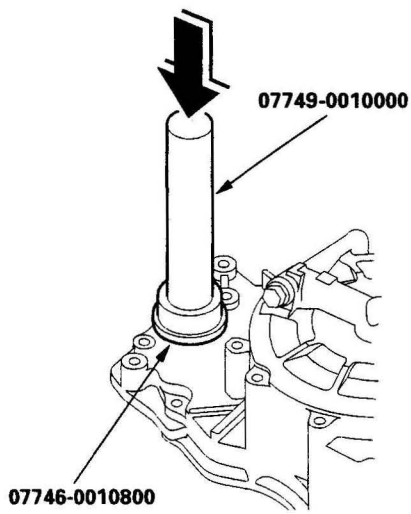
Control Shaft Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal (A) from the end cover (B).



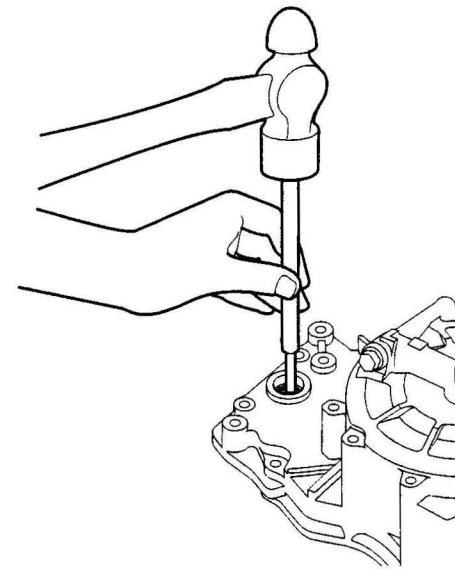
2. Install the new oil seal flush to the end cover with the special tools.



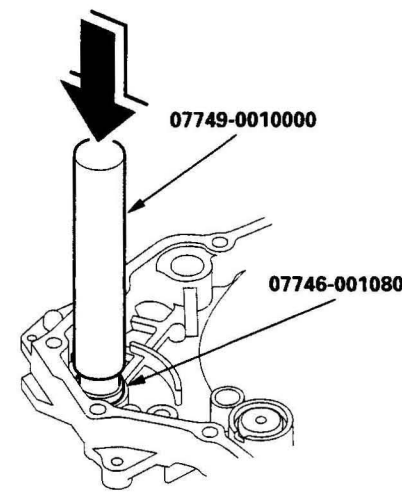
Control Shaft Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal from the end cover, then remove the bearing.



2. Install the new bearing flush to the end cover with the special tools.



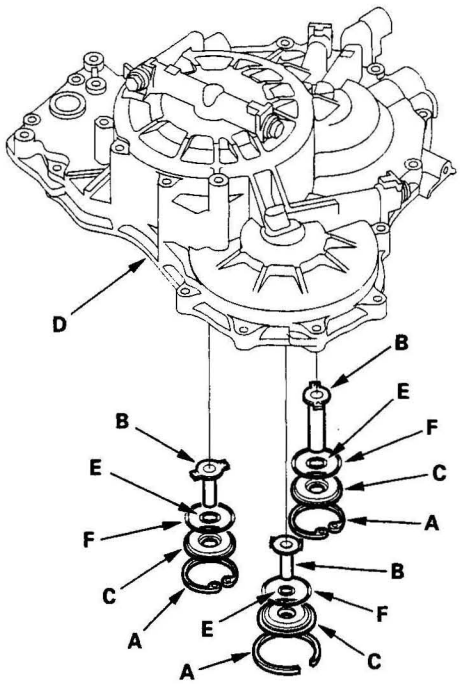
3. Install the new oil seal.

BACK

Protected by AR

ATF Feed Pipes Replacement

1. Remove the snap rings (A), ATF feed pipes (B) and feed pipe flanges (C) from the end cover (D).



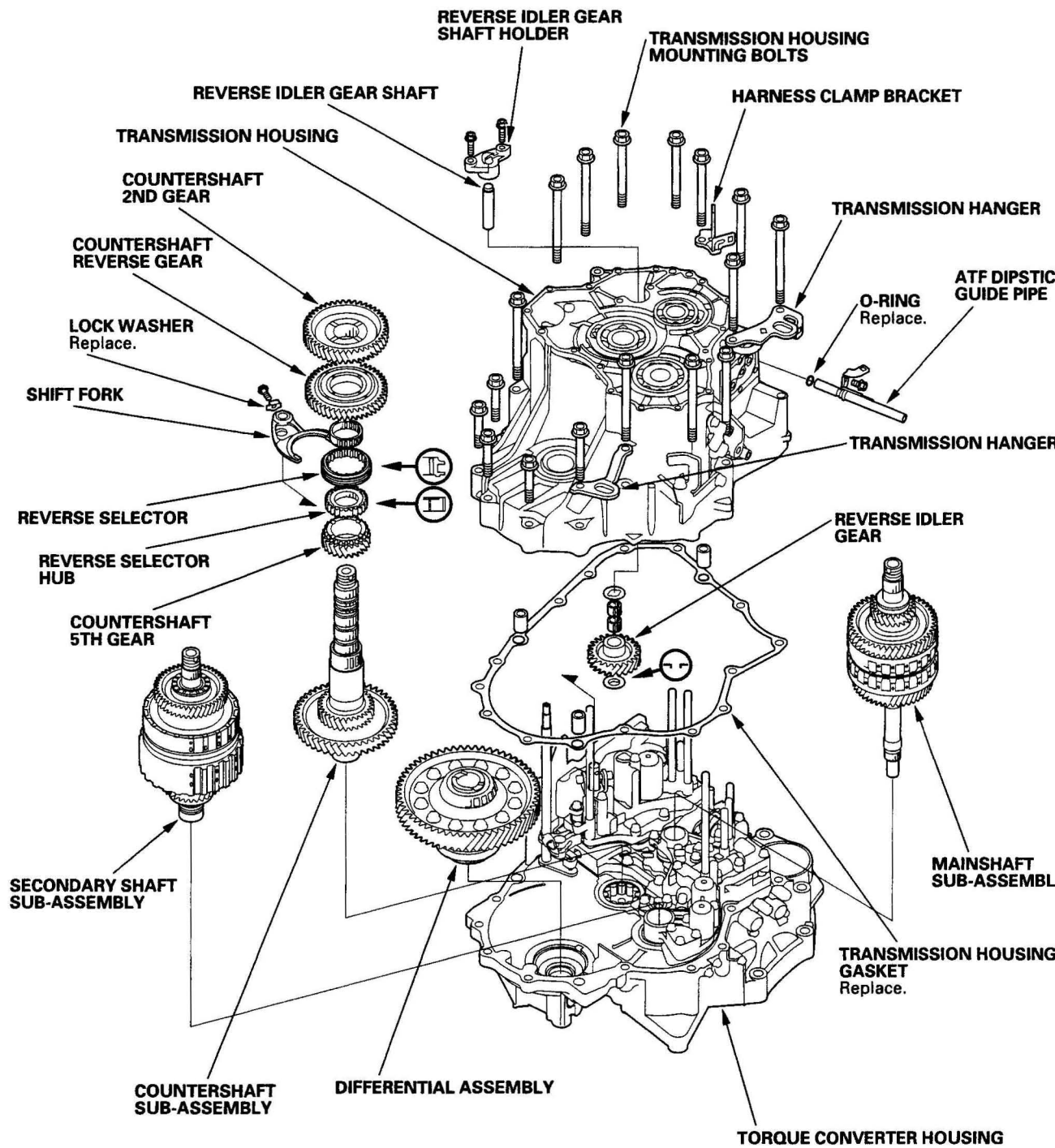
2. Install the new O-ring (E) over the ATF feed pipe.
3. Install ATF feed pipe in the end cover with aligning the feed pipe tabs with the indentations in the end cover.
4. Install the new O-ring (F) in the end cover, then install the feed pipe flange over the ATF feed pipe and O-rings.
5. Secure the ATF feed pipe and feed pipe flange with the snap ring.

BACK

Protected by AR

Housing and Shaft Assemblies Removal

Exploded View



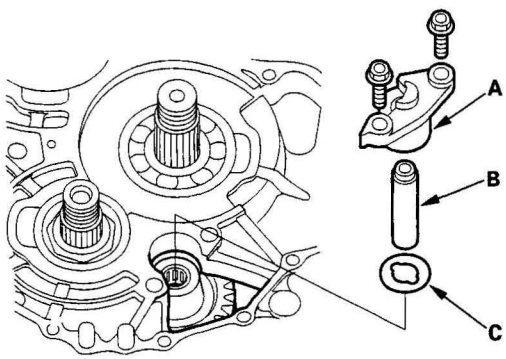
BACK

Protected by AR

Special Tools Required
Housing puller 07HAC-PK40102

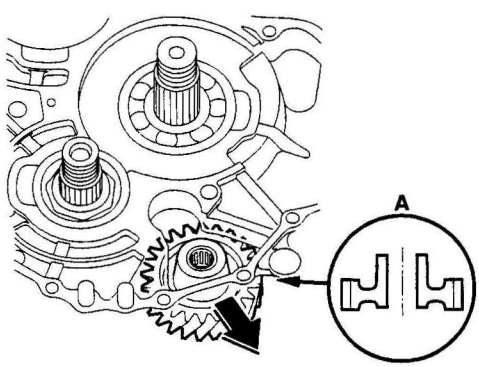
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF dipstick guide pipe.
2. Remove the two bolts securing the reverse idler gear shaft holder, then remove the reverse idler gear shaft holder (A), shaft (B), and washer (C).

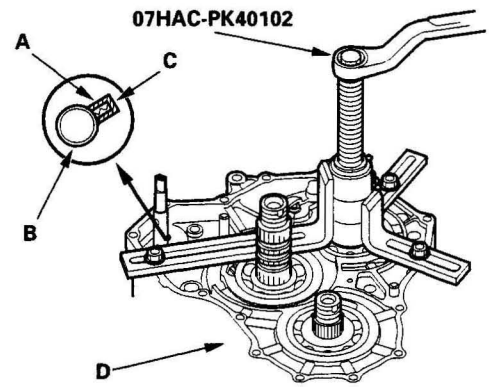


3. Remove the transmission housing mounting bolts, transmission hangers, and harness clamp bracket.
4. Move the reverse idler gear (A) to disengage it from the mainshaft and countershaft reverse gears.

   NOTE: The transmission housing will not separate from the torque converter housing if the reverse idler gear is not moved.



5. Align the spring pin (A) on the control shaft (B) with the transmission housing groove (C) by turning the control shaft.



6. Install the special tool over the mainshaft, then remove the transmission housing (D).

   NOTE: If the top arm of your housing puller is too short, replace it with Housing Puller Arm, 205 mm 07SAC-P0Z0101.

7. Remove the reverse idler gear, needle bearings, and thrust washer from the transmission housing.
8. Remove the countershaft 2nd gear, then remove the countershaft reverse gear and the needle bearing.
9. Remove the lock bolt securing the shift fork, then remove the shift fork with the reverse selector. If the reverse selector hub is not press-fitted, remove the reverse selector hub, countershaft 5th gear, and needle bearing from the countershaft.
10. Remove the secondary shaft subassembly. If the reverse selector hub is press-fitted, remove the secondary shaft subassembly, countershaft subassembly and mainshaft subassembly together.
11. Remove the countershaft subassembly.
12. Remove the mainshaft subassembly.
13. Remove the differential assembly.

Protected by AR

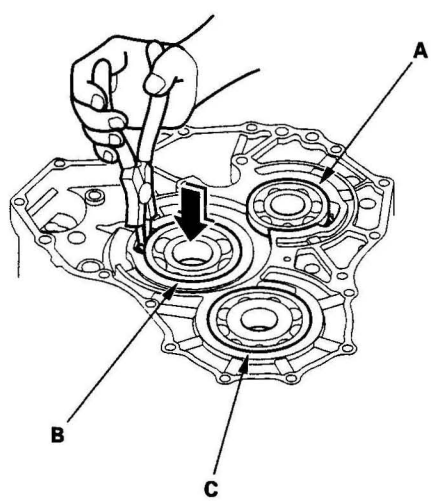
Bearing Removal and Installation

Special Tools Required
- Driver 07749-0010000
- Seal driver attachment 07GAD-PG40101 or 07GAD-PG40100
- Attachment, 62 x 68 mm 07746-0010500
- Attachment, 72 x 75 mm 07746-0010600

NOTE: Coat all parts with ATF before assembly.

1. To remove the mainshaft bearing (A), countershaft bearing (B), and secondary shaft bearing (C) from the transmission housing, expand each snap ring with the snap ring pliers, then push the bearing out.

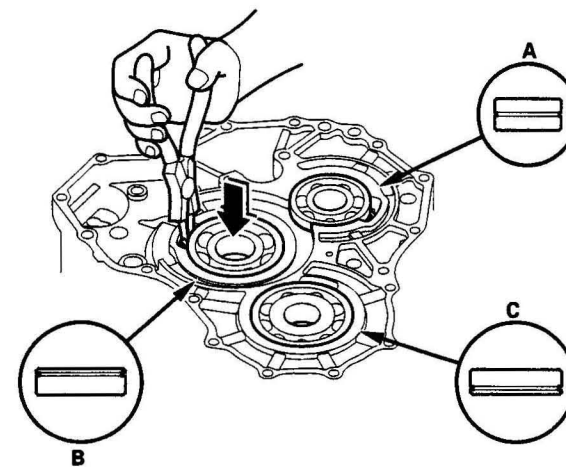
   NOTE: Do not remove the snap rings unless it's necessary to clean the grooves in the housing.



2. Install the bearings in the direction shown.

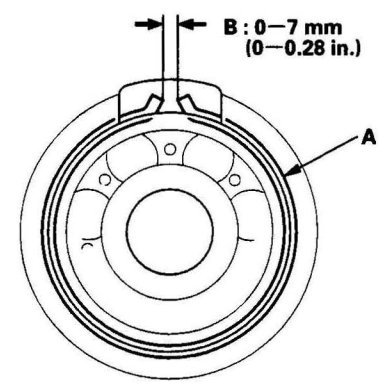
3. Expand each snap ring with the snap ring pliers, and insert the bearing part-way into the housing.

4. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.



5. After installing the bearings verify the following:

   - The snap rings (A) are seated in the bearing and housing grooves.
   - The ring end gaps (B) are correct.

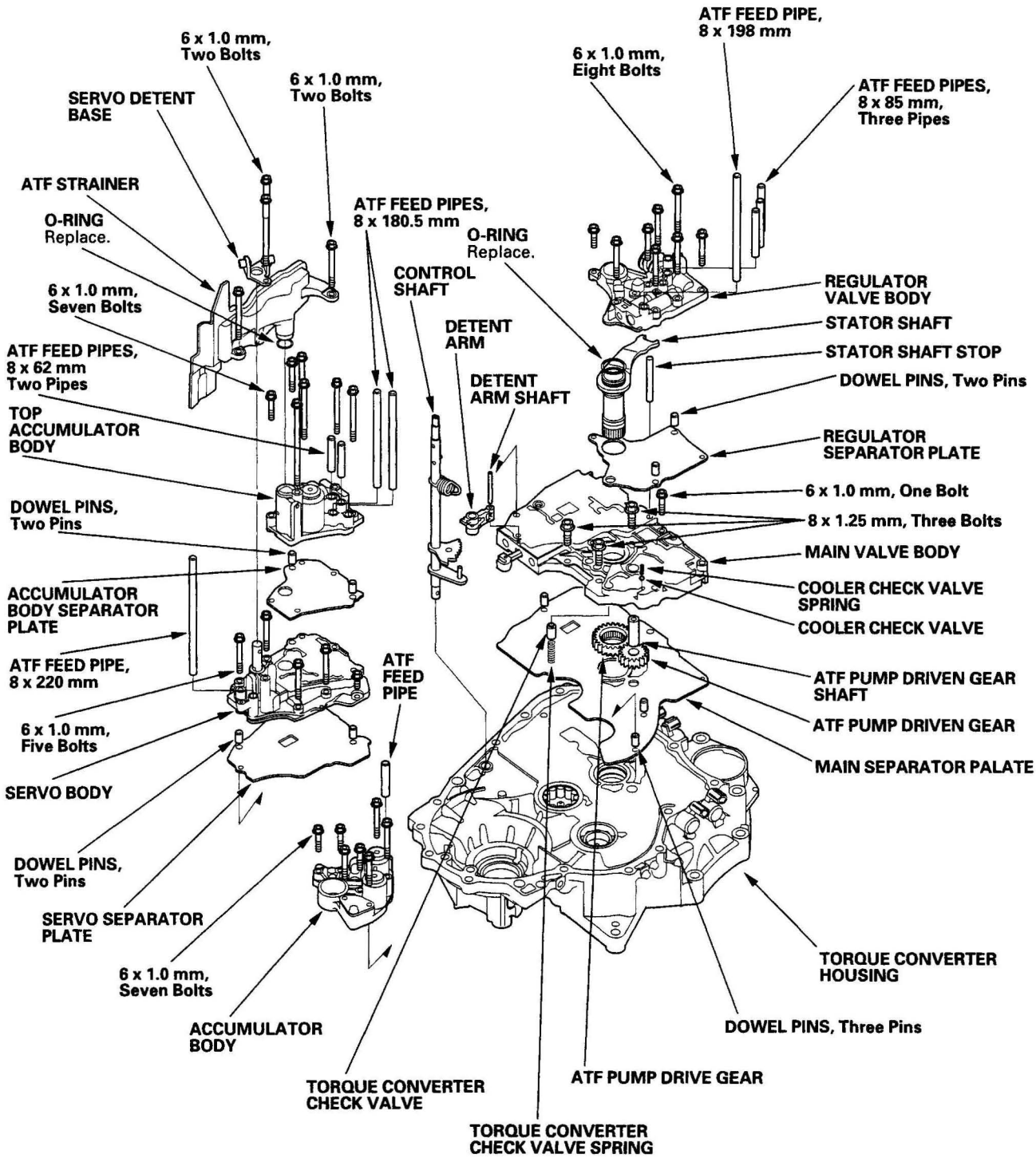


BACK

Protected by AR

Valve Bodies and ATF Strainer Removal

Exploded View



(cont'd)

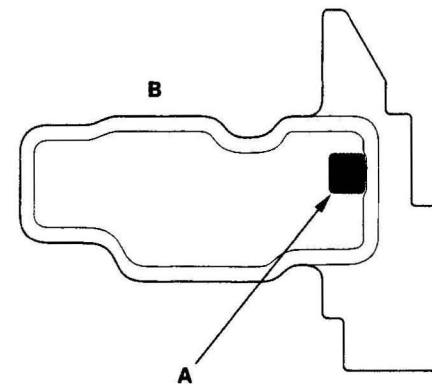
BACK

Protected by AR

Valve Bodies and ATF Strainer Removal (cont'd)

NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF feed pipes from the regulator valve body, servo body, top accumulator body, and accumulator body.
2. Remove the servo detent base (two bolts).
3. Remove the ATF strainer (two bolts).
4. Remove the top accumulator body (seven bolts), then remove the accumulator body separator plate and dowel pins (two).
5. Remove the servo body (five bolts), then remove servo separator plate and dowel pins (two).
6. Remove the regulator valve body (eight bolts).
7. Remove the stator shaft and stator shaft stop.
8. Remove the regulator separator plate and dowel pins (two).
9. Unhook the detent spring from the detent arm, then remove the detent arm shaft, detent arm, and control shaft.
10. Remove the cooler check valve spring and cooler check valve (ball).
11. Remove the main valve body (four bolts).
12. Remove the torque converter check valve and spring.
13. Remove the ATF pump driven gear shaft, then remove the ATF pump gears.
14. Remove the accumulator body (seven bolts).
15. Remove the main separator plate and dowel pins (three).
16. Clean the inlet opening (A) of the ATF strainer (B) thoroughly with compressed air, then check that it is in good condition and that the inlet opening is not clogged.



17. Test the ATF strainer by pouring clean ATF through the inlet opening, and replace it if it is clogged or damaged.

BACK

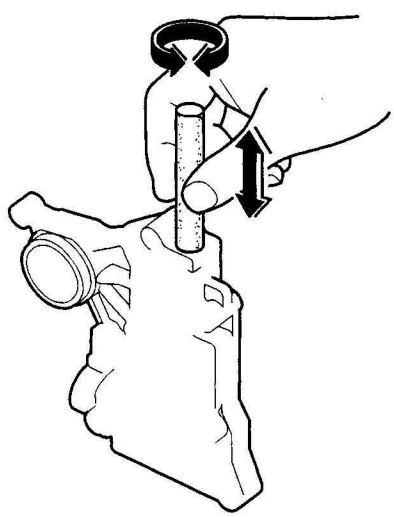
Protected by AR

Valve Body Repair

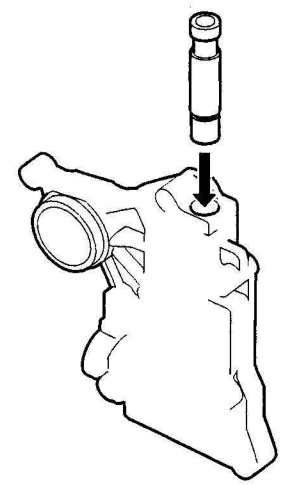
NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. Use this procedure to free the valves.

1. Soak a sheet of # 600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore. It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.
3. Inspect the valve for any scuff marks. Use the ATF-soaked # 600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked # 600 paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

   NOTE: The valve body is aluminum and doesn't require much polishing to remove any burrs.



5. Remove the # 600 paper. Thoroughly wash the entire valve body in solvent, then dry it with compressed air.
6. Coat the valve with ATF, then drop it into its bore. It should drop to the bottom of the bore under its own weight. If not, repeat step 4 and 5, then retest. If the valve still sticks, replace the valve body.



7. Remove the valve, and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

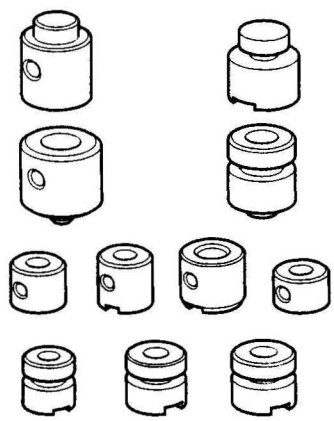
BACK

Protected by AR

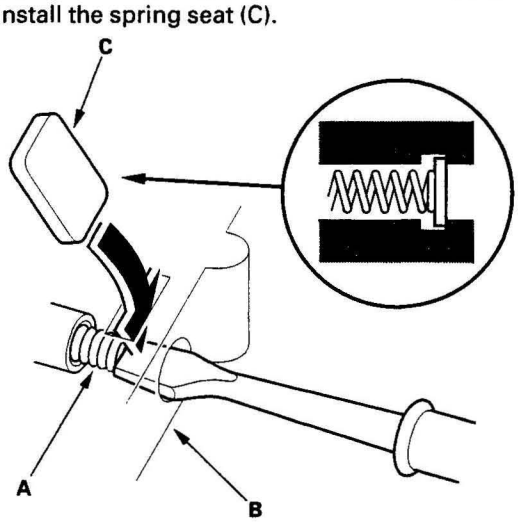
Valve Body Valve Installation

1. Coat all parts with ATF before assembly.

2. Install the valves and springs in the sequence shown for the main valve body (see page 14-411), regulator valve body (see page 14-414), servo body (see page 14-415), and top accumulator body (see page 14-416). Refer to the following valve cap illustrations, and install each valve cap so the end shown facing up will be facing the outside of the valve body.



3. Install all the springs and seats. Insert the spring (A) in the valve, then install the valve in the valve body (B). Push the spring in with a screwdriver, then install the spring seat (C).

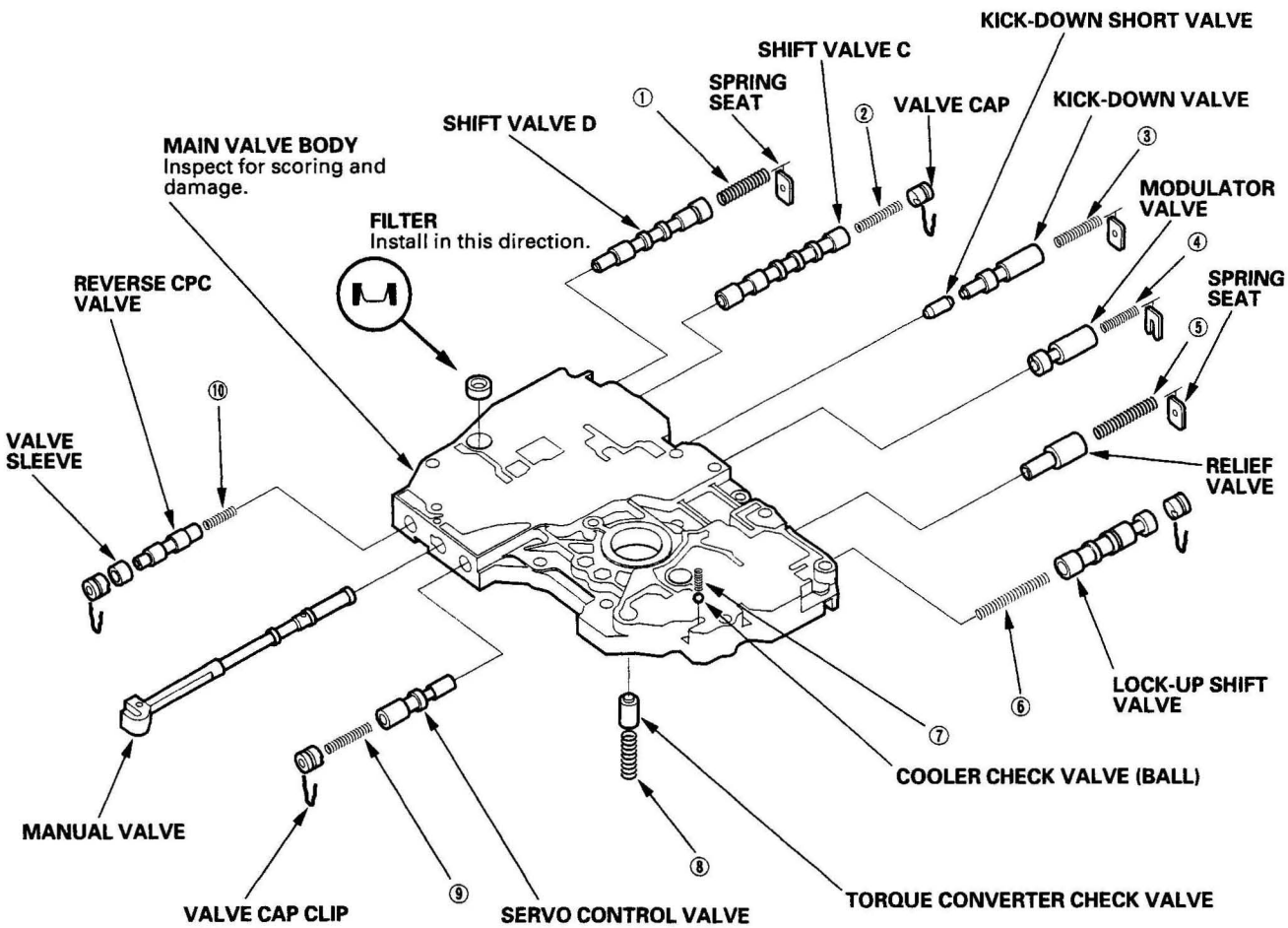


BACK

Protected by AR

Main Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Do not use a magnet to remove the check ball, it may magnetize the ball.
3. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-409).
4. Replace the valve body as an assembly if any parts worn or damaged.
5. Coat all parts with ATF during assembly.
6. Install the filter in the direction shown.



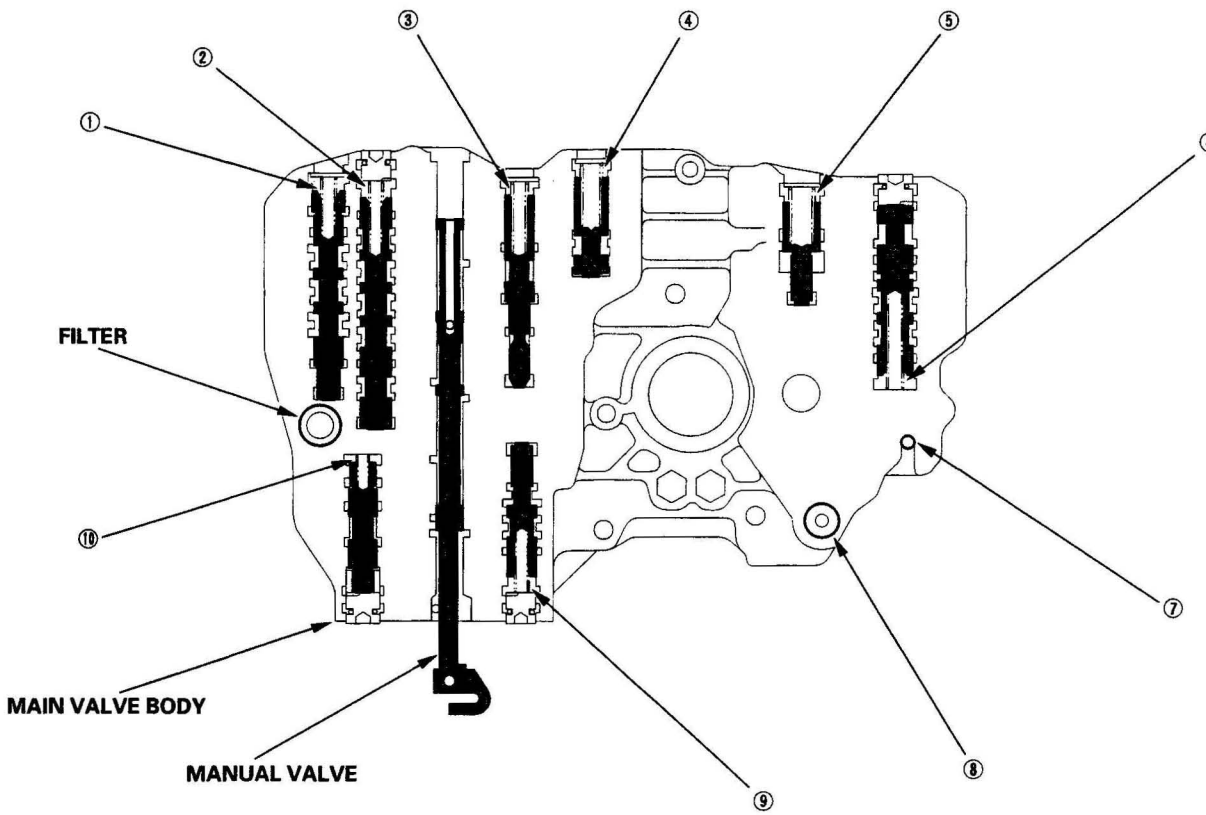
(cont'd)

BACK

Protected by AR

Main Valve Body Disassembly, Inspection, and Reassembly (cont'd)

Sectional View



SPRING SPECIFICATIONS

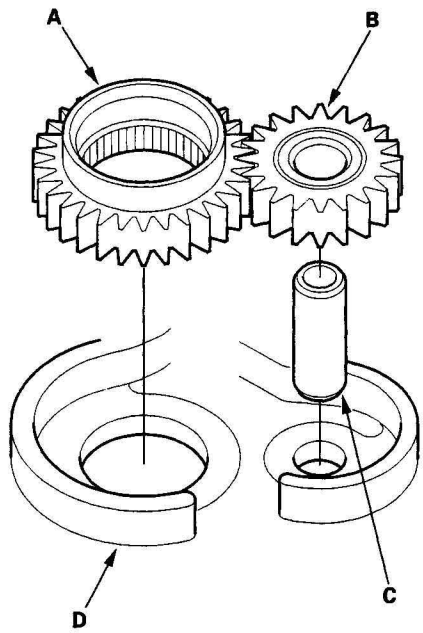
No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Shift valve D spring	0.7 (0.028)	6.6 (0.260)	33.7 (1.327)	11.6
②	Shift valve C spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
③	Kick-down valve spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
④	Modulator valve spring	1.6 (0.063)	10.4 (0.409)	33.5 (1.319)	9.8
⑤	Relief valve spring	1.2 (0.047)	11.1 (0.437)	39.0 (1.535)	9.9
⑥	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	63.0 (2.480)	22.4
⑦	Cooler check valve spring	0.6 (0.024)	5.8 (0.228)	14.5 (0.571)	6.8
⑧	Torque converter check valve spring	1.2 (0.047)	8.6 (0.339)	34.4 (1.354)	11.7
⑨	Servo control valve spring	0.9 (0.035)	6.4 (0.252)	32.5 (1.280)	17.5
⑩	Reverse CPC valve spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9

BACK

Protected by AR

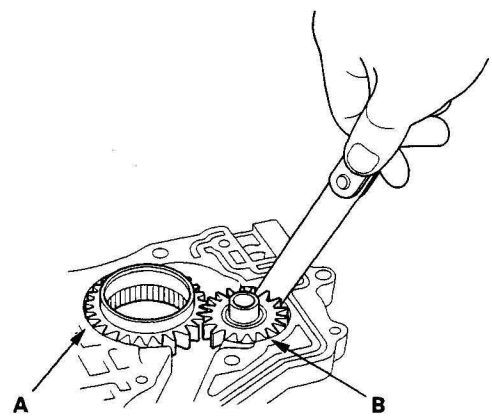
ATF Pump Inspection

1. Install the ATF pump drive gear (A), driven gear (B), and ATF pump driven gear shaft (C) in the main valve body (D). Lubricate all parts with ATF, and install the ATF pump driven gear with its grooved and chamfered side facing up.



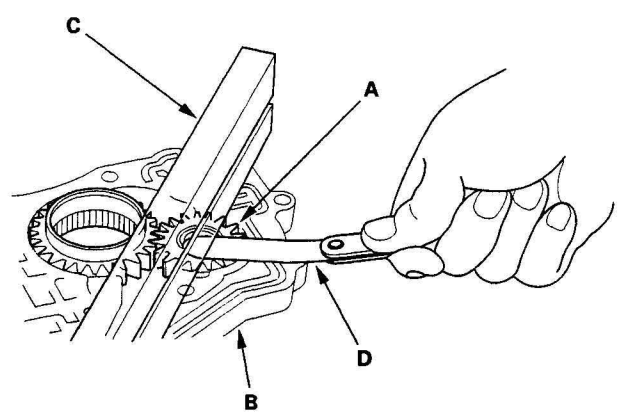
2. Measure the side clearance of the ATF pump drive gear (A) and driven gear (B).

ATF Pump Gears Side (Radial) Clearance:
Standard (New):
ATF Pump Drive Gear
0.210—0.265 mm (0.0083—0.00104 in.)
ATF Pump Driven Gear
0.070—0.125 mm (0.0028—0.0050 in.)



3. Remove the ATF pump driven gear shaft. Measure the thrust clearance between the ATF pump driven gear (A) and the valve body (B) with a straight edge (C) and a feeler gauge (D).

ATF Pump Drive/Driven Gear Thrust (Axial) Clearance:
Standard (New): 0.03—0.05 mm (0.001—0.002 in.)
Service Limit: 0.07 mm (0.003 in.)

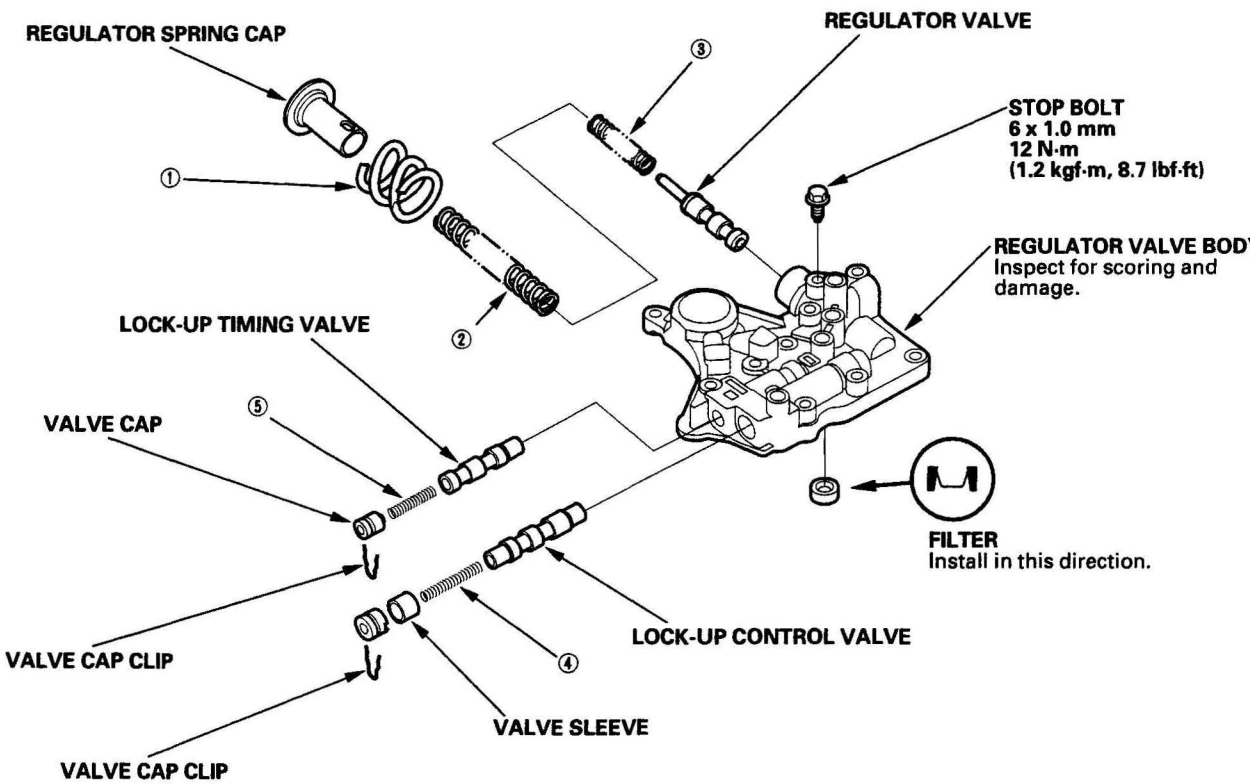


BACK

Protected by AR

Regulator Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-409).
3. Replace the valve body as an assembly if any parts are worn or damaged.
4. Hold the regulator spring cap in place while removing the stop bolt. The regulator spring cap is spring loaded. Once the stop bolt is removed, release the spring cap slowly so it does not pop out.
5. Reassembly is the reverse of the disassembly. Install the filter in the direction shown.
6. Coat all parts with ATF during assembly.
7. Align the hole in the regulator spring cap with the hole in the valve body, then press the spring cap into the valve body, and tighten the stop bolt.



SPRING SPECIFICATIONS

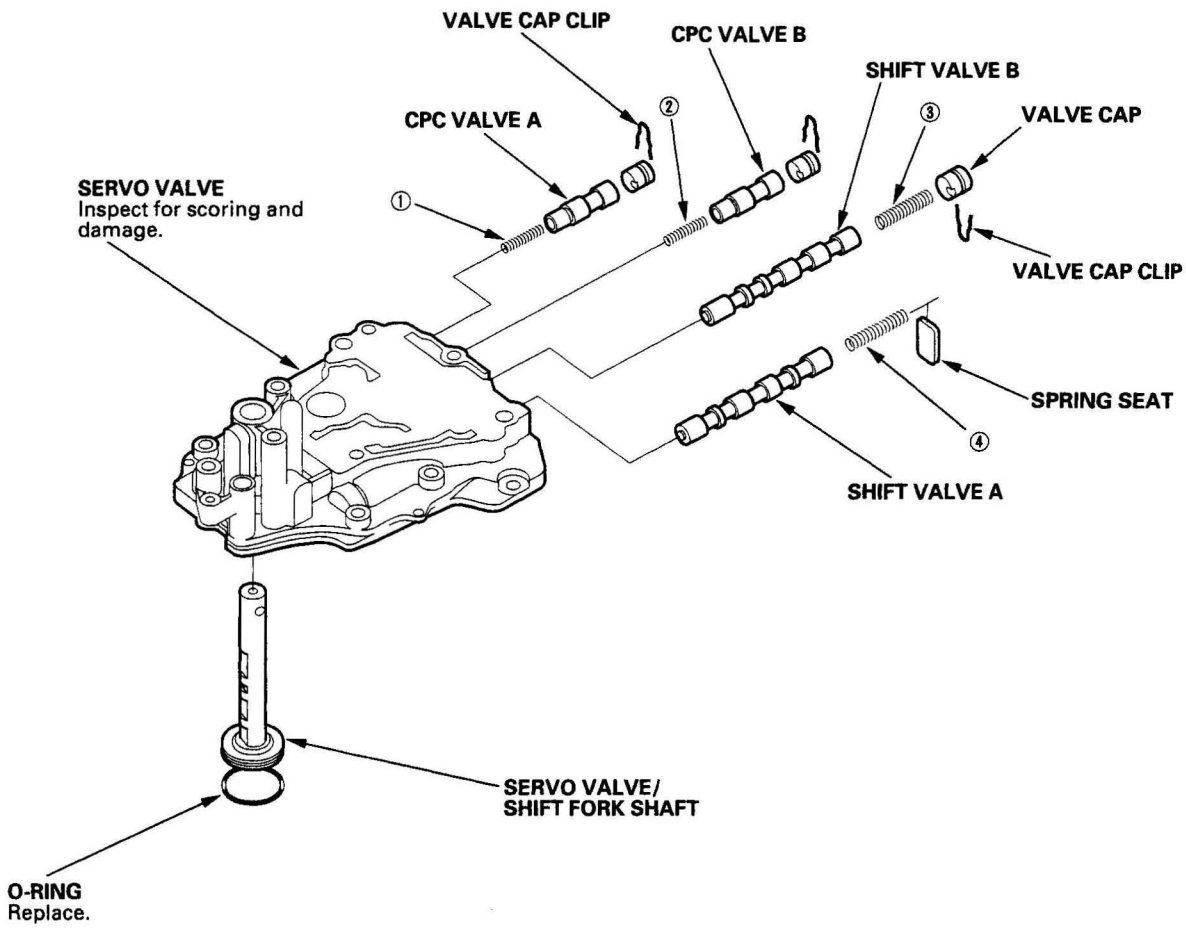
No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Stator reaction spring	5.5 (0.217)	37.4 (1.472)	30.3 (1.193)	2.1
②	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	80.6 (3.173)	16.1
③	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
④	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	42.9 (1.689)	14.2
⑤	Lock-up timing valve spring	0.65 (0.026)	6.6 (0.260)	34.8 (1.370)	15.6

BACK

Protected by AR

Servo Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-409).
3. Replace the valve body as an assembly if any parts worn or damaged.
4. Coat all parts with ATF during reassembly.



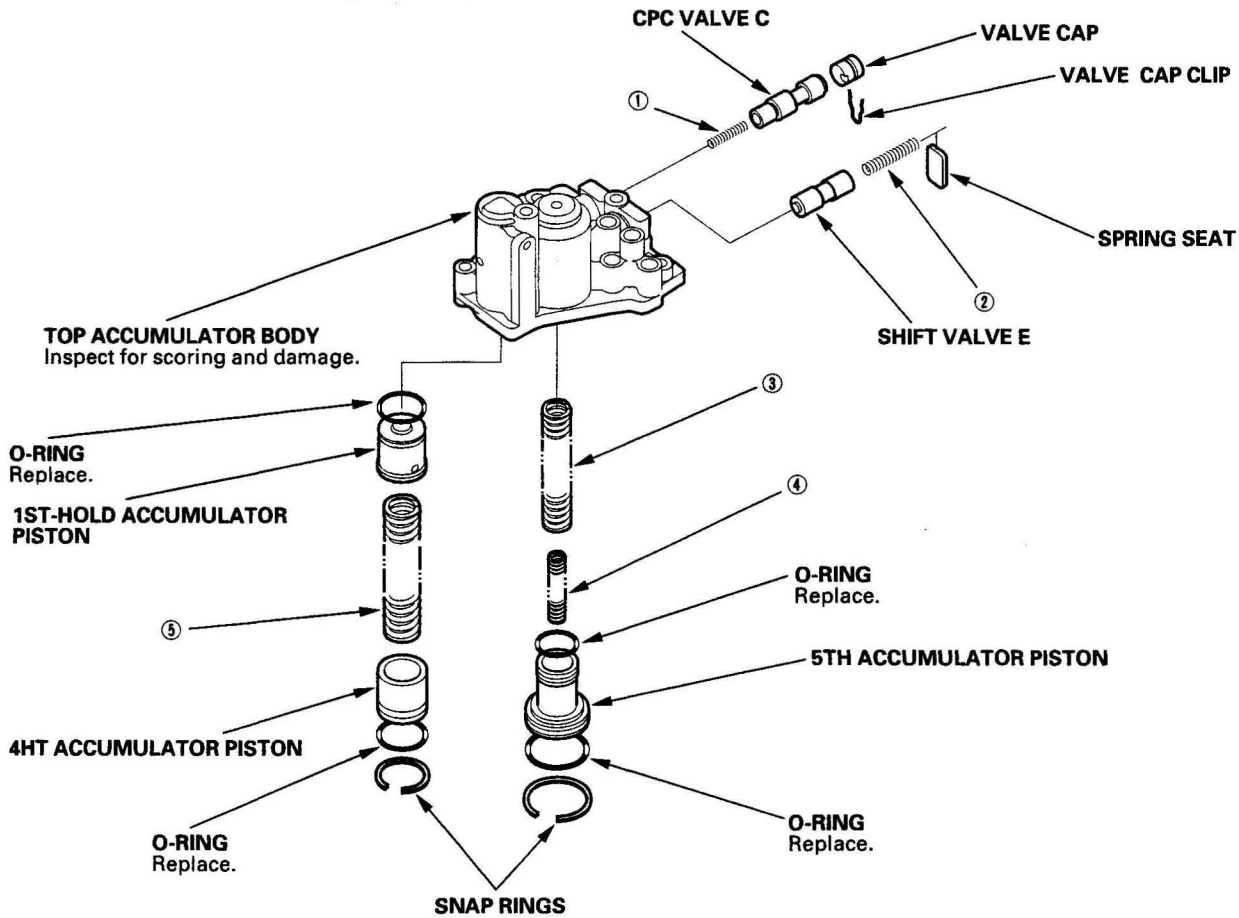
SPRING SPECIFICATIONS

No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
②	CPC valve B spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
③	Shift valve B spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
④	Shift valve A spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7

Protected by AR

Top Accumulator Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-409).
3. Replace the valve body as an assembly if any parts worn or damaged.
4. Coat all parts with ATF during assembly.



SPRING SPECIFICATIONS

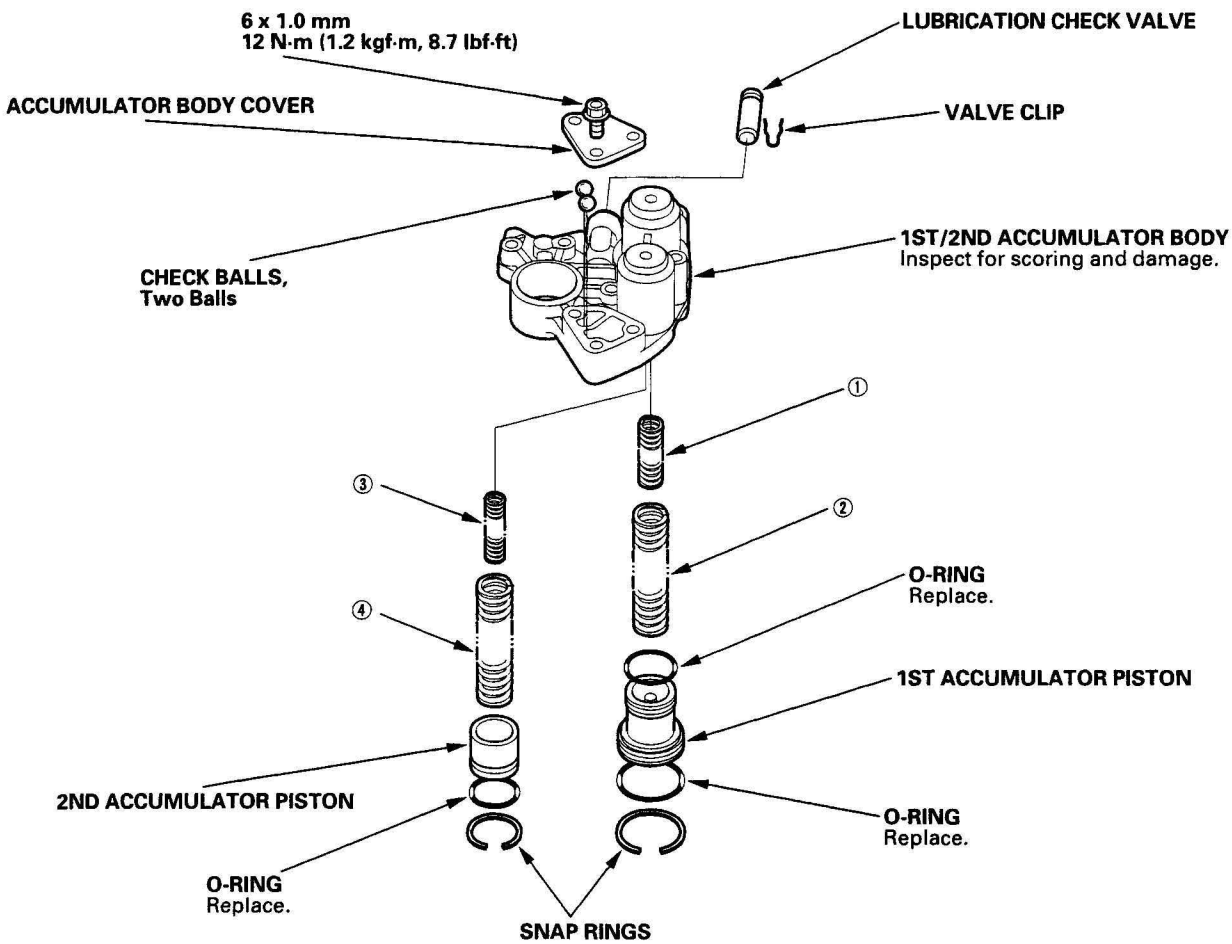
No.	Springs	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	CPC valve C spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
②	Shift valve E spring	0.8 (0.031)	7.1 (0.280)	49.0 (1.929)	17.2
③	5th accumulator spring A	2.2 (0.087)	16.4 (0.646)	75.7 (2.980)	14.2
④	5th accumulator spring B	2.0 (0.079)	10.0 (0.394)	45.5 (1.791)	11.6
⑤	4th/1st-hold accumulator spring	3.4 (0.134)	19.6 (0.772)	57.4 (2.260)	8.4

BACK

Protected by AR

Accumulator Body Disassembly, Inspection, and Reassembly

1. Do not use a magnet to remove the check balls; it may magnetize the balls.
2. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
3. Coat all parts with ATF during assembly.



SPRING SPECIFICATIONS

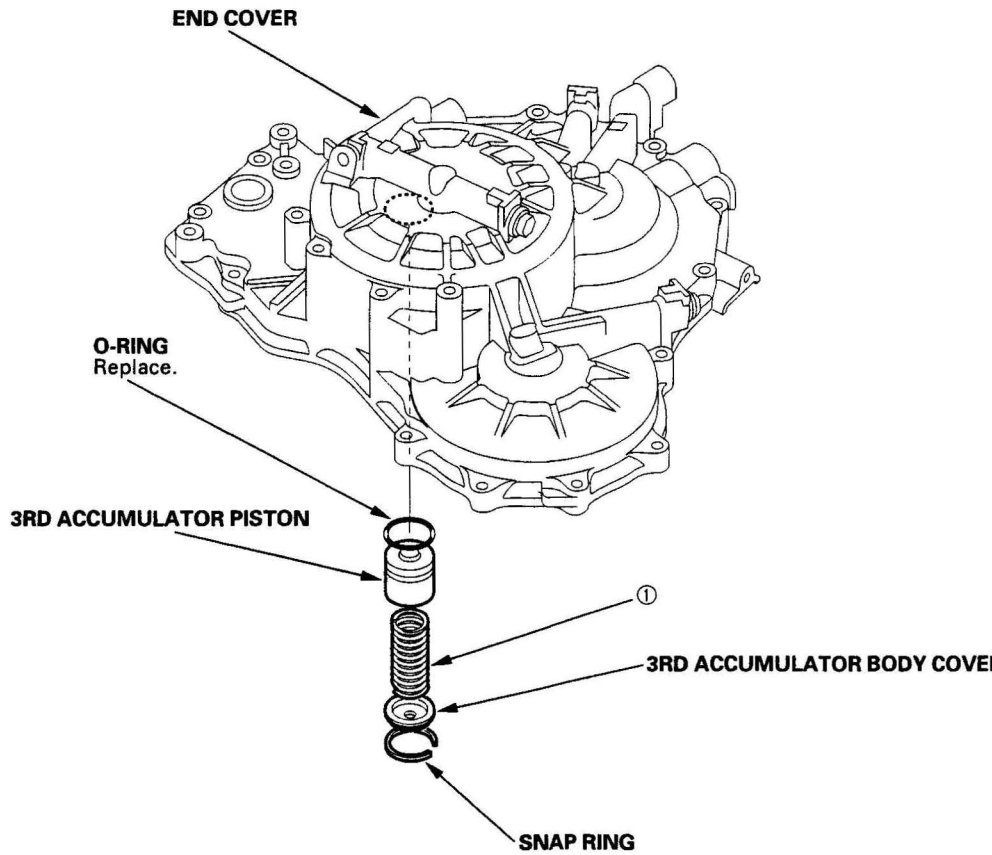
No.	Springs	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1st accumulator spring B	2.3 (0.091)	12.6 (0.496)	42.0 (1.654)	9.9
②	1st accumulator spring A	2.4 (0.094)	19.5 (0.768)	67.7 (2.665)	10.2
③	2nd accumulator spring B	2.6 (0.102)	13.0 (0.512)	44.0 (1.732)	9.0
④	2nd accumulator spring A	2.5 (0.098)	19.6 (0.772)	57.7 (2.272)	9.5

BACK

Protected by AR

3rd Accumulator/End Cover Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Coat all parts with ATF during assembly.



SPRING SPECIFICATIONS

No.	Springs	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	3rd accumulator spring	3.1 (0.122)	19.6 (0.772)	39.4 (1.551)	5.5

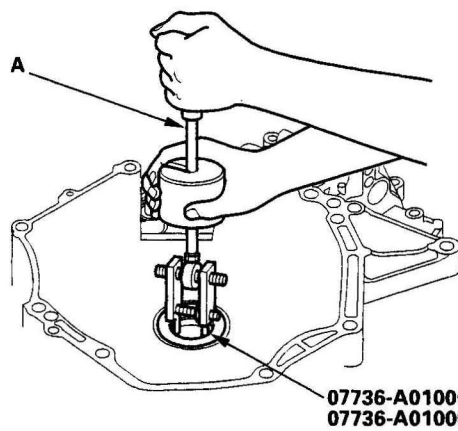
BACK

Protected by AR

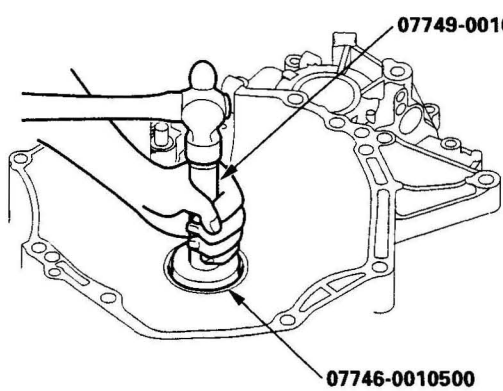
Mainshaft Bearing and Oil Seal Replacement

Special Tools Required
- Adjustable bearing puller, 25 – 40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500
- Attachment, 72 x 75 mm 07746-0010600

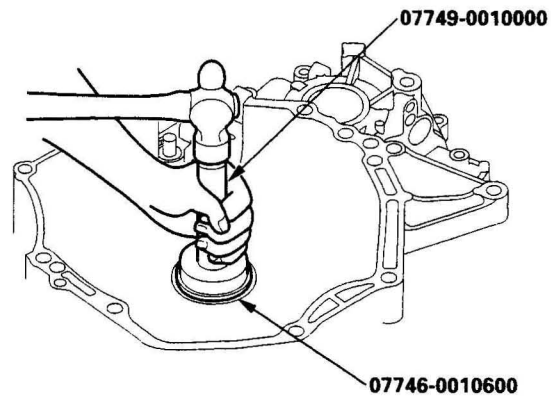
1. Remove the mainshaft bearing and oil seal with the special tool and a commercially available 3/8"-16 slide hammer (A).



2. Install the new mainshaft bearing until it bottoms in the housing with the special tools.



3. Install the new oil seal flush to the housing with the special tools.

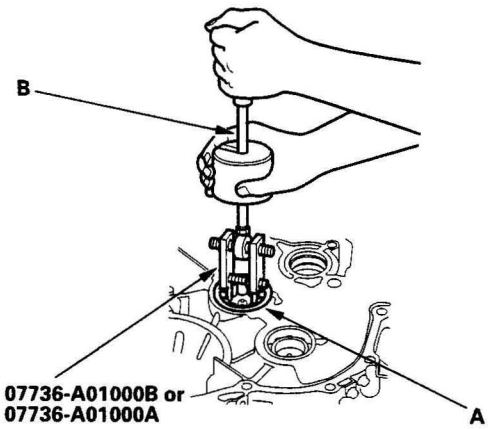


Protected by AR

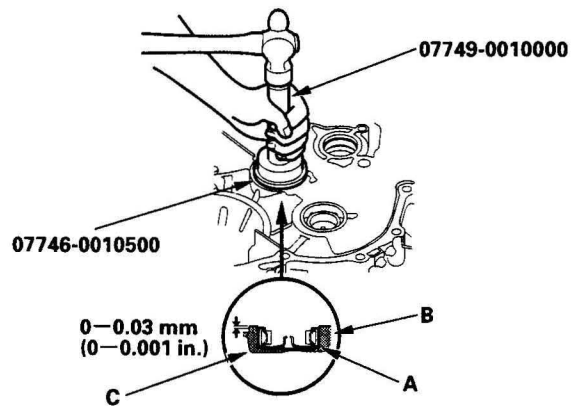
Countershaft Bearing Replacement

Special Tools Required
- Adjustable bearing puller, 25—40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

1. Remove the countershaft bearing (A) with the special tool and a commercially available 3/8"-16 slide hammer (B).



2. Install the ATF guide plate (A).

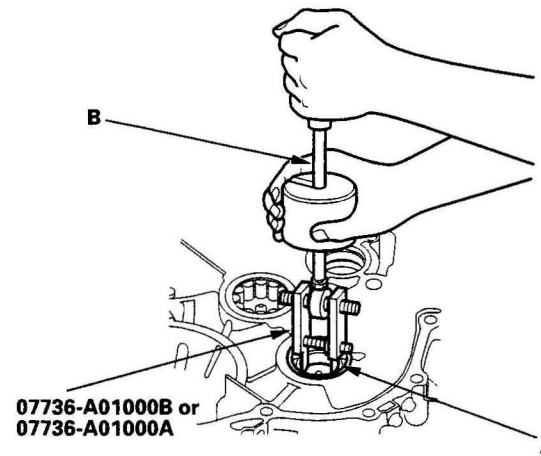


3. Install the new bearing (B) into the housing (C) with the special tools.

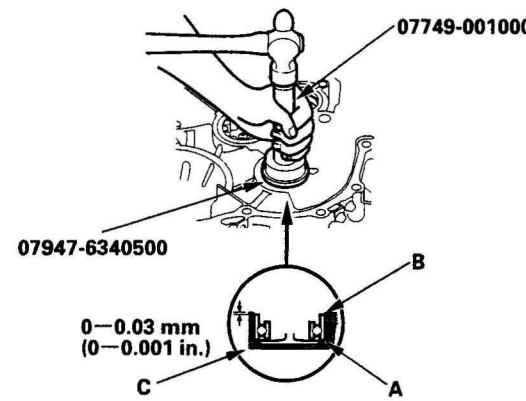
Secondary Shaft Bearing Replacement

Special Tools Required
- Adjustable bearing puller, 25—40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Driver attachment 07947-6340500

1. Remove the secondary shaft bearing (A) with the special tool and a commercially available 3/8"-16 slide hammer (B).



2. Install the ATF guide plate (A).



3. Install the new bearing (B) into the housing (C) with the special tools.

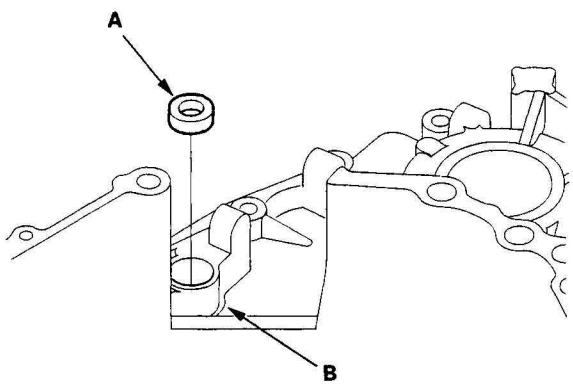
BACK

Protected by AR

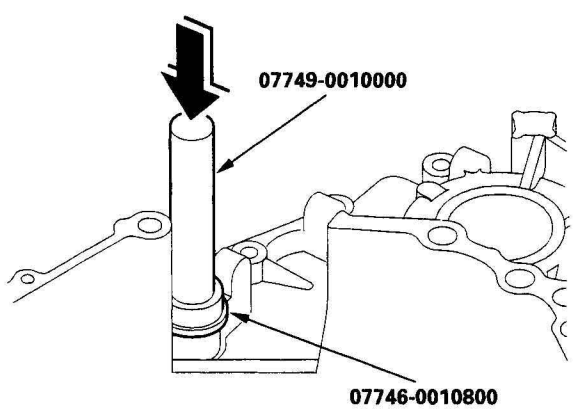
Control Shaft Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal (A) from the torque converter housing (B).



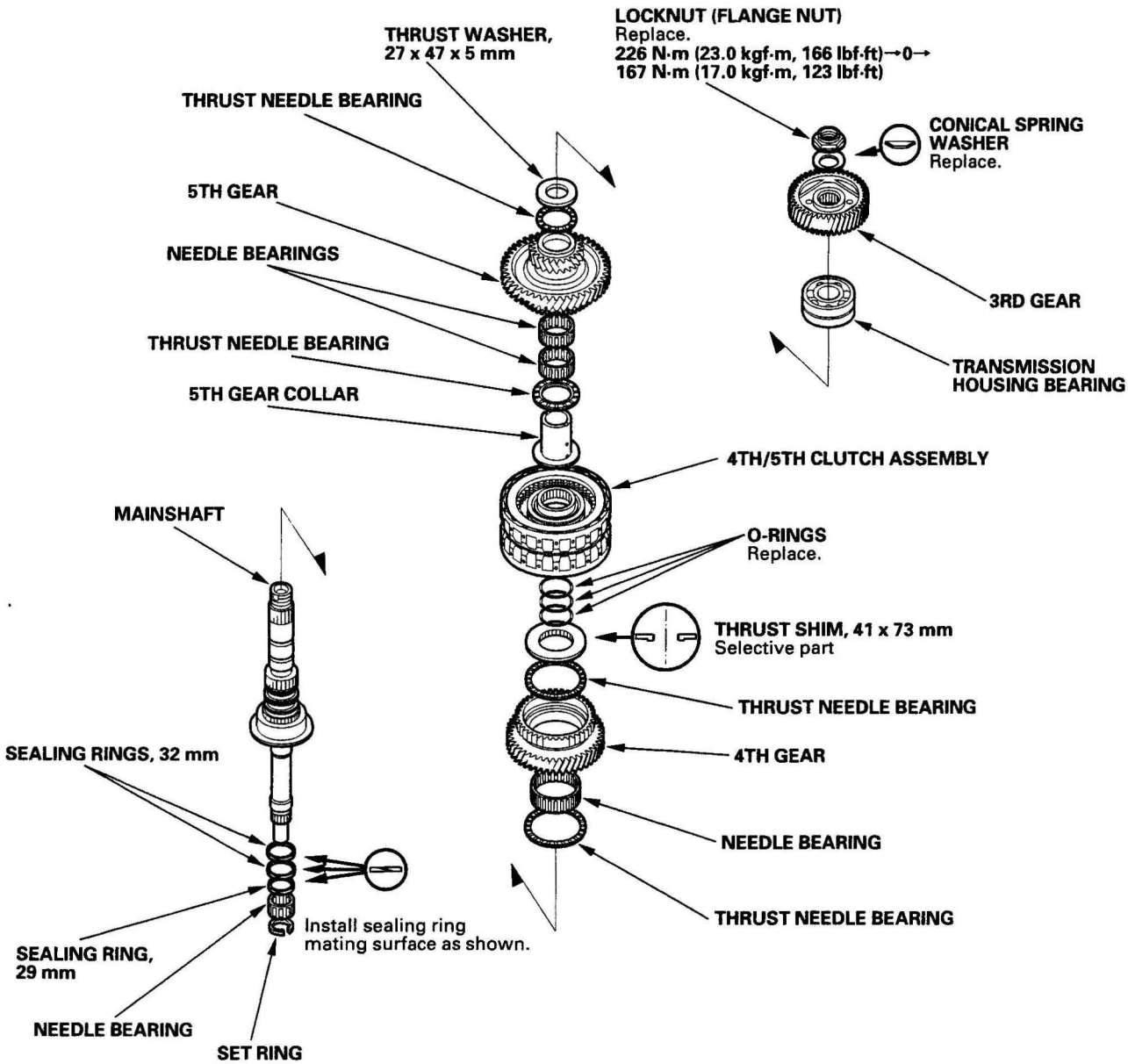
2. Install the new oil seal flush to the torque converter housing with the special tools.



Protected by AR

Mainshaft Disassembly, Inspection, and Reassembly

1. Lubricate all parts with ATF during assembly.



2. Check the clearance of the 4th/5th clutch assembly.
3. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
4. Inspect the splines for excessive wear and damage.
5. Check shaft bearing surfaces for scoring and excessive wear.
6. Before installing the O-rings, wrap the shaft splines with tape to prevent O-ring damage.
7. Install the conical spring washer and 41 x 73 mm thrust washer in the direction shown.
8. Inspect the condition of the sealing rings. If the sealing rings are worn, distorted, or damaged, replace them (see page 14-424).

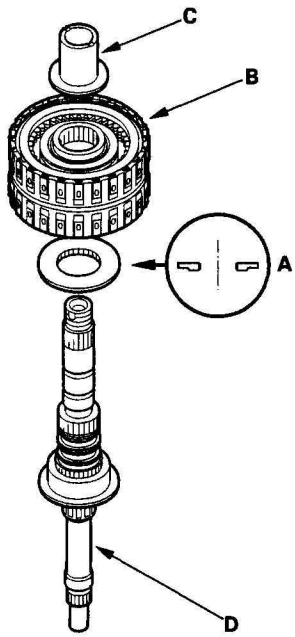
BACK

Protected by AR

4th/5th Clutch Clearance Inspection

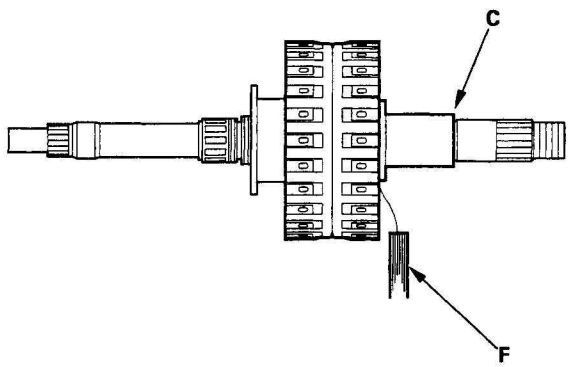
1. Remove the O-rings from the mainshaft.

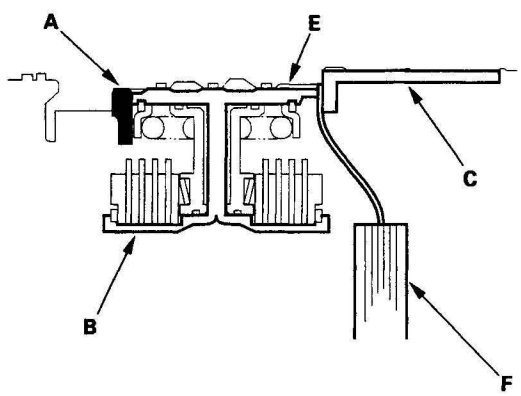
2. Assemble the 41 x 73 mm thrust shim (A), 4th/5th clutch assembly (B), and 5th gear collar (C) on the mainshaft (D).



3. Hold the 5th gear collar (C) against the clutch assembly (B), then measure the clearance between the clutch guide (E) and the 5th gear collar with a feeler gauge (F) in at least three places. Use the average as the actual clearance.

STANDARD: 0.03—0.11 mm (0.001—0.004 in.)





4. If the clearance is out of standard, remove the thrust shim and measure its thickness.

5. Select and install a new shim, then recheck.

THRUST SHIM, 41 x 73 mm

No.	Part Number	Thickness
1	90414-P7W-000	7.85 mm (0.309 in.)
2	90415-P7W-000	7.90 mm (0.311 in.)
3	90416-P7W-000	7.95 mm (0.313 in.)
4	90417-P7W-000	8.00 mm (0.315 in.)
5	90418-P7W-000	8.05 mm (0.317 in.)
6	90419-P7W-000	8.10 mm (0.319 in.)

6. After replacing the thrust shim, make sure the clearance is within standard.

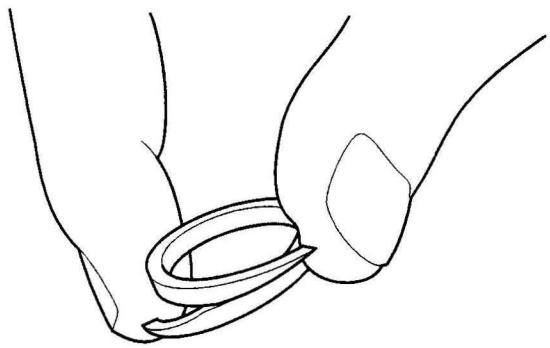
BACK

Protected by AR

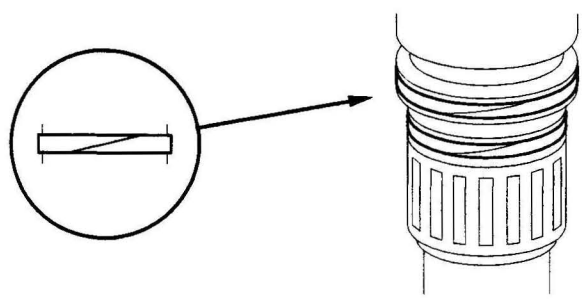
Mainshaft Sealing Rings Replacement

The sealing rings are synthetic resin with chamfered ends. Check the condition of the sealing rings, and replace them only if they are worn, distorted, or damaged.

1. For a better fit, squeeze sealing rings together slightly before installing them.



2. Apply ATF to the new sealing rings then install them on the mainshaft.



3. After installing the sealing rings, verify the following:

   - The rings are fully seated in the groove.
   - The rings are not twisted.
   - The chamfered ends of the rings are properly joined.

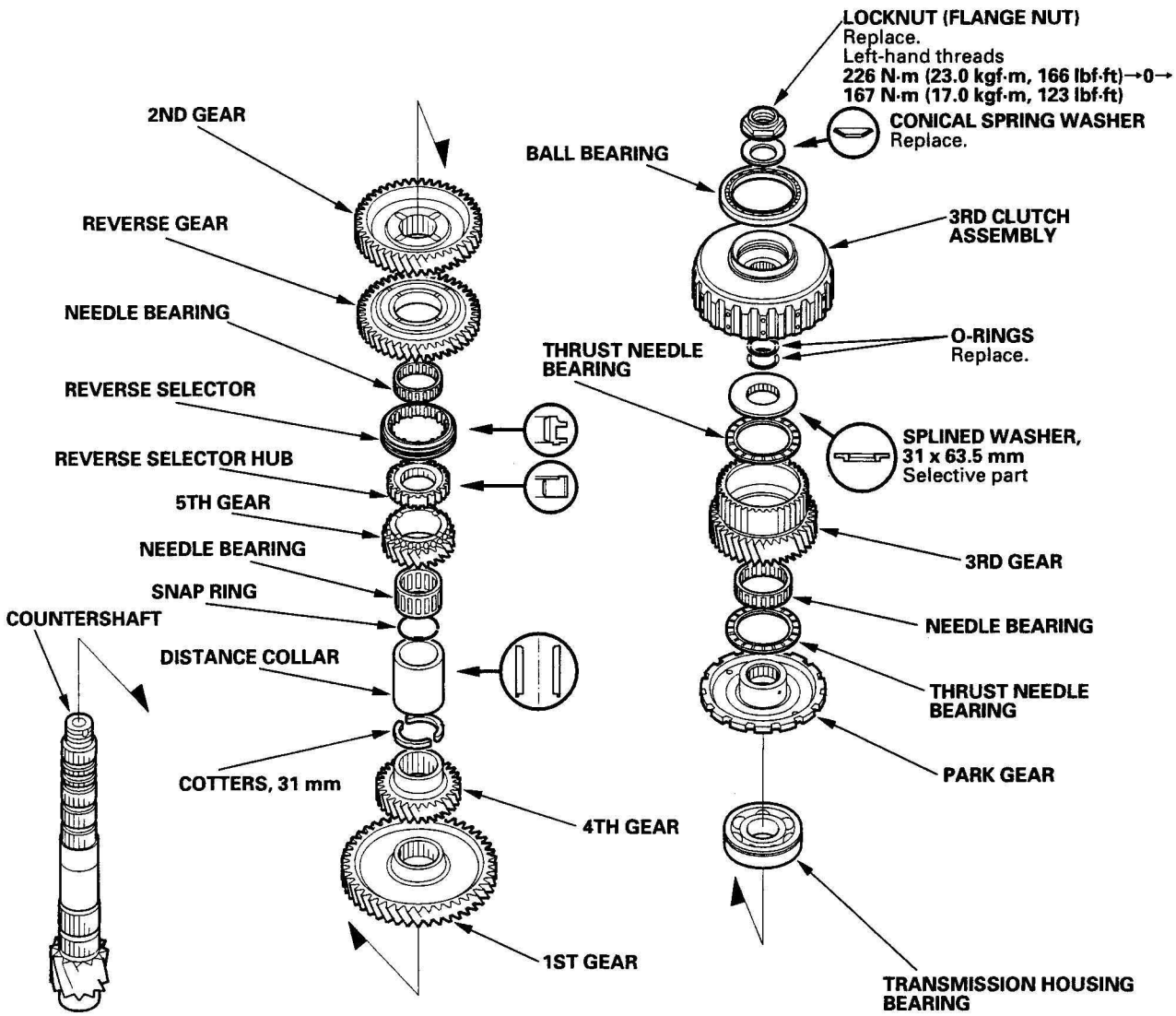
BACK

Protected by AR

Countershaft Disassembly, Inspection, and Reassembly

'00-01 Models:

1. Remove the locknut, and take off components down to the reverse selector hub.



2. Remove the reverse selector hub, 4th gear, and 1st gear (see page 14-427).
3. Check the bearing on the 3rd clutch for wear and rough movement. If the bearing is worn or damaged, replace it (see page 14-429).
4. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
5. Check the splines for excessive wear and damage.
6. Check the shaft bearing surfaces for scoring and excessive wear.
7. Lubricate all parts with ATF, and reassemble the shafts and gears.
8. Install the conical spring washer, 31 x 63.5 mm splined washer, reverse selector, reverse selector hub, and distance collar in the direction shown.

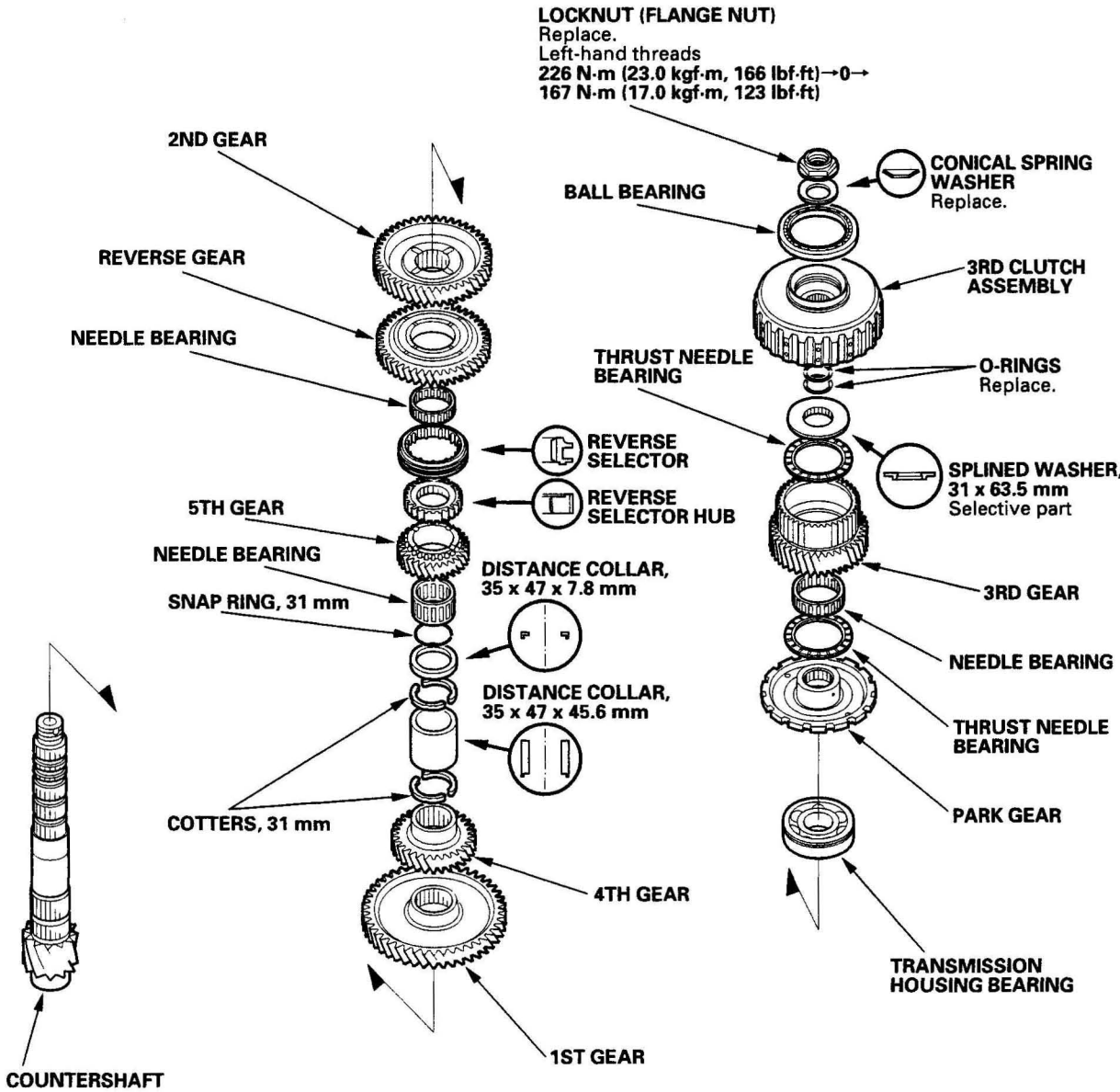
BACK

Protected by AR

Countershaft Disassembly, Inspection, and Reassembly (cont'd)

'02-03 Models:

1. Remove the locknut, and take off components down to the reverse selector hub.



2. Remove the reverse selector hub, 4th gear, and 1st gear (see page 14-427).
3. Check the bearing on the 3rd clutch for wear and rough movement. If the bearing is worn or damaged, replace it (see page 14-429).
4. Inspect the thrust needle bearing and the needle bearing for ga[illegible]ng and rough movement.
5. Check the splines for excessive wear and damage.
6. Check the shaft bearing surfaces for scoring and excessive wear.
7. Lubricate all parts with ATF, and reassemble the shafts and gears.
8. Install the distance collars, reverse selector hub, reverse selector, splined washer, and conical spring washer in the direction shown.

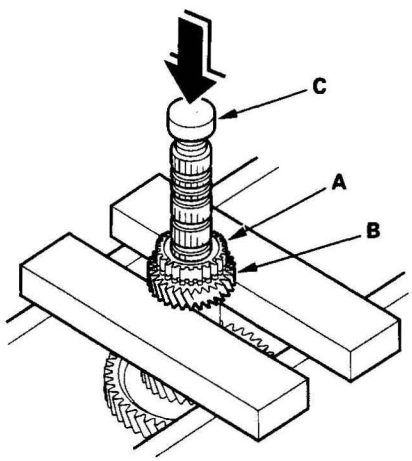
BACK

Protected by AR

Countershaft Reverse Selector Hub and 4th Gear Removal

1. Remove the reverse selector hub (A) and the 5th gear (B) from the countershaft with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the countershaft.

   NOTE: Some reverse selector hubs are not press-fitted, and can be removed without using a puller.

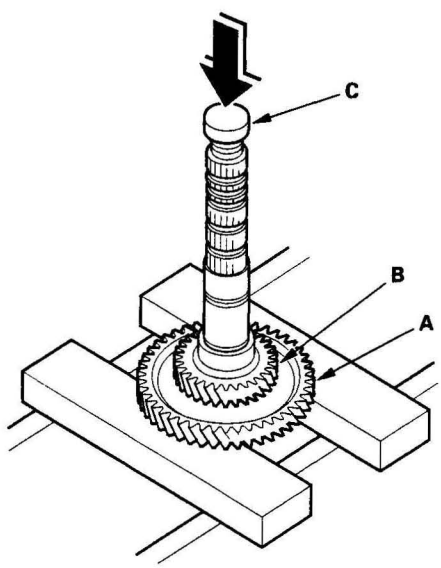


2. Remove the following parts from the countershaft:

   - '00-01 models:
     - Needle bearing
     - Snap ring
     - Distance collar
     - Cotters, 31 mm

   - '02-03 models:
     - Needle bearing
     - Snap ring
     - Distance collar, 35 x 47 x 7.8 mm
     - Cotters, 31 mm
     - Distance collar, 35 x 47 x 45.6 mm
     - Cotters, 31 mm

3. Remove the 1st gear (A) and 4th gear (B) together from the countershaft with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the countershaft.



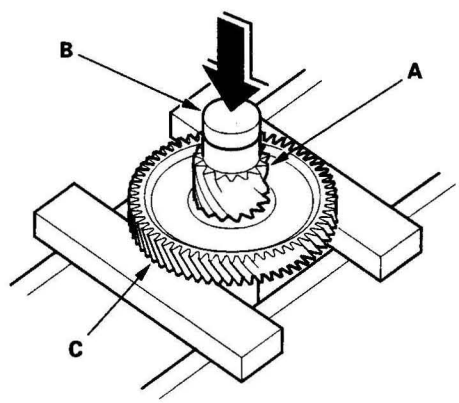
BACK

Protected by AR

Countershaft 4th Gear and Reverse Selector Hub Installation

Special Tool Required
Driver, 40 mm I.D. 07746-0030100

1. Apply ATF to the parts.
2. Install the 1st gear on the countershaft by hand.
3. Align the shaft splines with those on 4th gear, then press the countershaft (A) into the 4th gear with a press. Place an attachment (B) between the press and countershaft to prevent damaging the countershaft.



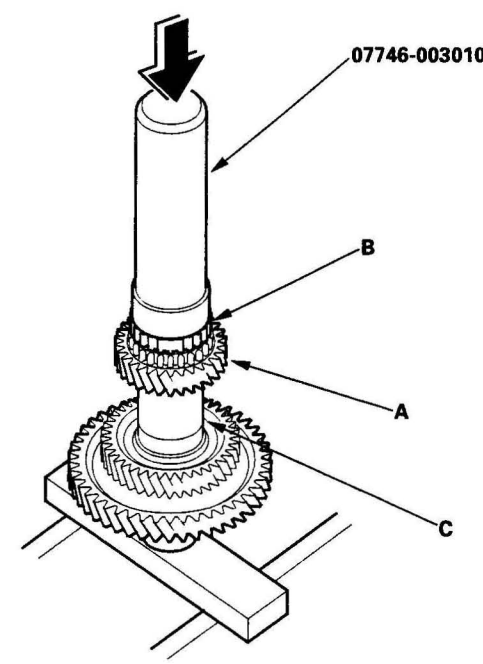
4. Stop pressing the countershaft when the 4th gear contacts the 1st gear (C).
5. Install the following parts on the countershaft:

   - '00-01 models:
     - Cotters, 31 mm
     - Distance collar
     - Snap ring
     - Needle bearing
     - 5th gear (A)

   - '02-03 models:
     - Cotters, 31 mm
     - Distance collar, 35 x 47 x 45.6 mm
     - Cotters, 31 mm
     - Distance collar, 35 x 47 x 7.8 mm
     - Snap ring
     - Needle bearing
     - 5th gear (A)

6. Slide the reverse selector hub (B) over the countershaft (C), and then press it into place with the special tool and a press.

   NOTE: Some reverse selector hubs are not press-fitted and can be installed without using the special tool and a press.



BACK

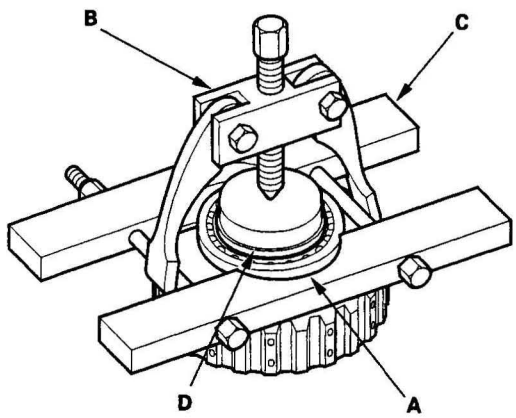
Protected by AR

3rd Clutch Ball Bearing Replacement

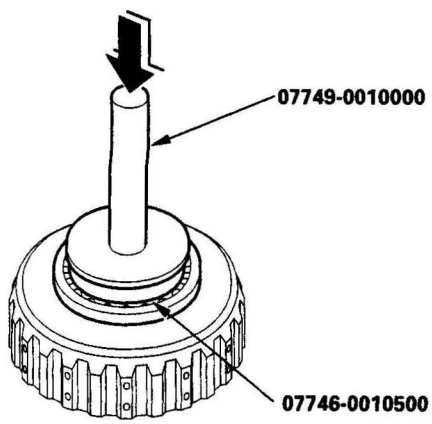
Special Tools Required
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

NOTE: Check the bearing for wear and rough movement. If the bearing is OK, removal is not necessary.

1. Remove the ball bearing (A) from the 3rd clutch with a commercially available bearing puller (B), bearing separator (C), and stepper adapter (D).



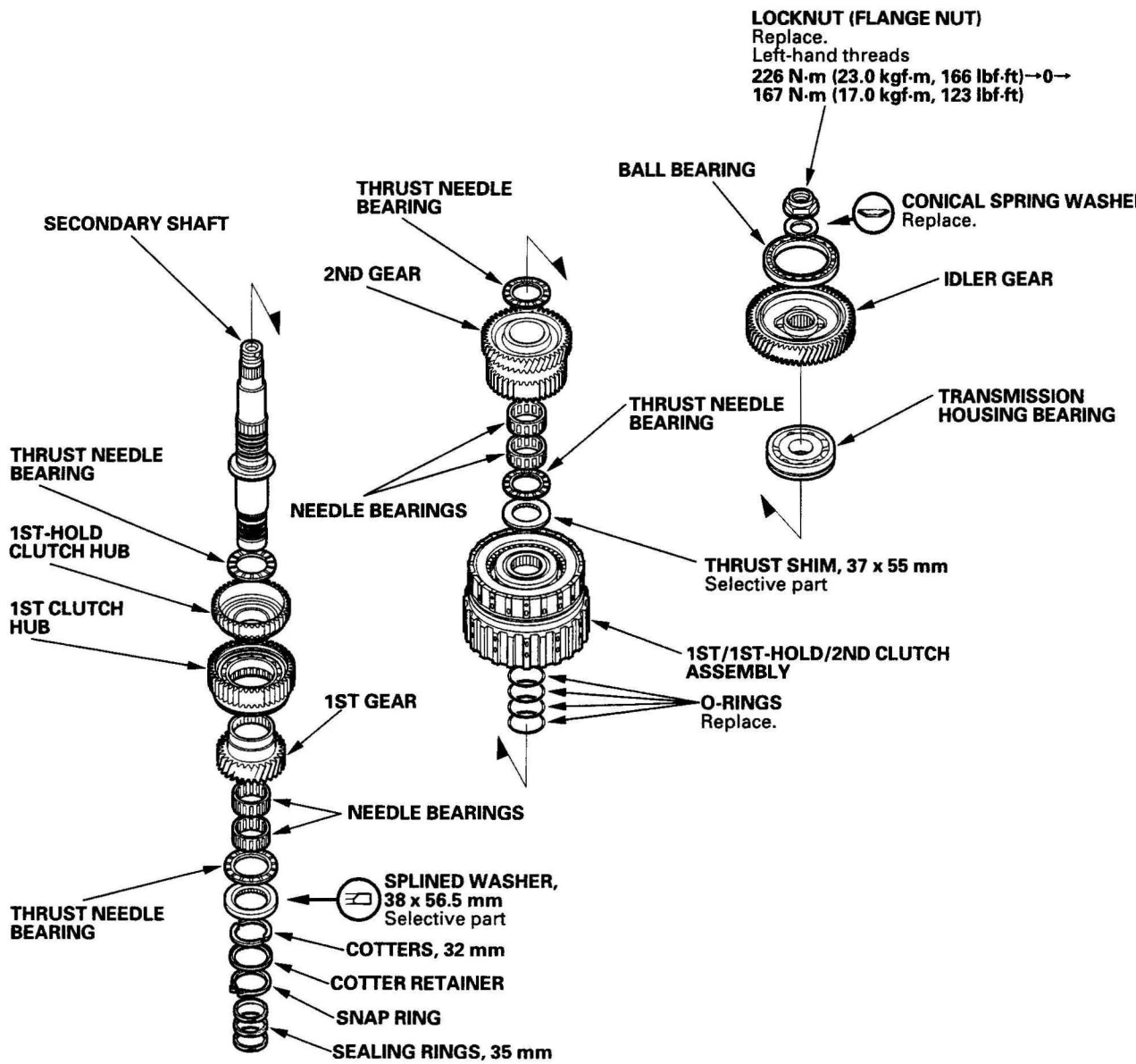
2. Install the new bearing on the 3rd clutch with the special tools and a press.



Protected by AR

Secondary Shaft Disassembly, Inspection, and Reassembly

1. Remove the locknut, and disassemble the shaft and gears.



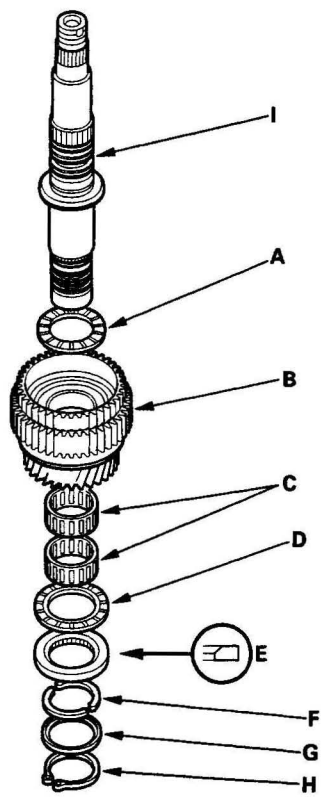
2. Inspect the thrust needle bearing and needle bearing for galling and rough movement.
3. Check the clearance of the secondary shaft assembly.
4. Check the splines for excessive wear and damage.
5. Check the shaft bearing surfaces for scoring and excessive wear.
6. Check the idler gear bearing for wear and rough movement. If the bearing is worn or damaged, replace it (see page 14-433).
7. Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.
8. Lubricate all parts with ATF during reassembly.
9. Install the conical spring washer and splined washer in the direction shown.

BACK

Protected by AR

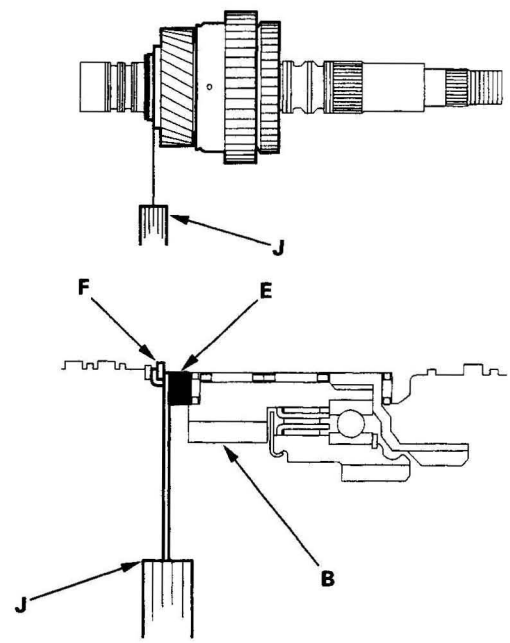
Secondary Shaft Clearance Inspection

1. Remove the O-rings from the secondary shaft.
2. Assemble the thrust needle bearing (A), 1st gear assembly (B), needle bearings (C), thrust needle bearing (D), 38 x 56.5 mm splined washer (E), 32 mm cotters (F), cotter retainer (G), and snap ring (H) on the secondary shaft (I).



3. Measure the clearance between the 38 x 56.5 mm splined washer (E) and cotters (F) with a feeler gauge (J) in at least three places. Use the average as the actual clearance.

STANDARD: 0.07 – 0.15 mm (0.003 – 0.006 in.)



4. If the measurement is out of standard, remove the splined washer, and measure its thickness.
5. Select and install a new splined washer, then recheck the clearance.

SPLINED WASHER, 38 x 56.5 mm

No.	Part Number	Thickness
1	90502-P0Z-000	6.85 mm (0.270 in.)
2	90503-P0Z-000	6.90 mm (0.272 in.)
3	90504-P0Z-000	6.95 mm (0.274 in.)
4	90505-P0Z-000	7.00 mm (0.276 in.)
5	90506-P0Z-000	7.05 mm (0.278 in.)
6	90507-P0Z-000	7.10 mm (0.280 in.)

(cont'd)

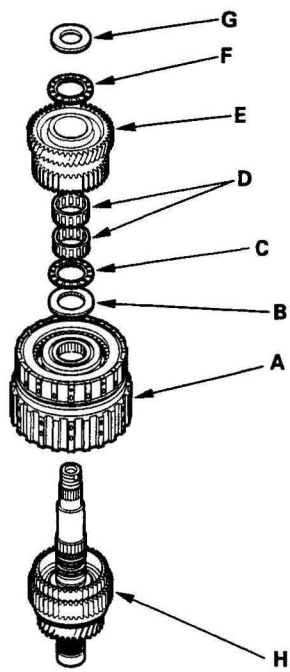
BACK

Protected by AR

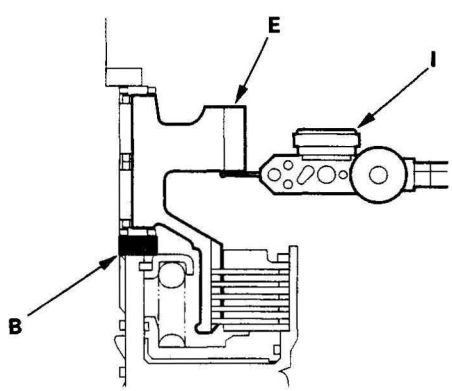
Secondary Shaft Clearance Inspection (cont'd)

6. Remove the 27 x 47 x 5 mm thrust washer from the mainshaft.

7. Assemble the 1st/1st-hold/2nd clutch assembly (A), 37 x 55 mm thrust washer (B), thrust needle bearing (C), needle bearings (D), 2nd gear (E), thrust needle bearing (F), and 27 x 47 x 5 mm thrust washer (removed from mainshaft) (G) on the secondary shaft sub-assembly (H).

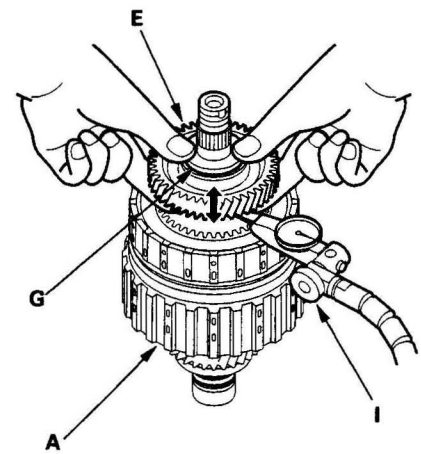


8. Set the dial indicator (I) on the 2nd gear (E).



9. Hold the 27 x 47 x 5 mm thrust washer (G) against the clutch assembly (A), and measure the 2nd gear axial clearance in at least three places while moving the 2nd gear (E). Use the average as the actual clearance.

STANDARD: 0.04–0.12 mm (0.002–0.005 in.)



10. If the measurement is out of standard, remove the 37 x 55 mm thrust washer and measure its thickness.

11. Select and install a new thrust washer, then recheck the clearance.

THRUST SHIM, 37 x 55 mm

No.	Part Number	Thickness
1	90406-P0Z-000	4.90 mm (0.193 in.)
2	90407-P0Z-000	4.95 mm (0.195 in.)
3	90408-P0Z-000	5.00 mm (0.197 in.)
4	90409-P0Z-000	5.05 mm (0.199 in.)
5	90410-P0Z-000	5.10 mm (0.20[illegible] in.)
6	90411-P0Z-000	5.15 mm (0.20[illegible] in.)
7	90412-P0Z-000	5.20 mm (0.205 in.)

12. Disassemble the shaft and gears.

13. Reinstall the 27 x 47 x 5 mm thrust washer on the mainshaft.

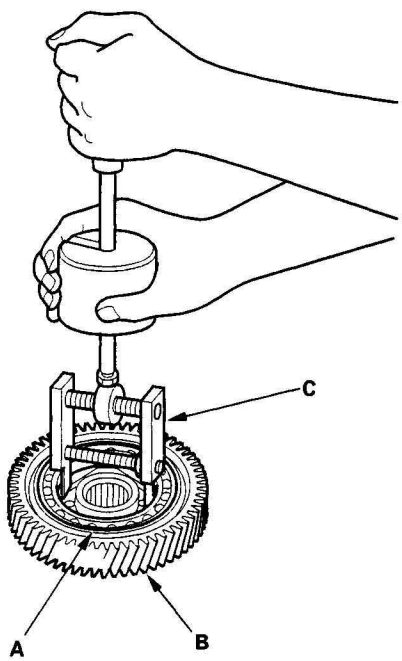
BACK

Protected by AR

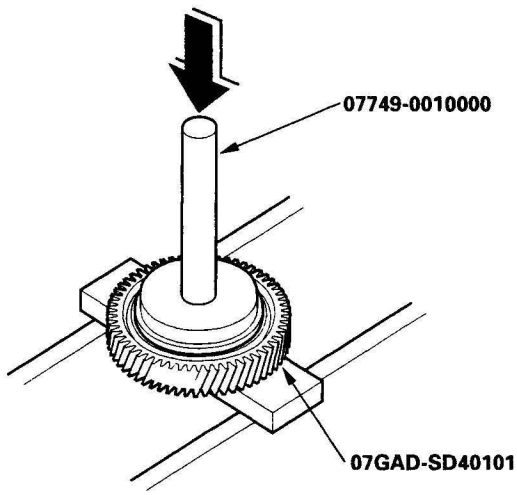
Secondary Shaft Idler Gear Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 78 x 90 mm 07GAD-SD40101

1. Check the bearing for wear, damage, and rough movement. If the bearing is worn or damaged, go to step 2.
2. Place the secondary shaft idler gear in a vise with soft jaws.
3. Remove the bearing (A) from the secondary shaft idler gear (B) with a puller (C).



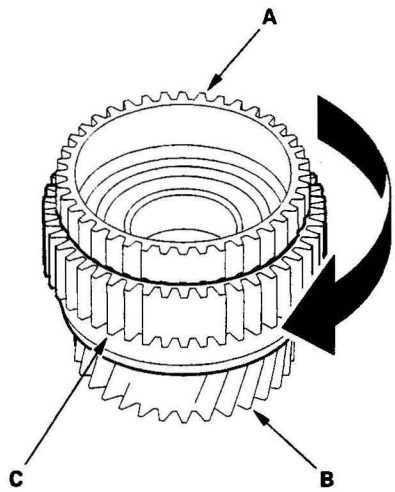
4. Install the bearing on the secondary shaft idler gear with the special tools and a press.



Protected by AR

1st Gear One-way Clutch Inspection

1. Hold the 1st-hold clutch hub (A), and turn the 1st gear (B) in the direction shown to be sure it turns freely. Also make sure the 1st gear does not turn in the opposite direction.

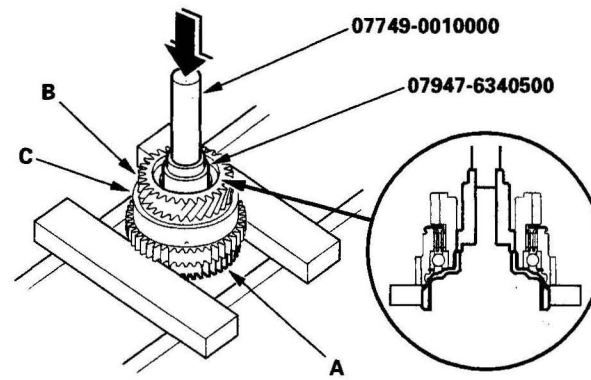


2. If any problem occurs on the 1st gear one-way clutch, replace the 1st clutch hub (C). The 1st gear one-way clutch is not available separately from the 1st clutch hub.

1st Clutch Hub Replacement

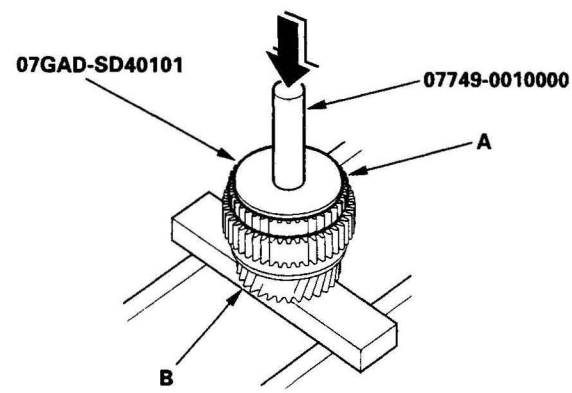
Special Tools Required
- Driver 07749-0010000
- Driver attachment 07947-6340500
- Attachment, 78 x 90 mm 07GAD-SD40101

1. Remove the 1st-hold clutch hub (A) from the 1st gear (B) with the special tools and a press.



2. Remove the 1st clutch hub (C) from the 1st gear, then install the new 1st clutch hub in the 1st gear.

3. Install the 1st-hold clutch hub (A) in the 1st gear (B) with the special tools and a press.



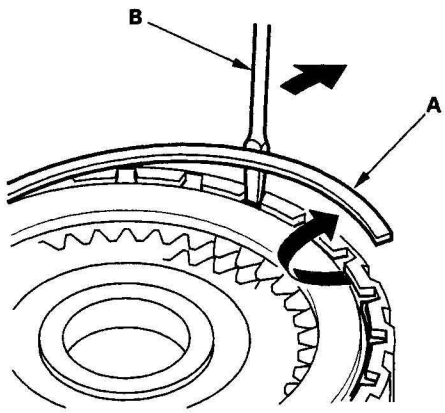
BACK

Protected by AR

Clutch Disassembly

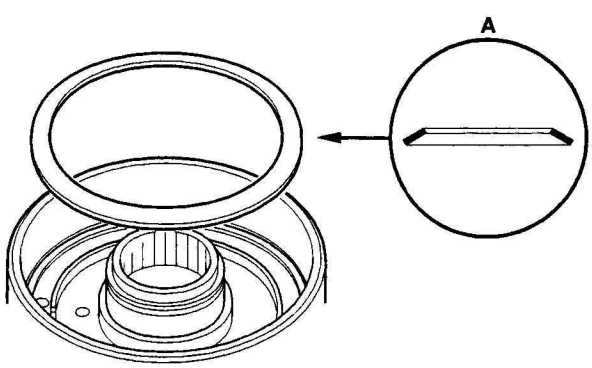
Special Tools Required
- Clutch spring compressor attachment 07LAE-PX40100
- Clutch spring compressor attachment 07HAE-PL50101
- Clutch spring compressor bolt assembly 07GAE-PG40200 or 07GAE-PG4020A

1. Remove the snap ring (A), then remove the clutch end plate, the clutch discs, and the plates with a screwdriver (B).

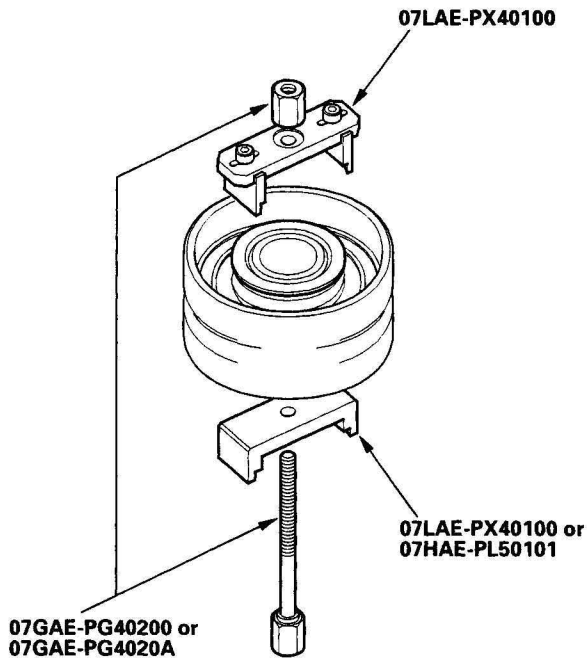


2. Remove the disc spring (A) from the 1st, 3rd, 4th and 5th clutches.

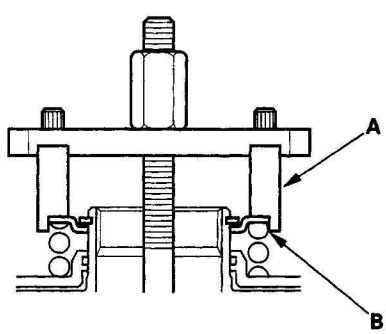
   NOTE: The 2nd clutch and 1st-hold clutch do not have a disc spring.



3. Install the special tools on the 4th/5th clutch assembly and 1st clutch.



4. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 4th, 5th and 1st clutches.



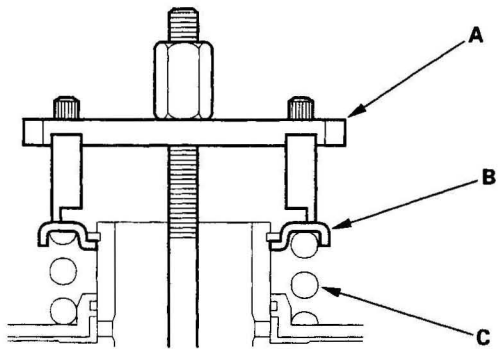
(cont'd)

BACK

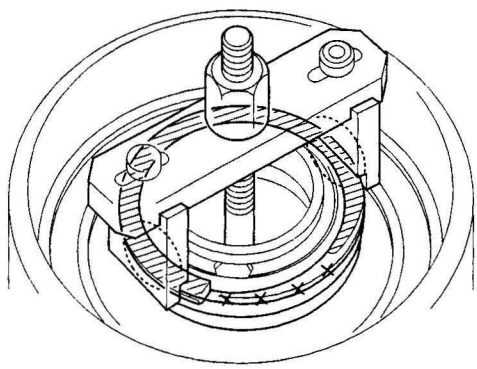
Protected by AR

Clutch Disassembly (cont'd)

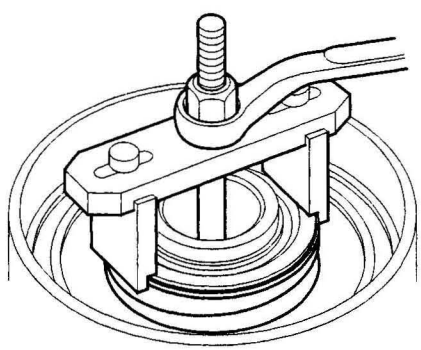
5. Set the special tool (A) on the spring retainer (B) of the 2nd and 3rd clutches so the tool works on the clutch return spring (C).



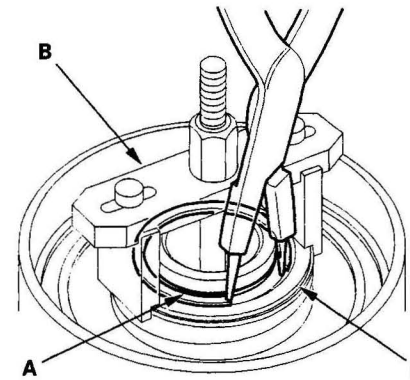
6. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



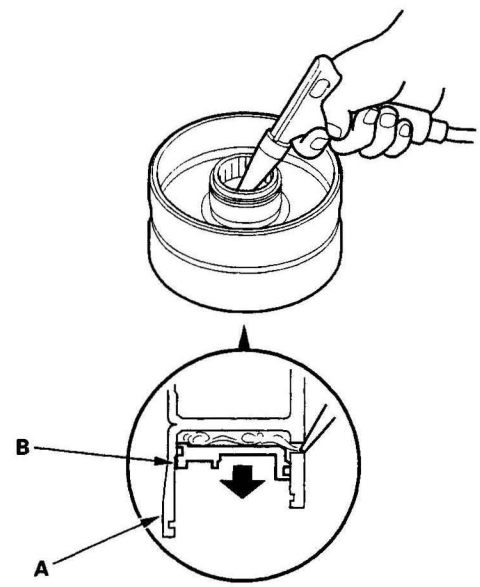
7. Compress the spring until the snap ring can be removed.



8. Remove the snap ring (A). Then remove the special tool (B), spring retainer (C), and the return spring.



9. Wrap a shop rag around the clutch drum (A), and apply air pressure to the fluid passage to remove the piston (B). Place a finger tip on the other end while applying air pressure.



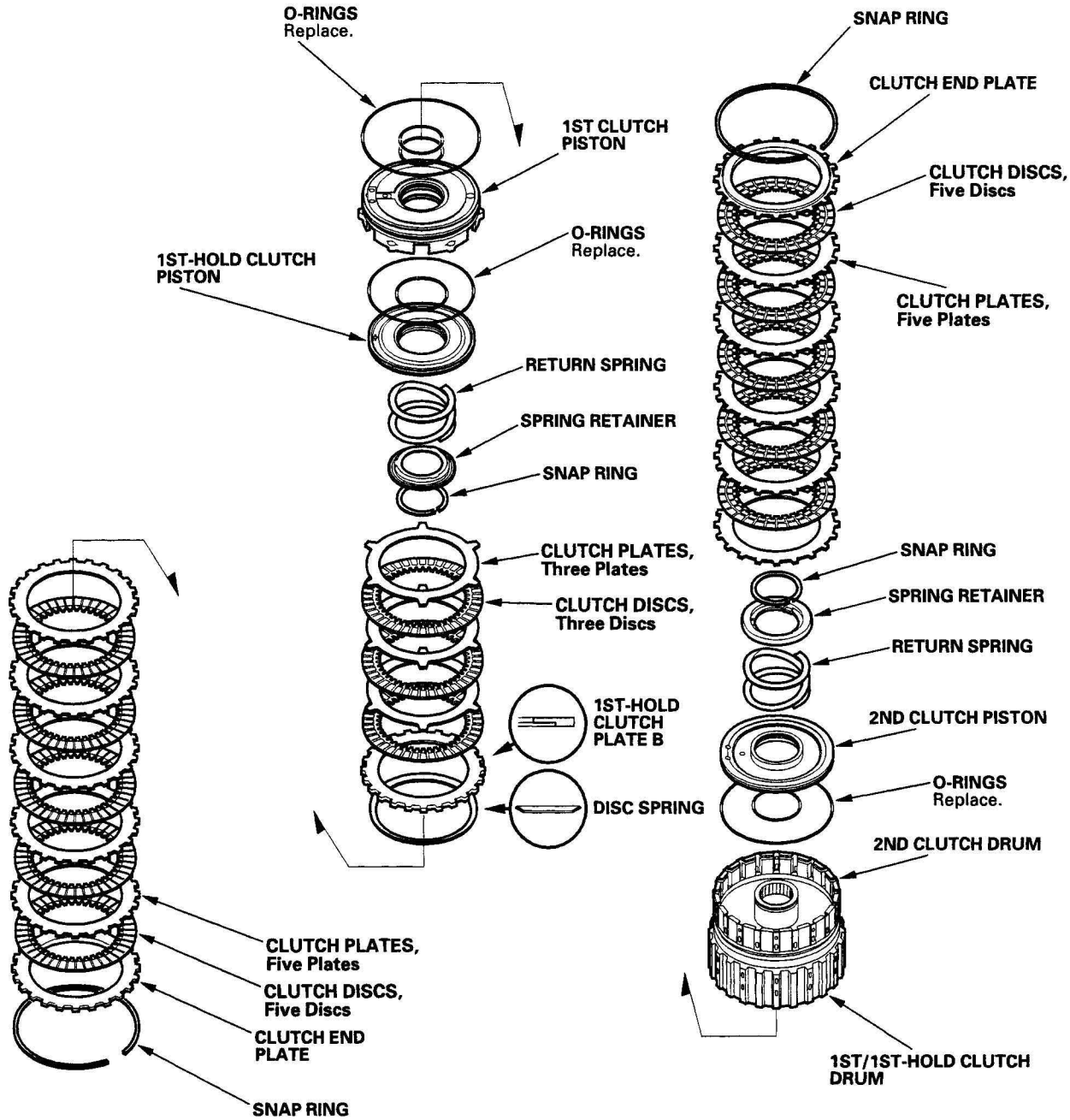
BACK

Protected by AR

Clutch Inspection

1st/1st-hold/2nd Clutch — Premium Model

- Clutch disc standard thickness: 1.94 mm (0.076 in.)
- Clutch plate standard thickness:
  - 1st clutch: 1.6 mm (0.063 in.)
  - 2nd clutch: 1.6 mm (0.063 in.)
  - 1st-hold clutch: 1.8 mm (0.071 in.)



(cont'd)

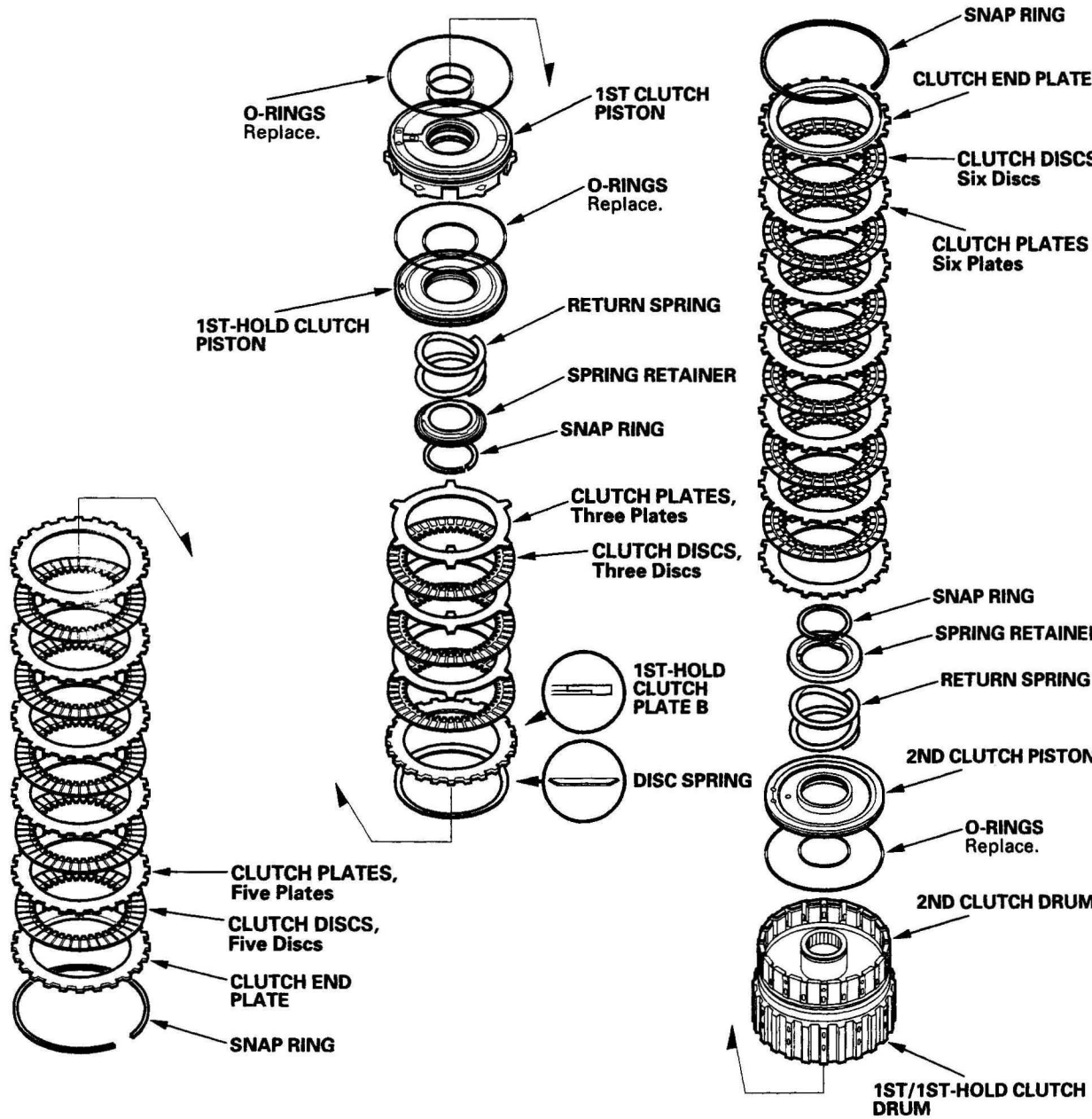
BACK

Protected by AR

Clutch Inspection (cont'd)

1st/1st-hold/2nd Clutch-Type S Model

- Clutch disc standard thickness: 1.94 mm (0.076 in.)
- Clutch plate standard thickness:
  - 1st clutch: 1.6 mm (0.063 in.)
  - 2nd clutch: 1.6 mm (0.063 in.)
  - 1st-hold clutch: 1.8 mm (0.071 in.)

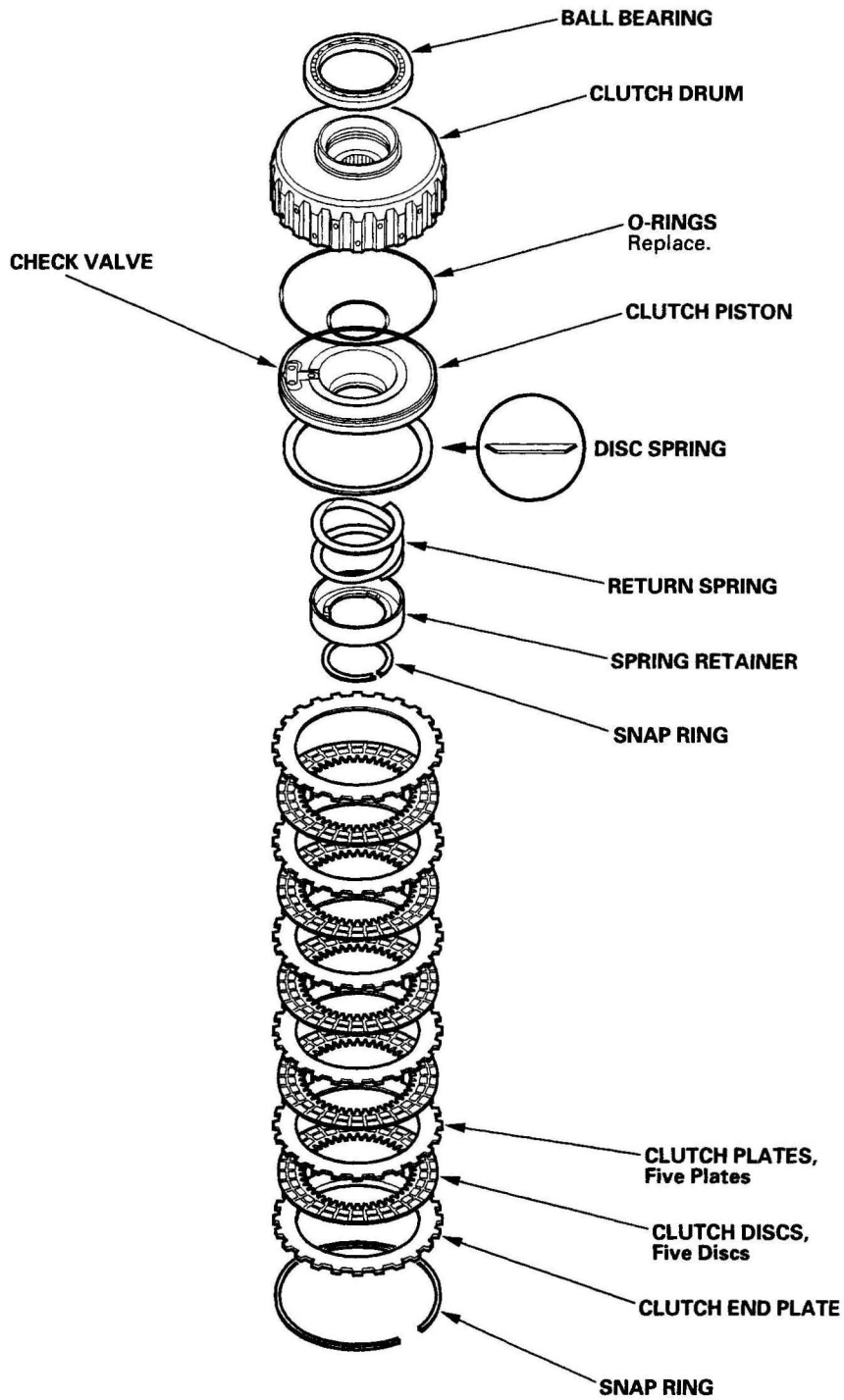


BACK

Protected by AR

3rd Clutch

- Clutch disc standard thickness: 1.94 mm (0.076 in.)
- Clutch plate standard thickness: 2.3 mm (0.091 in.)



(cont'd)

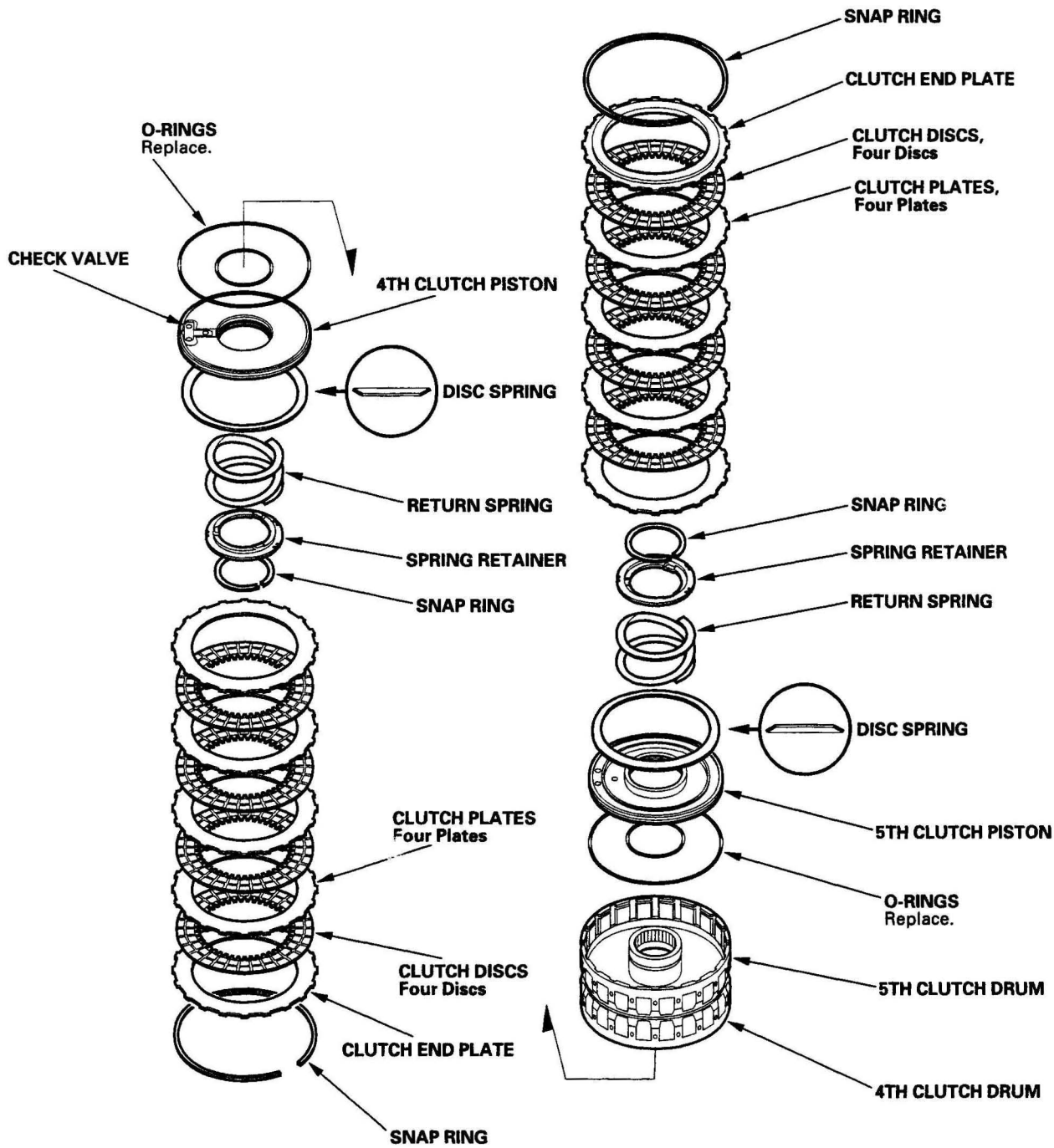
BACK

Protected by AR

Clutch Inspection (cont'd)

4th/5th Clutch

- Clutch disc standard thickness: 1.94 mm (0.076 in.)
- Clutch plate standard thickness:
  - 4th clutch: 2.3 mm (0.091 in.)
  - 5th clutch: 2.0 mm (0.079 in.)



BACK

Protected by AR

Clutch Reassembly

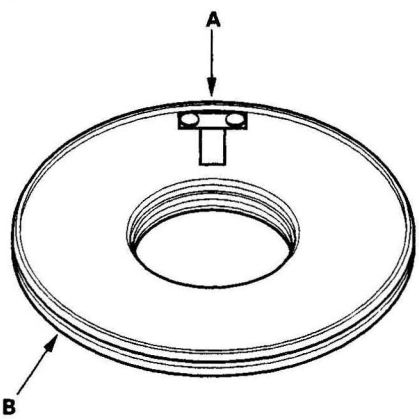
Special Tools Required
- Clutch spring compressor attachment 07LAE-PX40100
- Clutch spring compressor attachment 07HAE-PL50101
- Clutch spring compressor bolt assembly 07GAE-PG40200 or 07GAE-PG4020A
- Clutch compressor attachment 07ZAE-PRP0100

Note these items during reassembly:

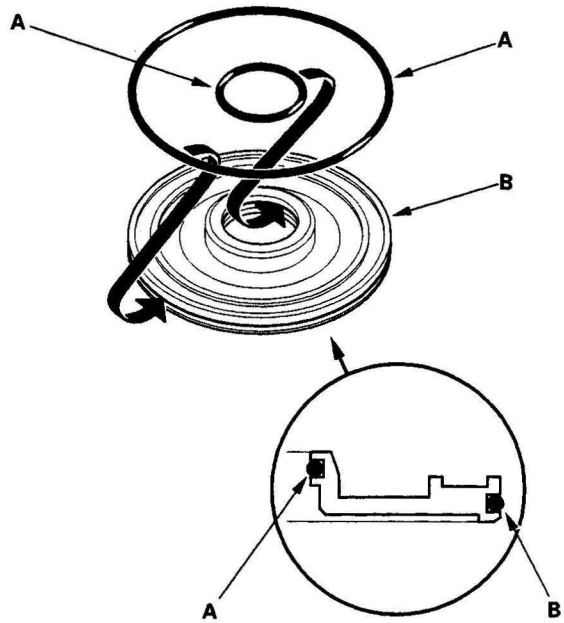
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air.
- Blow out all passages.
- Apply ATF to all parts before assembly.

1. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.

2. Inspect the check valve (A) on the clutch pistons (B). If the check valve is loose or stuck, replace the piston.

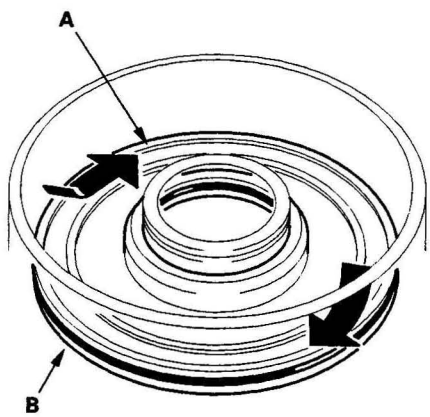


3. Install new O-rings (A) on the piston (B).



4. Install the piston (A) in the clutch drum (B). Apply pressure and rotate to ensure proper seating. Lubricate the piston O-ring with ATF before installing.

   NOTE: Do not pinch the O-ring by installing the piston with too much force.



(cont'd)

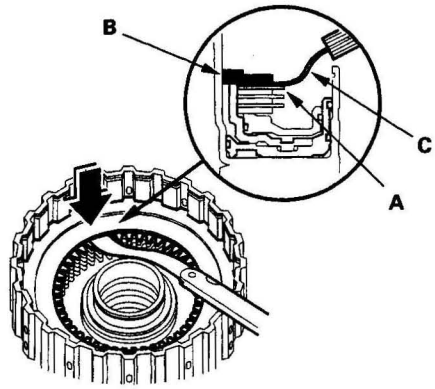
Protected by AR

Clutch Reassembly (cont'd)

5. Check the 1st-hold clutch plate-to-top-disc clearance; starting with a clutch plate, alternately install the clutch plate and discs in the 1st-hold clutch drum, then install the 1st-hold clutch plate B.

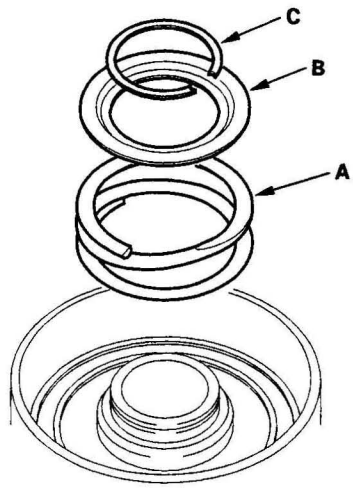
6. Measure the 1st-hold clutch clearance between the 1st-hold clutch plate B and the top disc (A) with a feeler gauge (C) while pressing the 1st-hold clutch plate B down. Take measurements in at least three places, and use the average as the actual clearance.

1st-hold Clutch Plate B-to-Top-disc Clearance
Service Limit: 0.5 – 0.9 mm (0.020 – 0.035 in.)

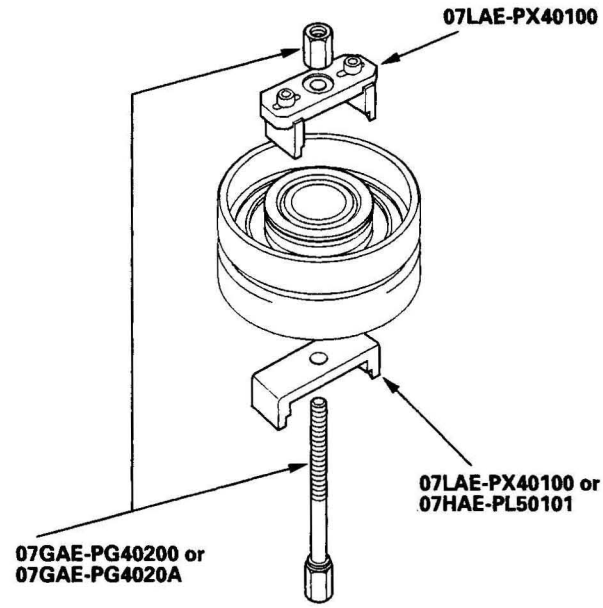


7. If the clearance is out of standard, replace the 1st-hold clutch plates and discs as a set, and recheck.

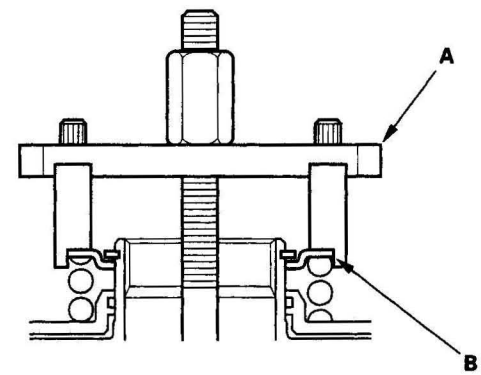
8. Install the return spring (A) and spring retainer (B), and position the snap ring (C) on the retainer.



9. Install the special tools on the clutch assembly.



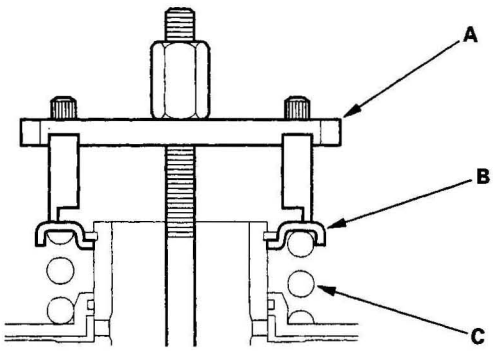
10. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 4th, 5th, and 1st clutches.



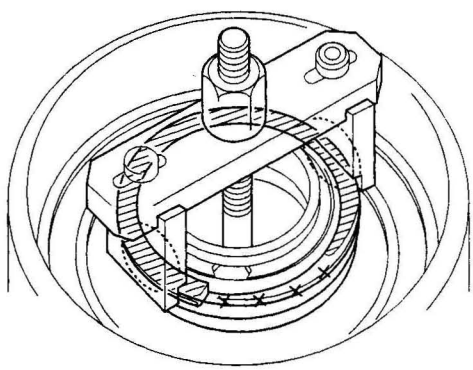
BACK

Protected by AR

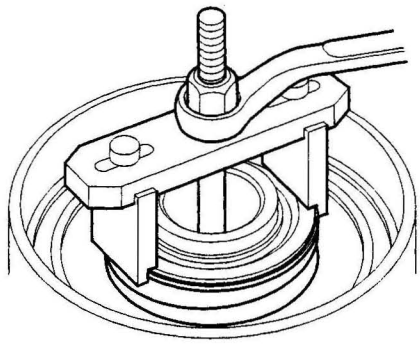
11. Set the special tool (A) on the spring retainer (B) of the 2nd and 3rd clutches so the tool works on the clutch return spring (C).



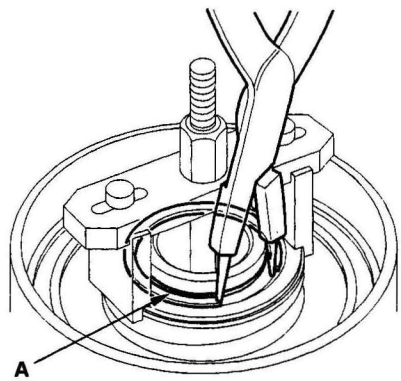
12. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



13. Compress the return spring.



14. Install the snap ring (A).



15. Remove the special tools.

(cont'd)

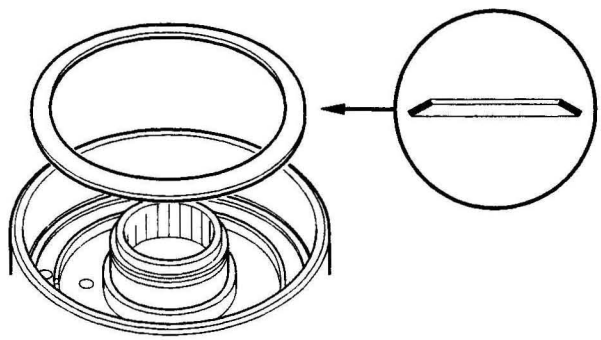
BACK

Protected by AR

Clutch Reassembly (cont'd)

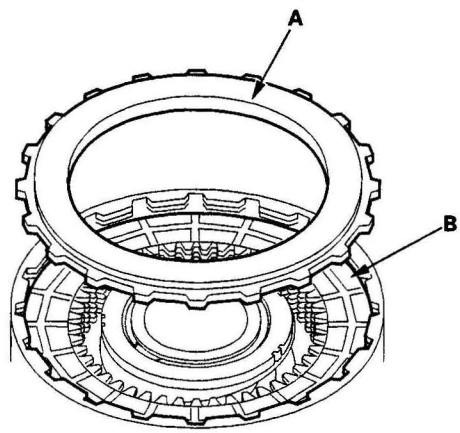
16. Install the disc spring in the 1st, 3rd, 4th, and 5th clutches in the direction shown.

    NOTE: The 2nd clutch and 1st-hold clutch do not have a disc spring.

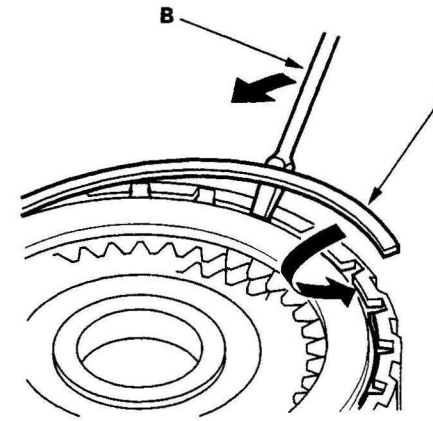


17. Make sure the inside of the clutch drum is free of dirt and other foreign particles.

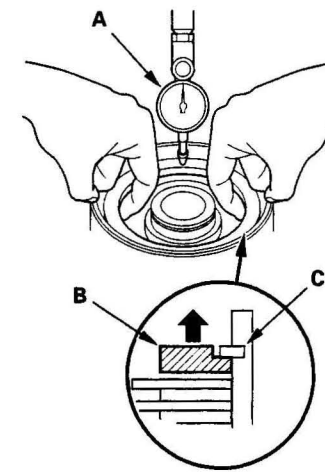
18. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate (A) with the flat side toward the disc (B).



19. Install the snap ring (A) with a screwdriver (B).



20. Set a dial indicator (A) on the clutch end plate (B).

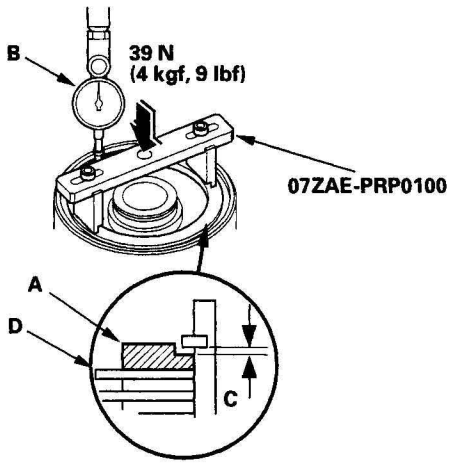


21. Zero the indicator with the clutch end plate lifted up to the snap ring (C).

BACK

Protected by AR

22. Release the clutch end plate to lower clutch end plate, then put the special tool on the end plate (A).



23. Press the special tool down with 39 N (4 kgf, 9 lbf) using a force gauge, and read the dial indicator (B). The dial indicator reads the clearance (C) between the clutch end plate and top disc (D).
Take measurements in at least three places, and use the average as the actual clearance.

Clutch End Plate-to-Top Disc Clearance:
Service Limit:
- **1st Clutch: 1.1—1.3 mm (0.043—0.051 in.)**
- **2nd Clutch:**
  - **Premium model:**
    0.7—0.9 mm (0.028—0.035 in.)
  - **Type-S model:**
    0.85—1.05 mm (0.033—0.041 in.)
- **3rd Clutch: 0.7—0.9 mm (0.028—0.035 in.)**
- **4th Clutch: 0.55—0.75 mm (0.022—0.030 in.)**
- **5th Clutch: 0.55—0.75 mm (0.022—0.030 in.)**

24. If the clearance is not within the service limit, select a new clutch end plate from the following table.

NOTE: If the thickest clutch end plate is installed, but the clearance is still over the service limit, replace the clutch discs and plates as a set.



1ST CLUTCH END PLATES

Mark	Part Number	Thickness
1	22551-P7W-003	3.1 mm (0.122 in.)
2	22552-P7W-003	3.2 mm (0.126 in.)
3	22553-P7W-003	3.3 mm (0.130 in.)
4	22554-P7W-003	3.4 mm (0.134 in.)
5	22555-P7W-003	3.5 mm (0.138 in.)
6	22556-P7W-003	3.6 mm (0.142 in.)
7	22557-P7W-003	3.7 mm (0.146 in.)
8	22558-P7W-003	3.8 mm (0.150 in.)
9	22559-P7W-003	3.9 mm (0.154 in.)

2ND CLUTCH END PLATES

Mark	Part Number	Thickness
1	22551-PY4-003	2.1 mm (0.083 in.)
2	22552-PY4-003	2.2 mm (0.087 in.)
3	22553-PY4-003	2.3 mm (0.091 in.)
4	22554-PY4-003	2.4 mm (0.094 in.)
5	22555-PY4-003	2.5 mm (0.098 in.)
6	22556-PY4-003	2.6 mm (0.102 in.)
7	22557-PY4-003	2.7 mm (0.106 in.)
8	22558-PY4-003	2.8 mm (0.110 in.)
9	22559-PY4-003	2.9 mm (0.114 in.)

3RD CLUTCH END PLATES

Mark	Part Number	Thickness
1	22551-PX4-003	2.1 mm (0.083 in.)
2	22552-PX4-003	2.2 mm (0.087 in.)
3	22553-PX4-003	2.3 mm (0.091 in.)
4	22554-PX4-003	2.4 mm (0.094 in.)
5	22555-PX4-003	2.5 mm (0.098 in.)
6	22556-PX4-003	2.6 mm (0.102 in.)
7	22557-PX4-003	2.7 mm (0.106 in.)
8	22558-PX4-003	2.8 mm (0.110 in.)
9	22559-PX4-003	2.9 mm (0.114 in.)

4TH and 5TH CLUTCH END PLATES

Mark	Part Number	Thickness
1	22561-P7T-003	2.1 mm (0.083 in.)
2	22562-P7T-003	2.2 mm (0.087 in.)
3	22563-P7T-003	2.3 mm (0.091 in.)
4	22564-P7T-003	2.4 mm (0.094 in.)
5	22565-P7T-003	2.5 mm (0.098 in.)
6	22566-P7T-003	2.6 mm (0.102 in.)
7	22567-P7T-003	2.7 mm (0.106 in.)
8	22568-P7T-003	2.8 mm (0.110 in.)
9	22569-P7T-003	2.9 mm (0.114 in.)

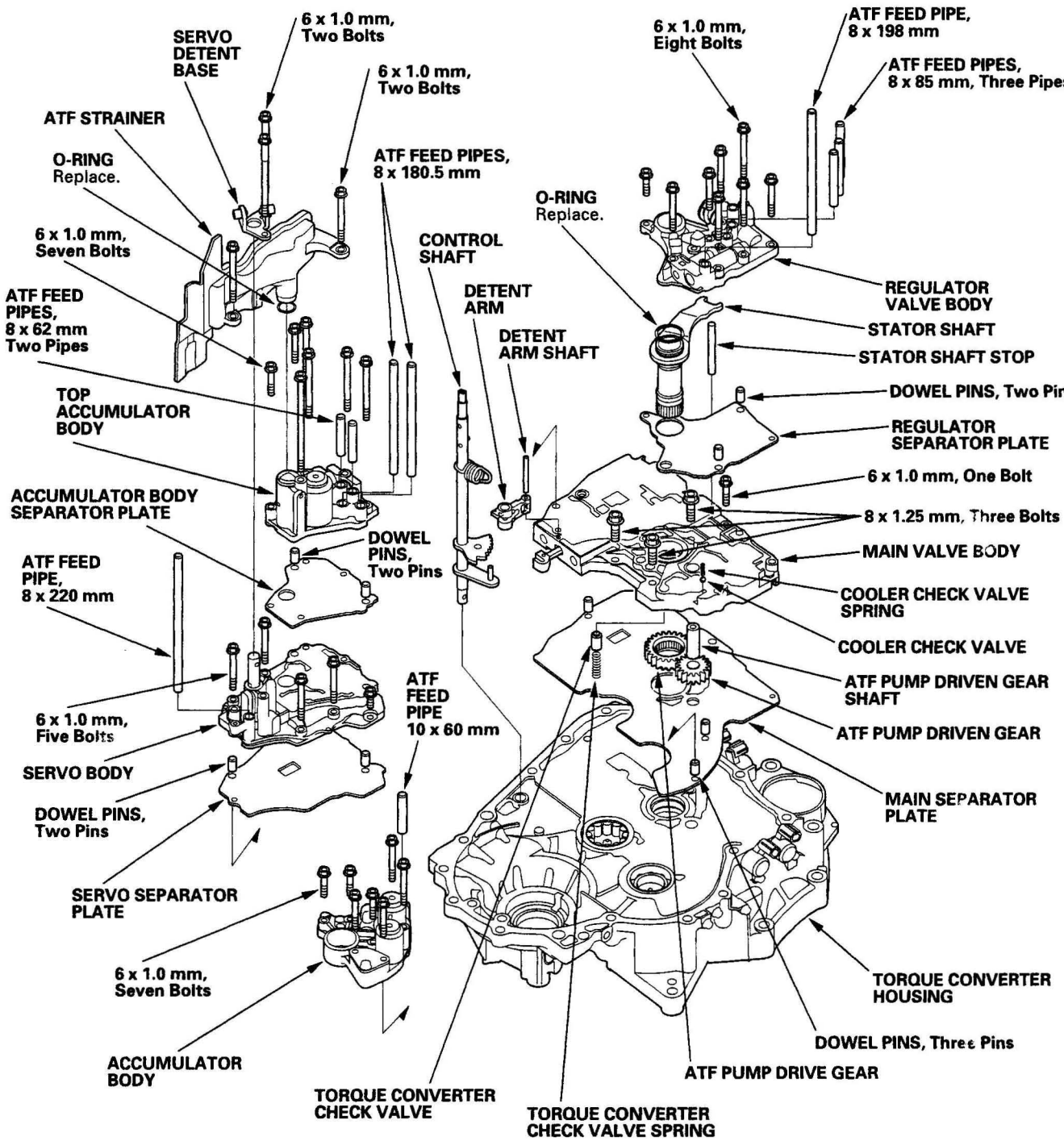
BACK

Protected by AR

Valve Bodies and ATF Strainer Installation

Exploded View

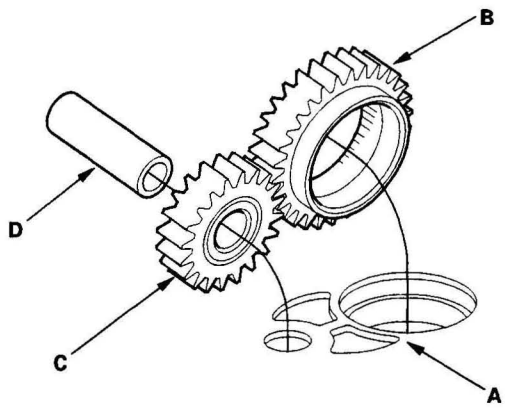
Bolt Tightening torque: 6 x 1.0 mm: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)
8 x 1.25 mm: 18 N·m (1.8 kgf·m, 13 lbf·ft)



BACK

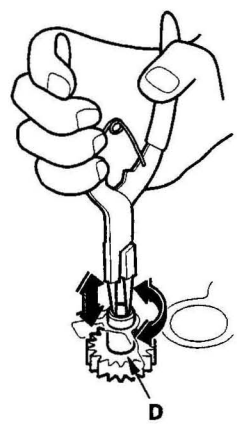
Protected by AR

1. Install the main separator plate (A) and three dowel pins on the torque converter housing. Then install the ATF pump drive gear (B), driven gear (C), and ATF pump driven gear shaft (D). Install the ATF pump driven gear with its grooved and chamfered side facing down.



2. Install the main valve body (one 6 mm bolt and three 8 mm bolts). Make sure the ATF pump drive gear (B) rotates smoothly in the normal operating direction, and the ATF pump driven gear shaft (D) moves smoothly in the axial and normal operating direction.





3. If the ATF pump drive gear and ATF pump driven gear shaft do not move smoothly, loosen the main valve body bolts. Realign the ATF pump driven gear shaft, and retighten the bolts to the specified torque, then recheck. Failure to align the ATF pump driven gear shaft correctly will result in a seized ATF pump drive gear or ATF pump driven gear shaft.

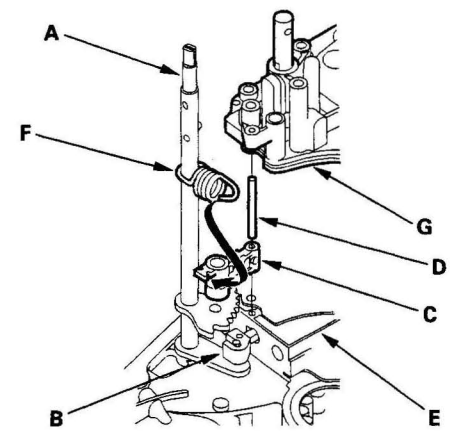
4. Install the torque converter check valve and spring, and the cooler check valve and spring on the main valve body, then install the two dowel pins and the regulator separator plate.

5. Install the stator shaft and stator shaft stop.

6. Install the regulator valve body (eight bolts).

7. Install the two dowel pins and the servo separator plate on the main valve body.

8. Install the control shaft (A) in the torque converter housing along with the manual valve (B).



9. Install the detent arm (C) and arm shaft (D) in the main valve body (E), then hook the detent arm spring (F) to the detent arm.

10. Install the servo body (G) (five bolts).

11. Install the top accumulator body separator plate with two dowel pins on the servo body, then install the top accumulator body (seven bolts).

12. Install the ATF strainer (two bolts).

13. Install the servo detent base (two bolts).

14. Install the accumulator body (seven bolts).

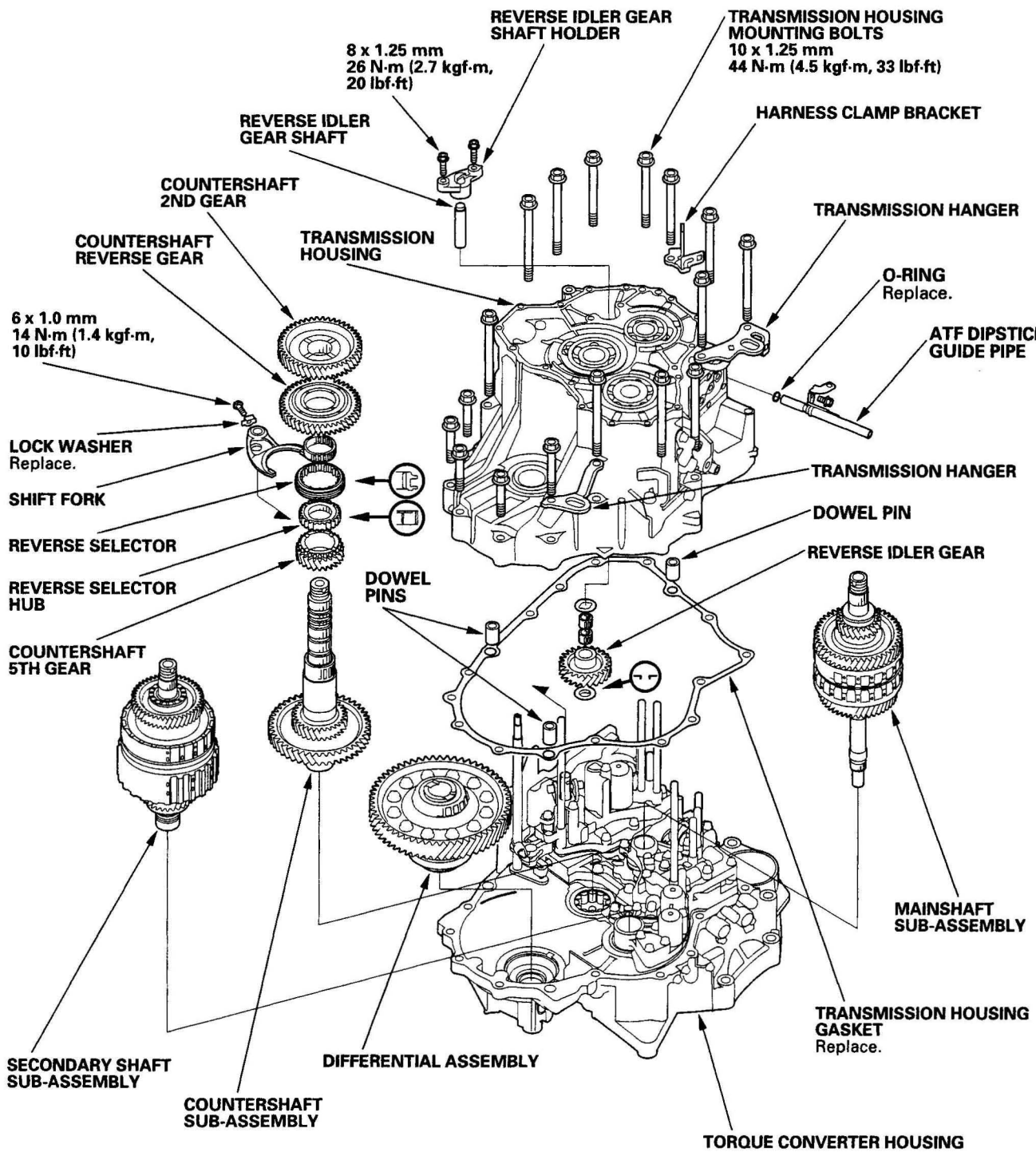
15. Install the one ATF feed pipe in the servo body, four pipes in the regulator valve body, four pipes in the top accumulator body, and one pipe in the accumulator body.

BACK

Protected by AR

Shaft Assemblies and Housing Installation

Exploded View

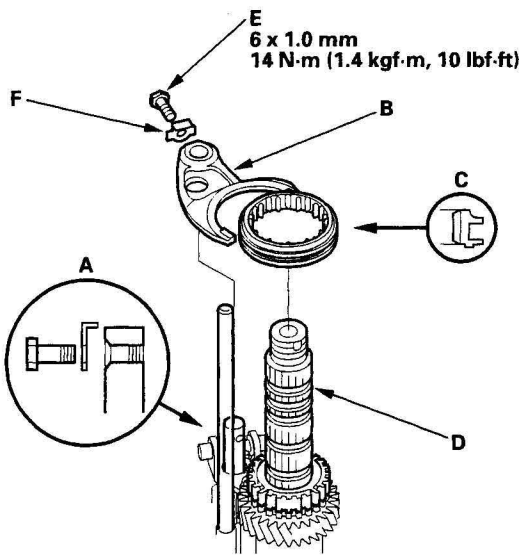


BACK

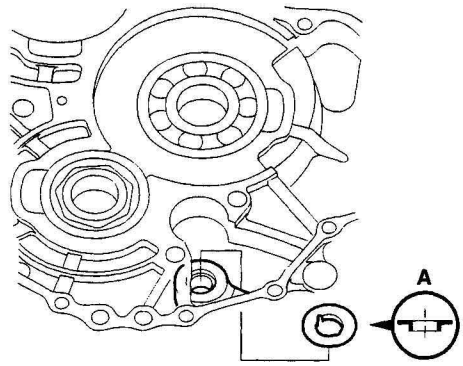
Protected by AR

NOTE: Refer to the Exploded View as needed during the following procedure.

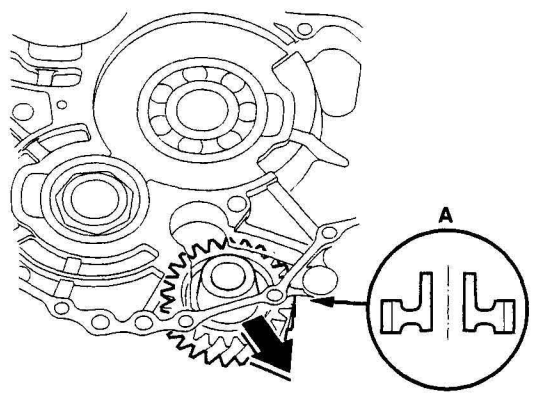
1. Install the differential assembly in the torque converter housing.
2. If the reverse selector hub is press-fitted type, join the mainshaft, countershaft, and secondary shaft together, then install them in the torque converter housing.
3. If the reverse selector hub is not press-fitted type, install the countershaft, mainshaft, and secondary shaft in the torque converter housing, then install the countershaft 5th gear and reverse selector hub on the countershaft.
4. Turn the shift fork shaft (A) so the large chamfered hole is facing the fork bolt hole. Then install the shift fork (B) and reverse selector (C) together on the shift fork shaft and countershaft (D). Secure the shift fork to the shift fork shaft with the lock bolt (E) and a new lock washer (F), then bend the lock washer against the bolt head.



5. Install the needle bearing, countershaft reverse gear, and countershaft 2nd gear on the countershaft.
6. Place the thrust washer (A) in the transmission housing.



7. Place the reverse idler gear (A) in the transmission housing as shown, then slide it in the direction shown.



(cont'd)

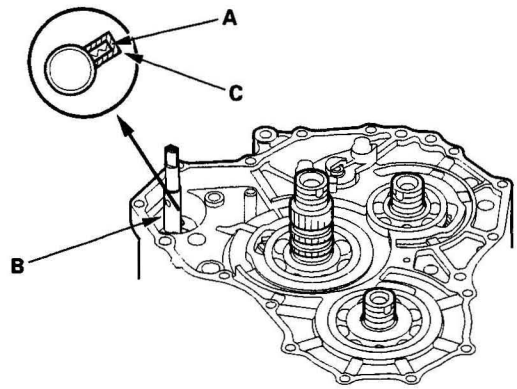
BACK

Protected by AR

Shaft Assemblies and Housing Installation (cont'd)

8. Align the spring pin (A) on the control shaft (B) with the transmission housing groove (C) by turning the control shaft.

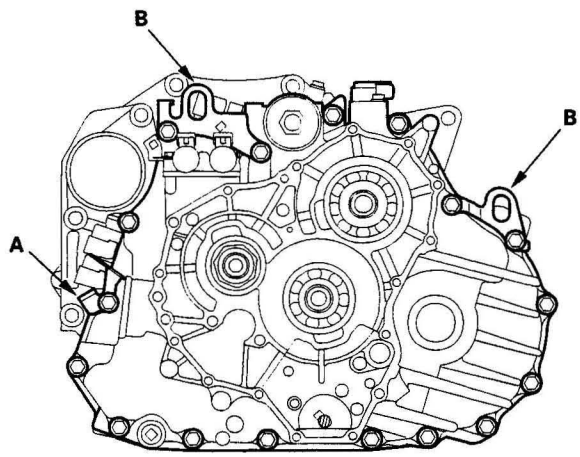
   NOTE: Be careful not to squeeze the end of the control shaft tips together. If the tips are squeezed together it will cause a faulty shift signal or position due to the play between the control shaft and the transmission range switch.



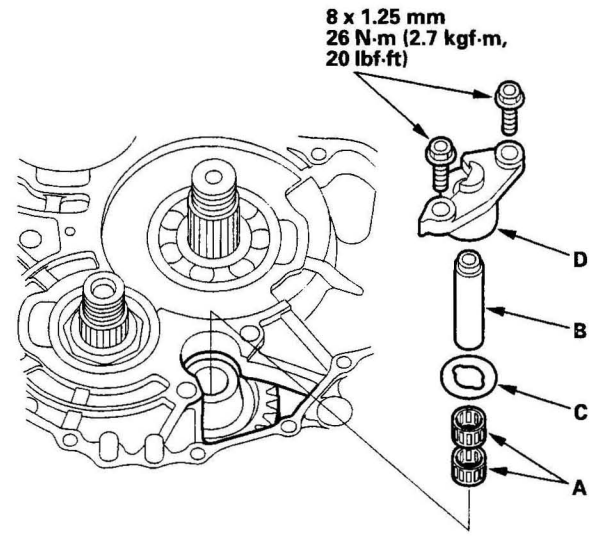
9. Install three dowel pins and a new gasket on the torque converter housing.

10. Place the transmission housing on the torque converter housing, then install the transmission housing mounting bolts along with the harness clamp bracket (A) and transmission hangers (B). Tighten the bolts in a crisscross pattern in two or more steps.

    TORQUE: 44N·m (4.5 kgf·m, 33 lbf·ft)



11. Engage the reverse idler gear with the countershaft reverse gear and the mainshaft reverse gear. Then install the needle bearings (A), reverse idler gear shaft (B), and thrust washer (C) in the reverse idler gear, and install the reverse idler gear shaft holder (D) on the transmission housing.



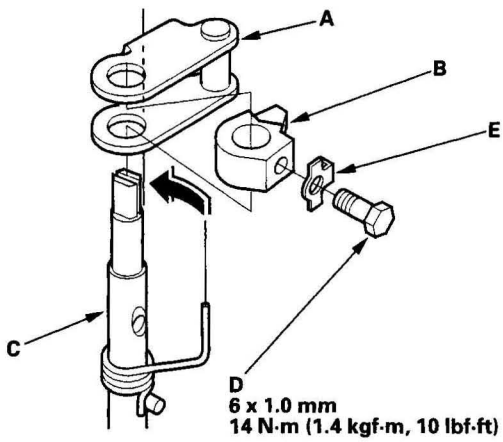
BACK

Protected by AR

End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Installation

Special Tools Required
- Mainshaft holder
  07GAB-PF50101 or 07GAB-PF50100
- Adjustable bearing puller, 25 – 40 mm
  07736-A01000B or 07736-A01000A

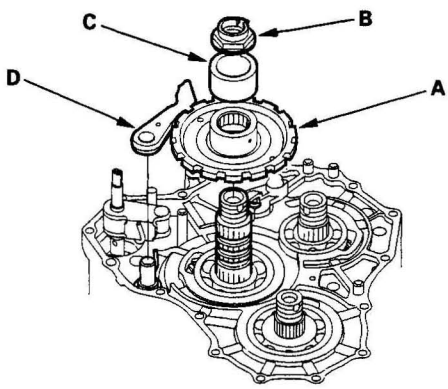
1. Install the park lever (A) and park lever stop (B), on the control shaft (C), then install the lock bolt (D) with a new lock washer (E). Do not bend the lock tab of the lock washer until step 28.



2. Lubricate the following parts with ATF:
   - Splines of the countershaft, the park gear, and the old locknut.
   - Threads of the countershaft and the old locknut.
   - Old conical spring washer.

3. Install the park gear (A) using the old locknut (B) and a collar (C). Hold the park pawl (D) against the park gear, then tighten the old locknut until the shaft splines come out over the park gear splines.

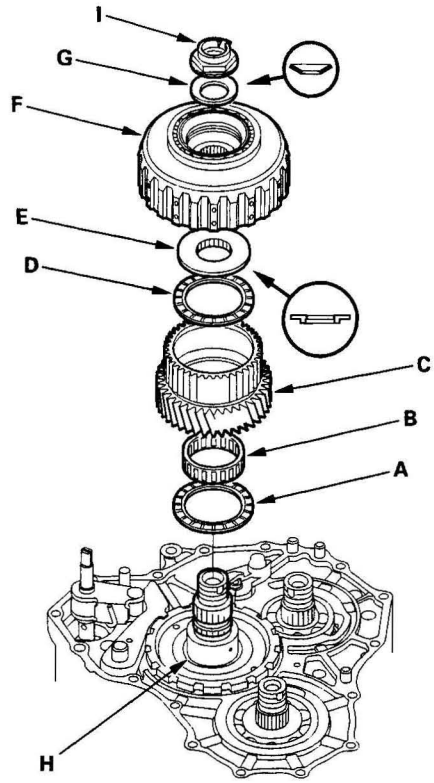
   NOTE:
   - Do not use an impact wrench.
   - Countershaft locknut has left-hand threads.



4. Remove the locknut and collar.

5. Install the thrust needle bearing (A), needle bearing (B), 3rd gear (C), thrust needle bearing (D), 31 x 63.5 mm splined washer (E), 3rd clutch assembly (F), and old conical spring washer (G) on the countershaft (H). Tighten the old locknut (I) to 226 N·m (23.0 kgf·m, 166 lbf·ft).

   NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.



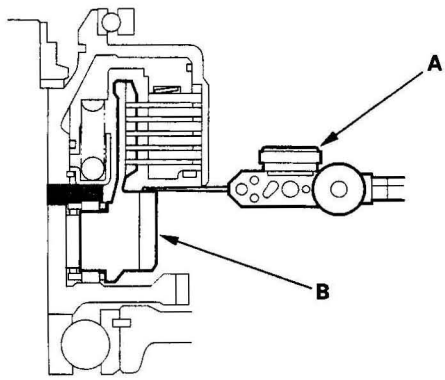
(cont'd)

BACK

Protected by AR

End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Installation (cont'd)

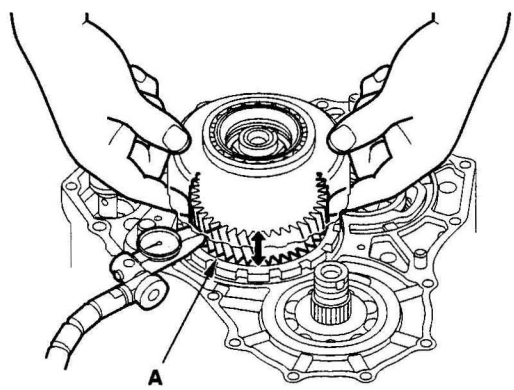
6. Set the dial indicator (A) to the countershaft 3rd gear (B).



7. Measure the countershaft 3rd gear axial clearance in at least three places, while moving the countershaft 3rd gear (A).
   Use the average as the actual clearance.

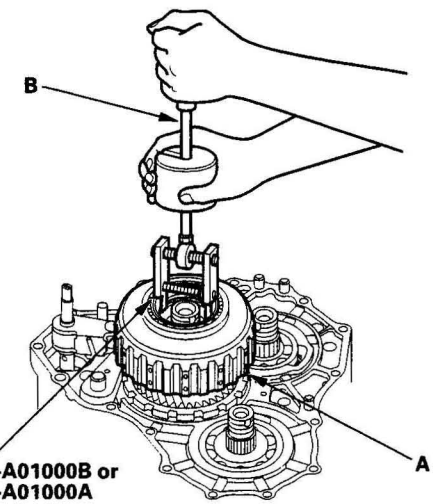
   If the clearance is out of standard, select the appropriate 31 x 63.5 mm splined washer in step 16.

   STANDARD: 0.015 – 0.045 mm (0.0006 – 0.0018 in.)



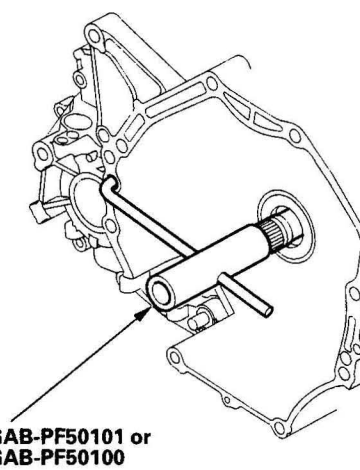
8. Remove the locknut and conical spring washer.

9. Remove the 3rd clutch assembly (A) with the special tool and a commercially available 3/8-16" slide hammer (B).



10. Remove the parts that were installed in step 5.

11. Install the special tool onto the mainshaft.



BACK

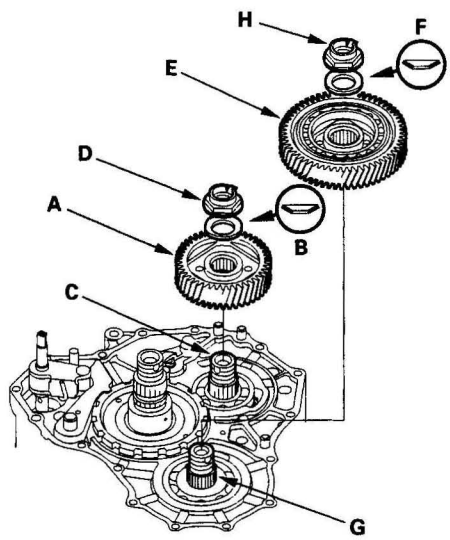
Protected by AR

12. Lubricate the following parts with ATF:

    - Splines of the mainshaft 3rd gear and secondary shaft idler gear.
    - Threads of the mainshaft and secondary shaft.
    - Threads of the old mainshaft and secondary shaft locknuts.
    - Old conical spring washer.

13. Install the mainshaft 3rd gear (A) and the old conical spring washer (B) on the mainshaft (C). Tighten the old locknut (D) to seat the 3rd gear to 226 N·m (23.0 kgf·m, 166 lbf·ft).

    NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.

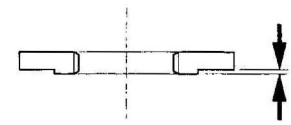


14. Install the secondary shaft idler gear (E) and the old conical spring washer (F) on the secondary shaft (G). Tighten the old locknut (H) to seat the secondary shaft idler gear to 226 N·m (23.0 kgf·m, 166 lbf·ft).

    NOTE:
    - Use a torque wrench to tighten the locknut. Do not use an impact wrench.
    - Secondary shaft locknut has left-hand threads.

15. Remove the old locknuts and old conical spring washers from the mainshaft and secondary shaft.

16. If the 3rd gear axial clearance is out of standard (measured in step 7), measure the difference of the 31 x 63.5 mm splined washer, and select the appropriate splined washer from the table below.



SPLINED WASHER, 31 x 63.5 mm

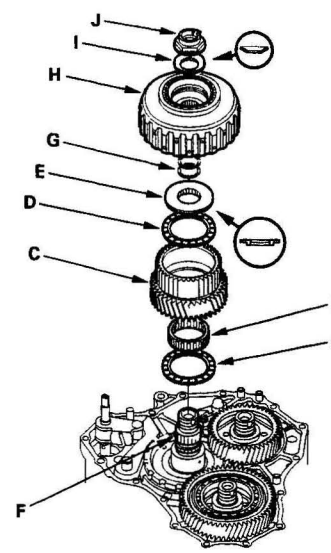
Mark	Part Number	Difference
A	90520-P7W-000	3.503 mm (0.1379 in.)
B	90521-P7W-000	3.490 mm (0.1374 in.)
C	90522-P7W-000	3.477 mm (0.1369 in.)
D	90523-P7W-000	3.464 mm (0.1364 in.)

17. Install the thrust needle bearing (A), needle bearing (B), 3rd gear (C), thrust needle bearing (D), and 31 x 63.5 mm splined washer (E) on the countershaft (F).

18. Wrap the shaft splines with tape to prevent O-ring damage, then install new O-rings (G).

19. Remove the tape, then install the 3rd clutch assembly (H), and old conical spring washer (I). Tighten the old locknut (J) to 226 N·m (23.0 kgf·m, 166 lbf·ft).

    NOTE: Use a torque wrench to tighten the locknut. Do not use an impact wrench.



(cont'd)

BACK

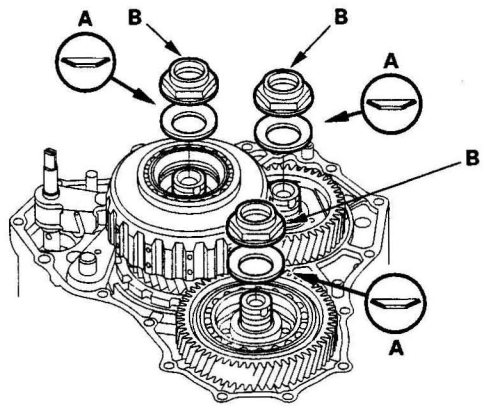
Protected by AR

End Cover, 3rd Gears, Idler Gear, and 3rd Clutch Installation (cont'd)

20. Remove the old locknut and old conical spring washer from the countershaft.

21. Lubricate the threads of each shaft, the new locknuts, and new conical spring washers with ATF.

22. Install the new conical spring washers (A) in the direction shown, and install the new locknuts (B).

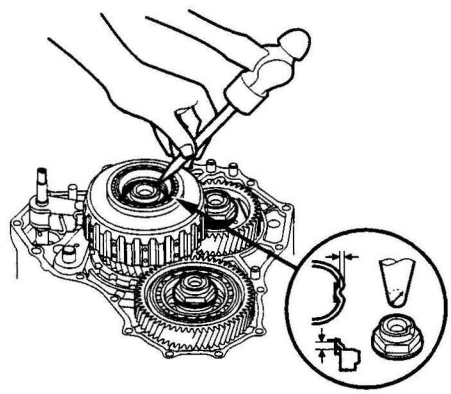


23. Tighten the locknuts to 167 N·m (17.0 kgf·m, 123 lbf·ft).

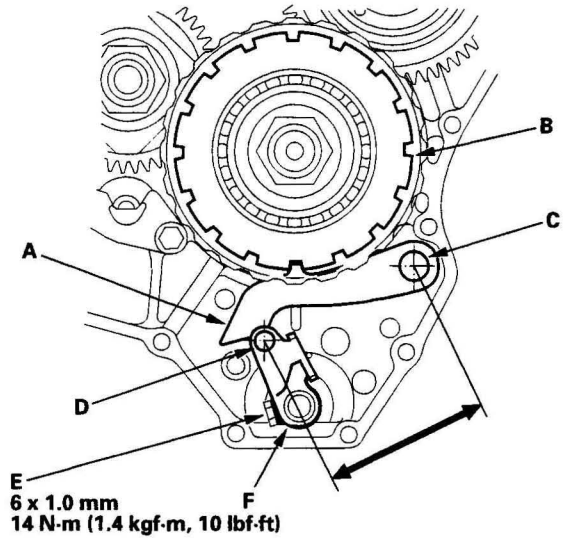
    NOTE:
    - Use a torque wrench to tighten the locknuts. Do not use an impact wrench.
    - Countershaft and secondary shaft locknuts have left-hand threads.

24. Remove the special tool from the mainshaft.

25. Stake each locknut into its shaft using a 3.5 mm punch.



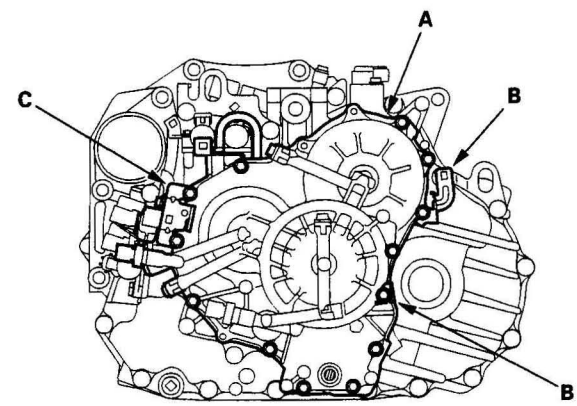
26. Set the park lever in the [P] position, then verify that the park pawl (A) engages the park gear (B).



27. If the park pawl does not engage fully, check the distance between the pawl shaft (C) and the park lever roller pin (D) (see page 14-401).

28. Tighten the lock bolt (E), and bend the lock tab of the lock washer (F) against the lock bolt head.

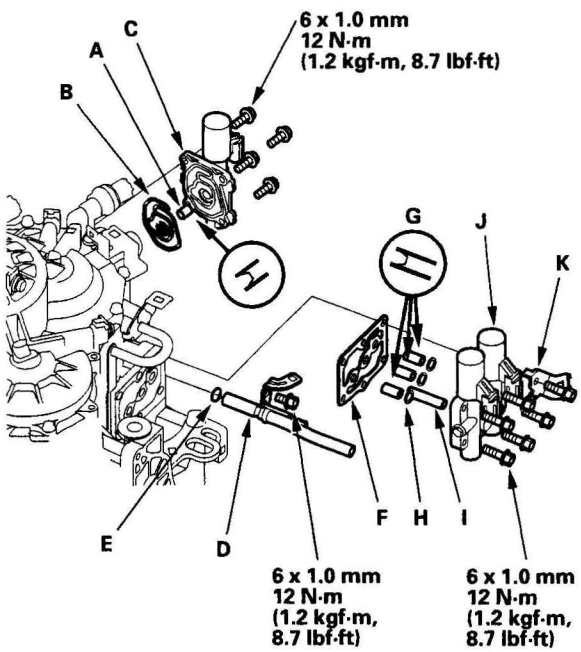
29. Install the end cover (A) with the two dowel pins, new O-rings, new gasket, harness clamp bracket (B), and connector bracket (C). Tighten the 13 bolts to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).



BACK

Protected by AR

30. Install the 8 x 12 mm ATF feed pipe (A) with its filter side into the transmission housing.



31. Install the new gasket (B) in the mounting groove of the A/T clutch pressure control solenoid valve C body (C) properly, then install them on the transmission housing. Do not pinch the gasket.

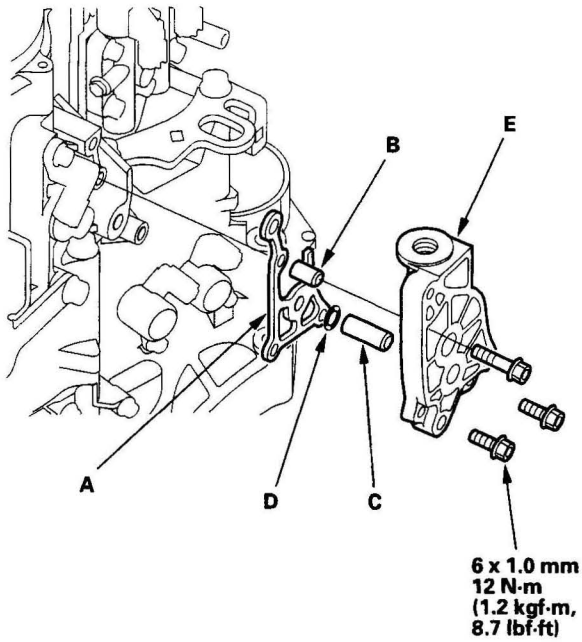
32. Install the ATF dipstick guide pipe (D) with the new O-ring (E).

33. Place the new gasket (F) on the transmission housing, then install the 8 x 18 mm ATF feed pipes (G) with their filter side into the transmission housing.

34. Install the new O-rings (H) over the feed pipes, and install the 8 x 40 mm ATF feed pipe (I).

35. Install the A/T clutch pressure control solenoid valves A and B (J) and the harness clamp bracket (K).

36. Place the new ATF passage body gasket (A) on the transmission housing, then install the 8 x 14 mm dowel pin (B) and the 10 x 25.5 mm ATF feed pipe (C) with the new O-ring (D). Install the ATF passage body (E) on the transmission housing, if it was removed.



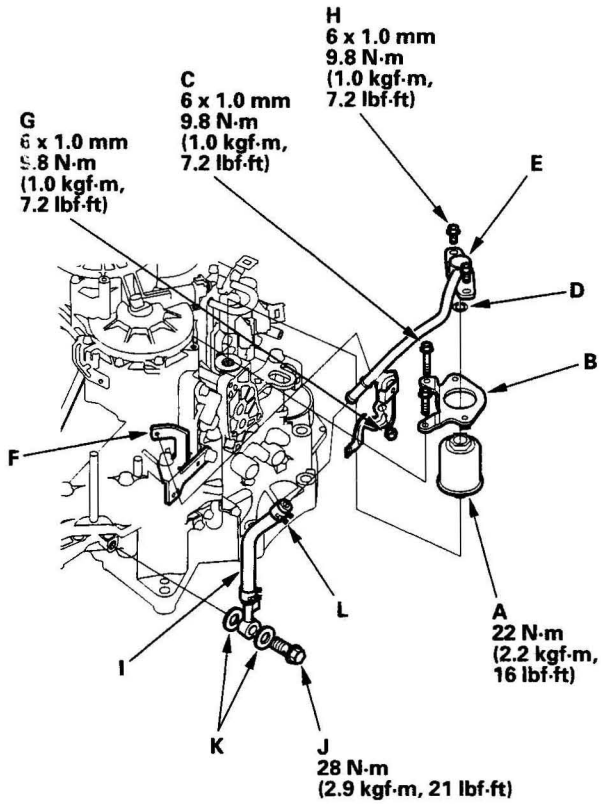
(cont'd)

BACK

Protected by AR

End Cover, 3rd Gears, Idle Gear, and 3rd Clutch Installation (cont'd)

37. Install the new ATF filter (A) on the transmission housing.



38. Install the filter line bracket (B) on the ATF filter, and loosely install the bolts (C).

39. Install the new O-ring (D) to the filter line (E), then install the filter line on the ATF filter.

40. Secure the end of the filter line on the bracket (F) with the bolt (G).

41. Secure the filter line on the filter line bracket with the bolts (H).

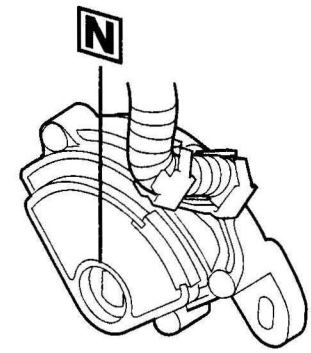
42. Tighten the bolts (C) on the filter line bracket to the specified torque.

43. Install the ATF hose (I) and line bolt (J) with the new sealing washers (K).

44. Connect the hose to the filter line, and secure it with the clip (L).

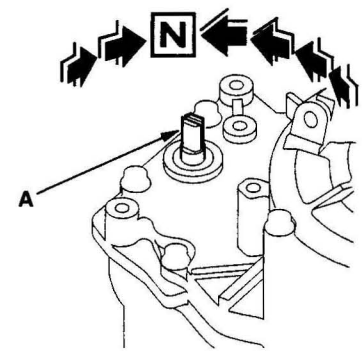
45. Set the transmission range switch to the [N] position.

NOTE: The transmission range switch clicks in the [N] position.



46. Set the control shaft (A) to the [N] position by turning it.

NOTE: Be careful not to squeeze the end of the control shaft tips together. If the tips are squeezed together it will cause a faulty shift signal or position due to the play between the control shaft and the switch.

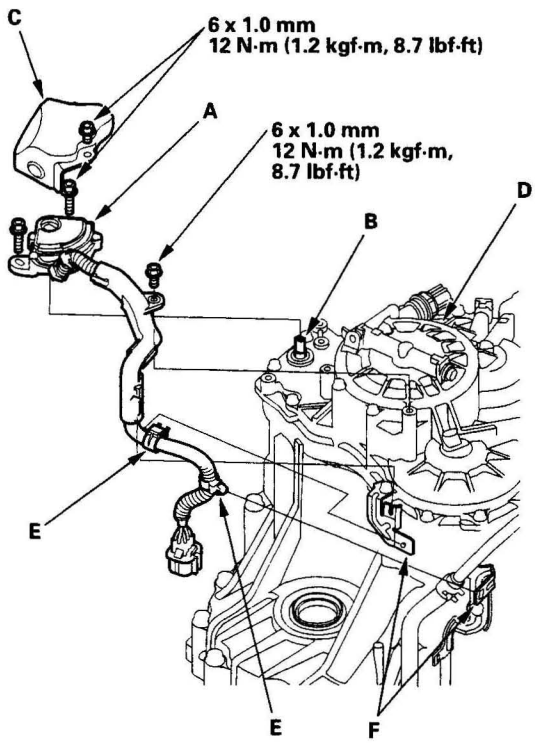


BACK

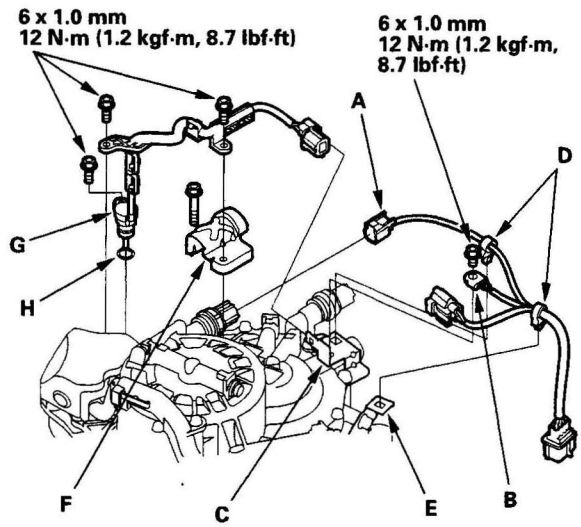
Protected by AR

47. Install the transmission range switch (A) gently on the control shaft (B). Take care not to move the transmission range switch when tightening its bolts.

48. Install the transmission range switch cover (C); secure the harness with the bolt on the end cover (D); install the harness clamps (E) on the clamp brackets (F).



49. Connect the 3rd clutch pressure switch connector (A) and A/T wire harness ground terminal (B) on the connector bracket (C), then install the clamps (D) on the clamp bracket (E).



50. Install the switch cover (F).

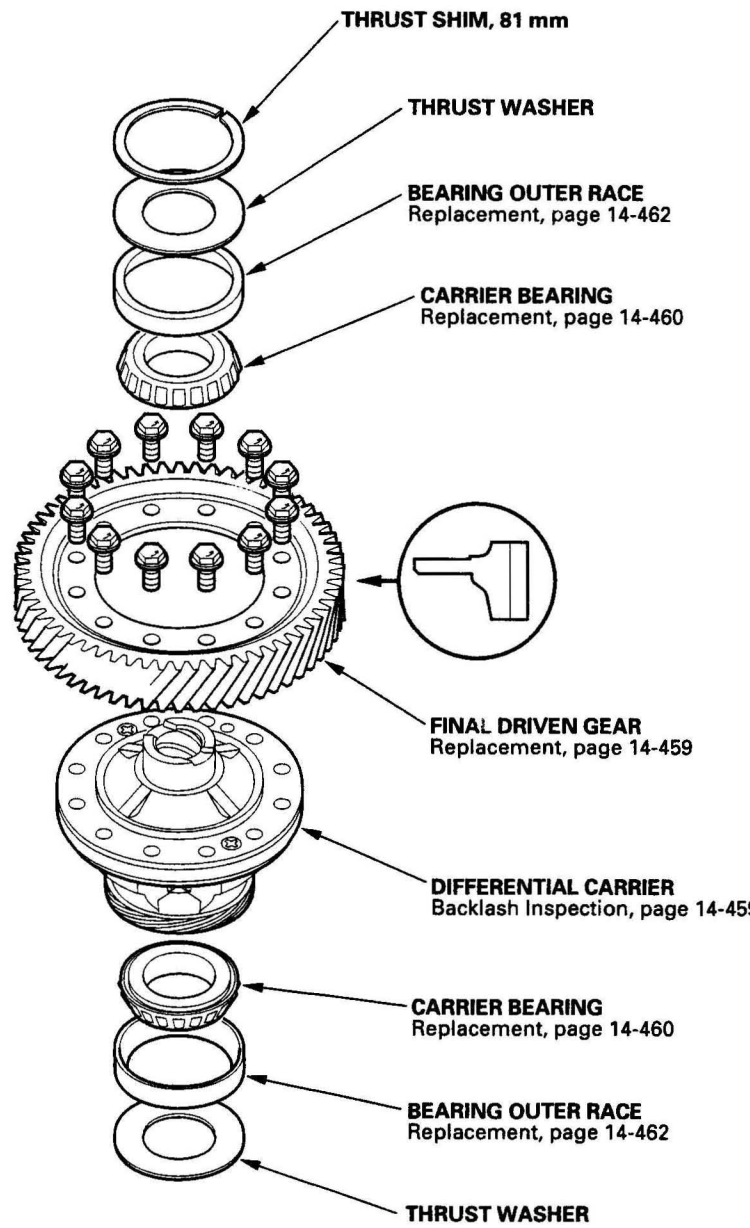
51. Install the ATF temperature sensor (G) with the new O-ring (H), then secure the harness with the bolts. Connect the sensor connector to the A/T wire harness connector, then install it on the connector bracket (C).

52. Install the dipstick.

BACK

Protected by AR

Component Location Index

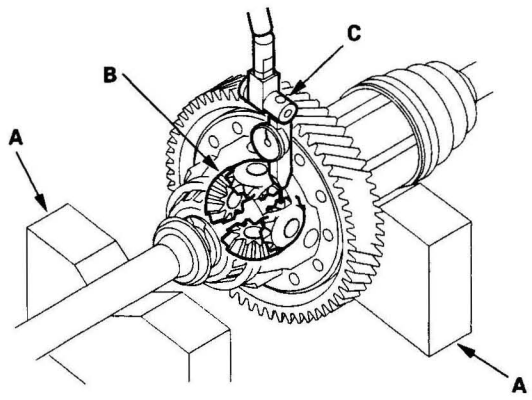


BACK

Protected by AR

Backlash Inspection

1. Install both axles, and place the differential assembly on V-blocks (A).



2. Check the backlash of the pinion gears (B) with a dial indicator (C).

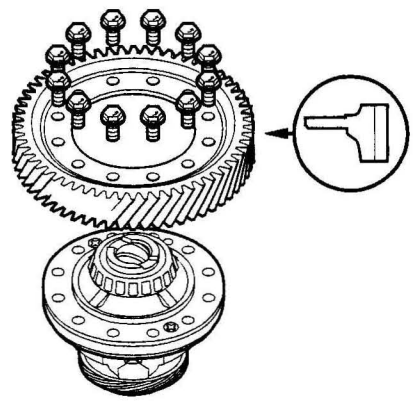
   STANDARD: 0.175 – 0.275 mm (0.007 – 0.011 in.)

3. If the backlash is out of standard, replace the differential carrier.

Final Driven Gear/Carrier Replacement

1. Remove the final driven gear from the differential carrier.

   NOTE: The final driven gear bolts have left-hand threads.



2. Install the final driven gear with the chamfered side on the inner bore facing the differential carrier.

3. Tighten the bolts to the specified torque in a crisscross pattern.

   TORQUE: 101 N·m (10.3 kgf·m, 74.5 lbf·ft)

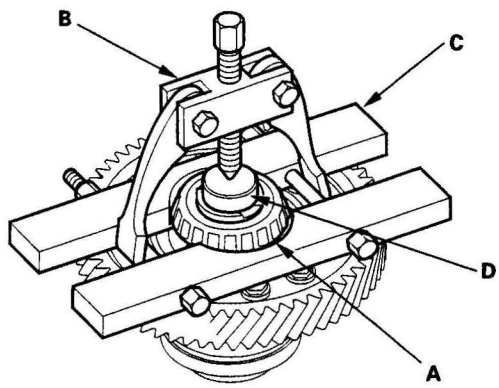
Protected by AR

Carrier Bearing Replacement

Special Tools Required
Attachment, 40 x 50 mm 07LAD-PW50601

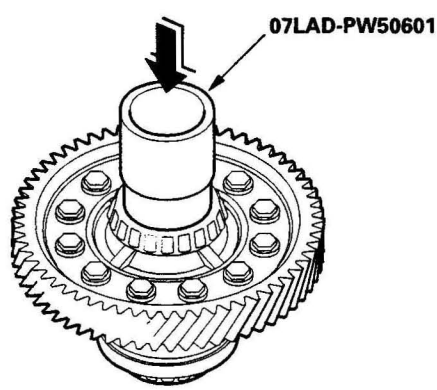
NOTE:
- The bearing and outer race should be replaced as a set.
- Inspect and adjust the bearing preload whenever bearing is replaced.
- Check the bearing for wear and rough rotation. If the bearing is OK, removal is not necessary.

1. Remove the carrier bearing (A) with a commercially available bearing puller (B), bearing separator (C), and stepped adapter (D).



2. Install the new carrier bearings with the special tool and a press.

   NOTE:
   - Press the bearing on until it bottom.
   - Use the small end of the special tool to install the bearing.
   - Press the bearing on securely so there is no clearance between the bearing and the differential carrier.



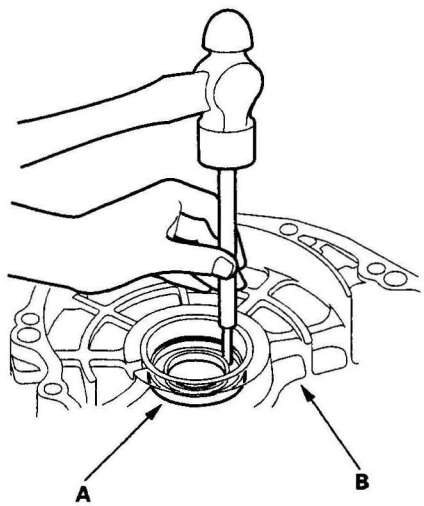
BACK

Protected by AR

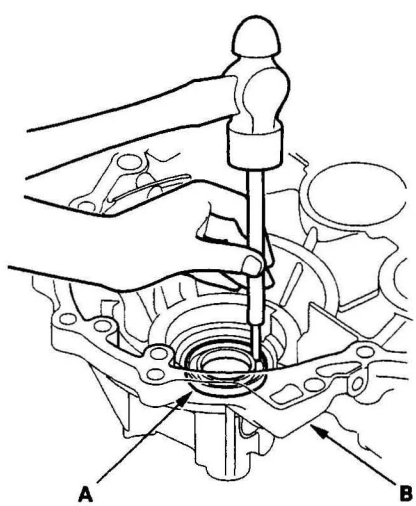
Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Seal driver attachment 07GAD-PG40101 or 07GAD-PG40100
- Oil seal driver attachment 07JAD-PH80101

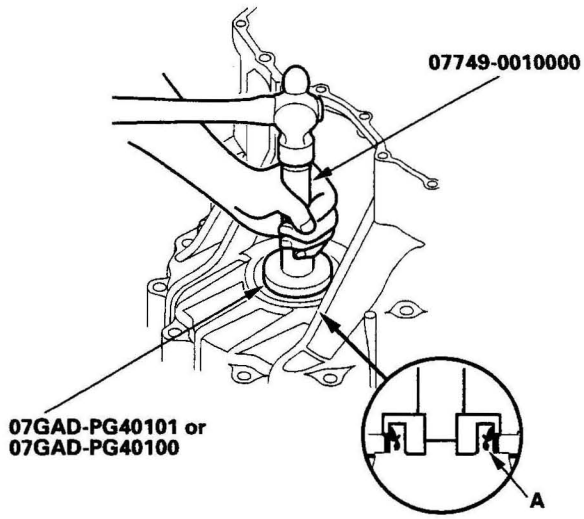
1. Remove the differential assembly.
2. Remove the oil seal (A) from the transmission housing (B).



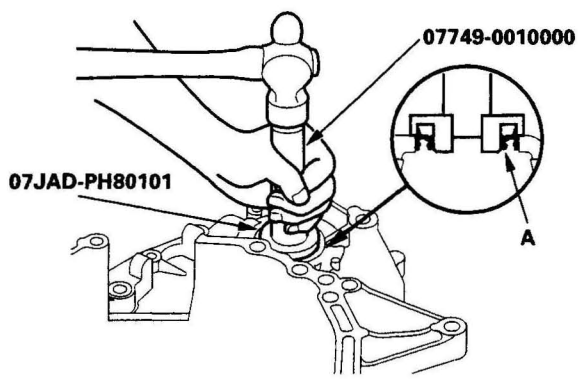
3. Remove the oil seal (A) from the torque converter housing (B).



4. Install the oil seal (A) in the transmission housing with the special tools.



5. Install the oil seal (A) in the torque converter housing with the special tools.



BACK

Protected by AR

Carrier Bearing Outer Race Replacement

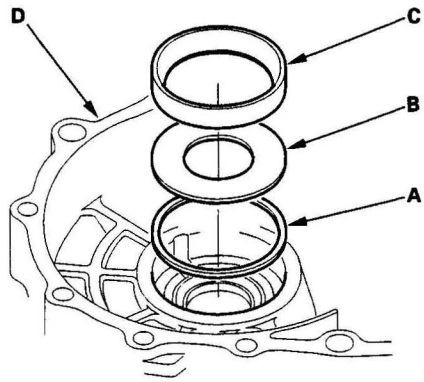
Special Tools Required
- Driver 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100

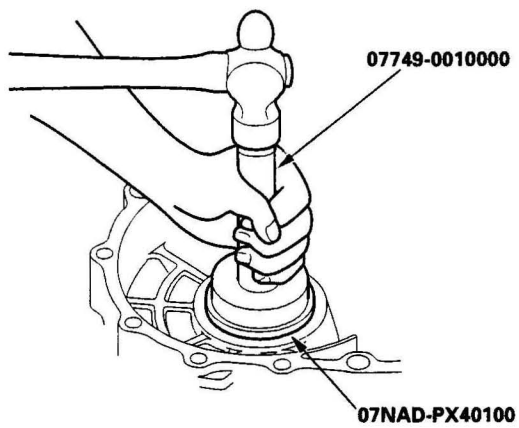
NOTE:
- Replace the bearing with a new one whenever the outer race is replaced.
- Do not use shim(s) on the torque converter housing side.
- Adjust preload after replacing the bearing and outer race.
- Coat all parts with ATF during installation.

1. Remove the bearing outer race from the transmission housing by heating the housing to about 212°F (100°C) with a heat gun. Do not heat the housing to more than 212°F (100°C).

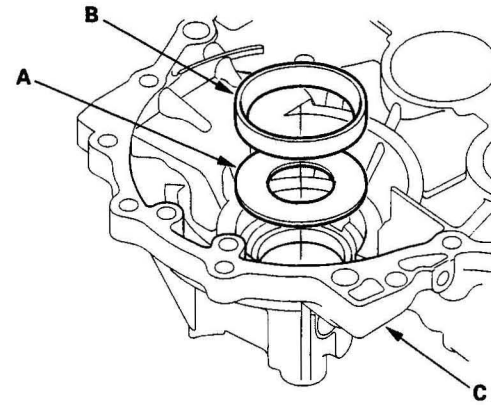
2. Remove the bearing outer race from the torque converter housing.

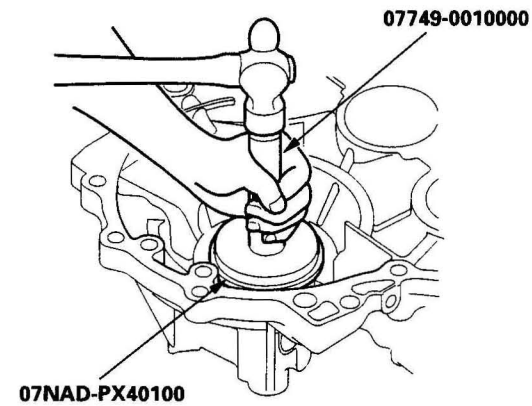
3. Install the thrust shim (A), thrust washer (B), and outer race (C) in the transmission housing (D) with the special tools.





4. Install the thrust washer (A) and outer race (B) in the torque converter housing (C), and use the special tools to make sure the outer race bottoms out in the housing.





BACK

Protected by AR

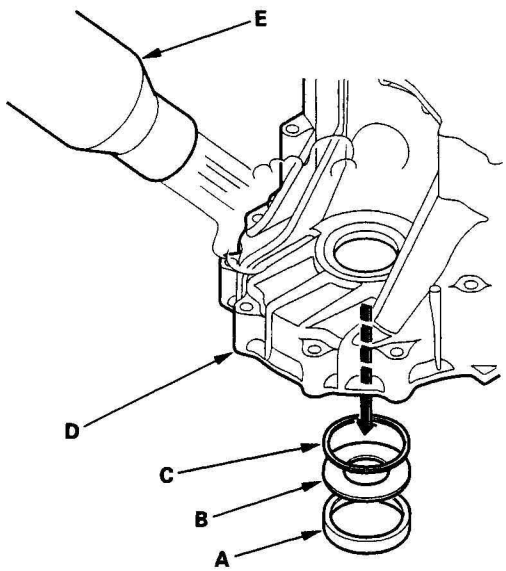
Carrier Bearing Preload Inspection

Special Tools Required
- Driver 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100
- Preload inspection tool 07XAJ-S0K0100

NOTE: If the transmission housing, torque converter housing, differential carrier, tapered roller bearing, outer race, or thrust shim were replaced, the bearing preload must be adjusted.

1. Remove the bearing outer race (A), thrust washer (B), and thrust shim (C) from the transmission housing (D) by heating the housing to about 212°F (100°C) with a heat gun (E). Do not heat the housing in excess of 212°F (100°C).

   NOTE: Let the transmission housing cool to room temperature before adjusting the bearing preload.



2. Replace the tapered roller bearing when the outer race is to be replaced.

3. Do not use a shim on the torque converter housing side.

4. Select the 2.60 mm (0.102 in.) thrust shim from the table below.

THRUST SHIM, 81 mm

No.	Part Number	Thickness
A	41438-P7T-700	2.05 mm (0.081 in.)
AA	41438-PGH-000	2.075 mm (0.082 in.)
B	41439-P7T-700	2.10 mm (0.083 in.)
BB	41439-PGH-000	2.125 mm (0.084 in.)
C	41440-P7T-700	2.15 mm (0.085 in.)
CC	41440-PGH-000	2.175 mm (0.086 in.)
D	41441-P7T-000	2.20 mm (0.087 in.)
DD	41441-PGH-000	2.225 mm (0.088 in.)
E	41442-P7T-000	2.25 mm (0.089 in.)
EE	41442-PGH-000	2.275 mm (0.090 in.)
F	41443-P7T-000	2.30 mm (0.091 in.)
FF	41443-PGH-000	2.325 mm (0.092 in.)
G	41444-P7T-000	2.35 mm (0.093 in.)
GG	41444-PGH-000	2.375 mm (0.094 in.)
H	41445-P7T-000	2.40 mm (0.094 in.)
HH	41445-PGH-000	2.425 mm (0.095 in.)
I	41446-P7T-000	2.45 mm (0.096 in.)
II	41446-PGH-000	2.475 mm (0.097 in.)
J	41447-P7T-000	2.50 mm (0.098 in.)
JJ	41447-PGH-000	2.525 mm (0.099 in.)
K	41448-P7T-000	2.55 mm (0.100 in.)
KK	41448-PGH-000	2.575 mm (0.101 in.)
L	41449-P7T-000	2.60 mm (0.102 in.)
LL	41449-PGH-000	2.625 mm (0.103 in.)
M	41450-P7T-000	2.65 mm (0.104 in.)
MM	41450-PGH-000	2.675 mm (0.105 in.)
N	41451-P7T-000	2.70 mm (0.106 in.)
NN	41451-PGH-000	2.725 mm (0.107 in.)
O	41452-P7T-000	2.75 mm (0.108 in.)
OO	41452-PGH-000	2.775 mm (0.109 in.)
P	41453-P7T-000	2.80 mm (0.110 in.)
PP	41453-PGH-000	2.825 mm (0.111 in.)
Q	41454-P7T-000	2.85 mm (0.112 in.)
QQ	41454-PGH-000	2.875 mm (0.113 in.)
R	41455-P7T-000	2.90 mm (0.114 in.)
RR	41455-PGH-000	2.925 mm (0.115 in.)
S	41456-P7T-000	2.95 mm (0.116 in.)
SS	41456-PGH-000	2.975 mm (0.117 in.)
T	41457-P7T-000	3.00 mm (0.118 in.)
TT	41457-PGH-000	3.025 mm (0.119 in.)
U	41458-P7T-000	3.05 mm (0.120 in.)

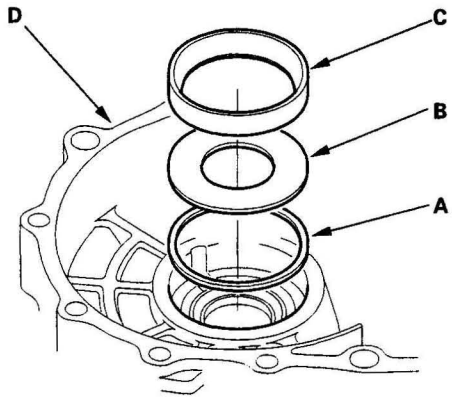
(cont'd)

BACK

Protected by AR

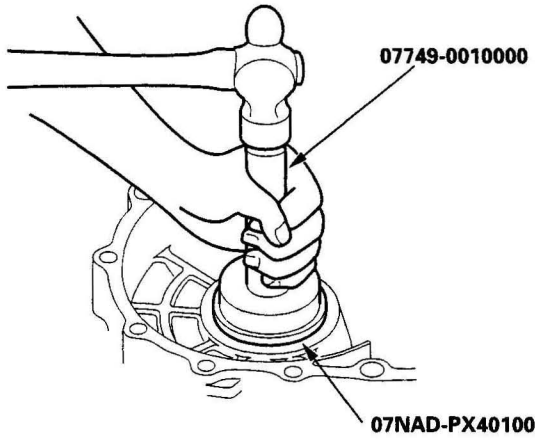
Carrier Bearing Preload Inspection (cont'd)

5. Install the thrust shim (A), thrust washer (B), and bearing outer race (C) in the transmission housing (D).

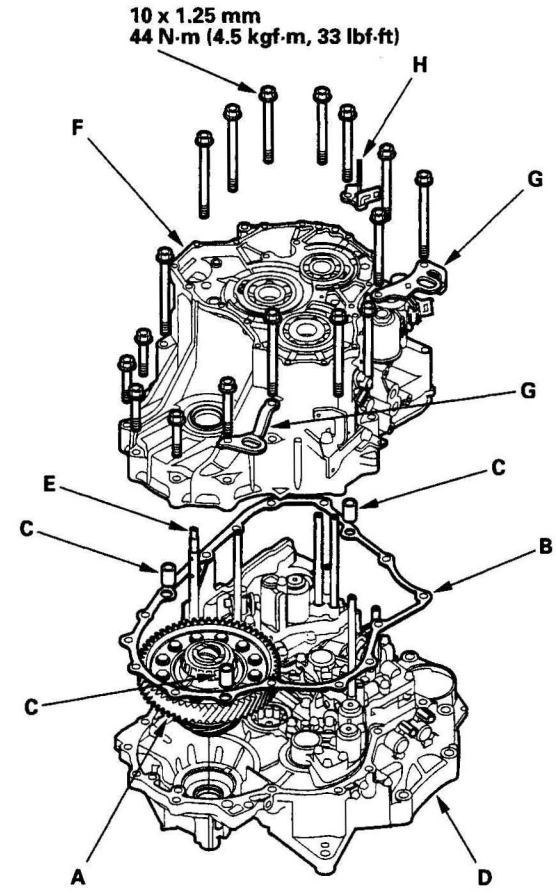


6. Drive the outer race with the special tools, and install it securely in the transmission housing.

7. Check that there is no clearance between the thrust washer, outer race, shim, and transmission housing.



8. Install the differential assembly (A), gasket (B), and dowel pins (C) on the torque converter housing (D). Align the spring pin on the control shaft (E) with the transmission housing groove.



9. Install the transmission housing (F) with the transmission hangers (G) and harness clamp bracket (H), then tighten the bolts.

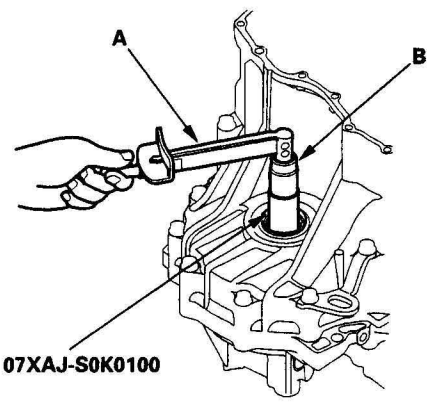
BACK

Protected by AR

10. Rotate the differential assembly in both directions to seat the bearings.

11. Measure the starting torque of the differential assembly with the special tools, a torque wrench (A) and a socket (B). Measure the starting torque at normal room temperature in both directions.

STANDARD:
New bearing: **2.7 – 3.9 N·m (28 – 40 kgf·cm, 24 – 35 lbf·in)**
Reused bearings: **2.5 – 3.6 N·m (25 – 37 kgf·cm, 22 – 32 lbf·in)**



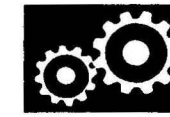
12. To increase the starting torque, increase the thickness of the shim. To decrease the starting torque, decrease the thickness of the shim. Changing the shim to the next size will increase or decrease starting torque about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 3 – 3 lbf·in).

Protected by AR

Transaxle

Driveline/Axle

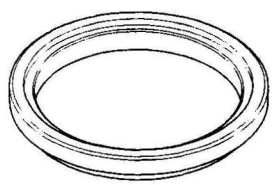
Special Tools 16-2
Driveshaft Inspection 16-3
Driveshafts Removal 16-3
Driveshafts Disassembly 16-5
Dynamic Damper Replacement 16-8
Driveshafts Reassembly 16-9
Driveshafts Installation 16-19
Intermediate Shaft Removal 16-21
Intermediate Shaft Disassembly 16-21
Intermediate Shaft Reassembly 16-23
Intermediate Shaft Installation 16-25



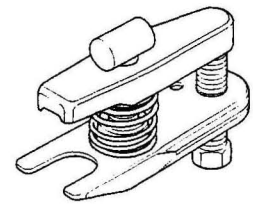
Protected by AR

Special Tools

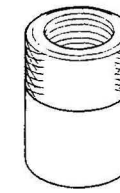
Ref. No.	Tool Number	Description	Qty
①	07LAF-SM40300	Support Base Attachment	1
②	07MAC-SL00200	Ball Joint Remover, 28 mm	1
③	07XAC-001020A	Threaded Adapter, 24 x 1.5 mm	1
④	07746-0010300	Attachment, 42 x 47 mm	1
⑤	07749-0010000	Driver	1
⑥	07947-SD90101	Oil Seal Driver Attachment	1
⑦	07947-4630100	Fork Seal Driver, 39.2 x 49.5 x 15 mm	1
⑧	07947-6340500	Driver Attachment	1
⑨	07965-SD90100	Support Base	1



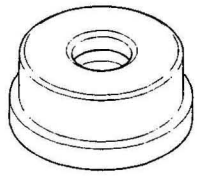
①



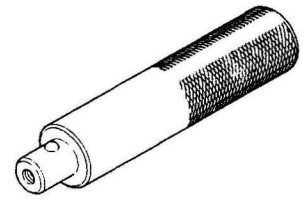
②



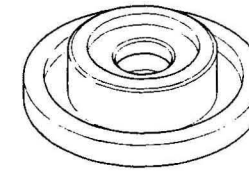
③



④



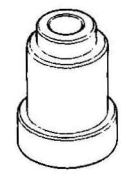
⑤



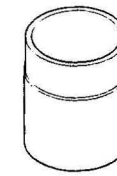
⑥



⑦



⑧



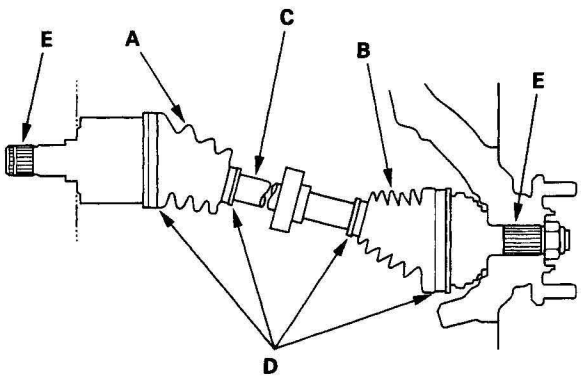
⑨

BACK

Protected by AR

Driveshaft Inspection

1. Check the inboard boot (A) and the outboard boot (B) on the driveshaft (C) for cracks, damage, leaking grease, and loose boot bands (D). If any damage is found, replace the boot and boot bands.



2. Turn the driveshaft by hand, and make sure the splines (E) and joint are not excessively loose.

3. Make sure the driveshaft is not twisted or cracked; if it is, replace it.

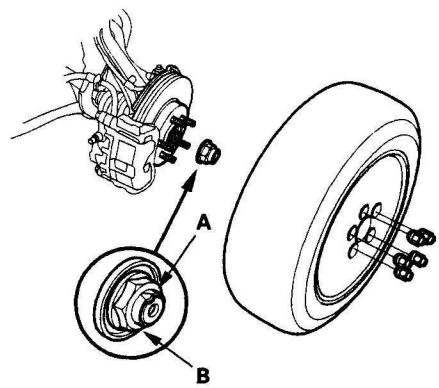
Driveshafts Removal

Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

1. Loosen the wheel nuts slightly.

2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-14).

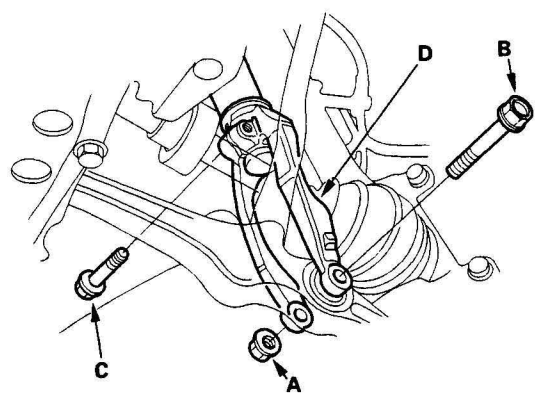
3. Remove the wheel nuts and front wheels.



4. Lift up the locking tab (A) on the spindle nut (B), then remove the nut.

5. '99 model: If the left driveshaft is removed, drain the transmission fluid (see page 14-109). It is not necessary to drain the transmission fluid when the right driveshaft is removed.
'00-03 models: If the left driveshaft is removed, drain the transmission fluid (see page 14-350). It is not necessary to drain the transmission fluid when the right driveshaft is removed.

6. Remove the self-locking nut (A) and 10 mm flange bolts (B and C), then remove the damper fork (D).



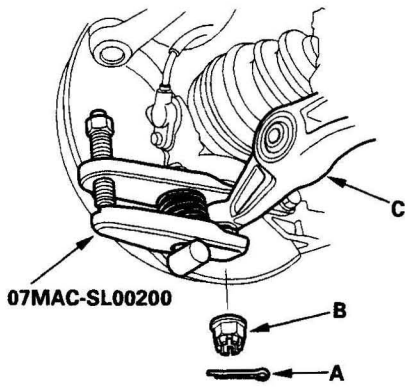
(cont'd)

BACK

Protected by AR

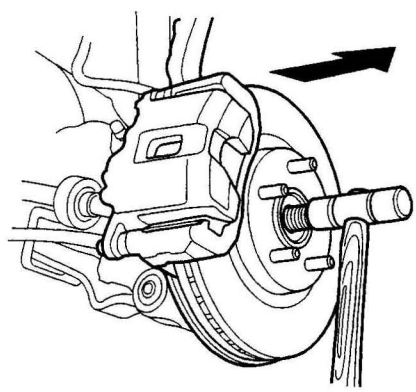
Driveshafts Removal (cont'd)

7. Remove the cotter pin (A) from the lower arm ball joint castle nut (B), and remove the nut.



8. Separate the ball joint from the lower arm (C) with the special tool (see page 18-9).

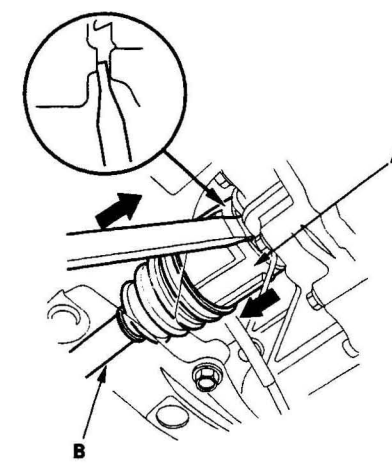
9. Remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.



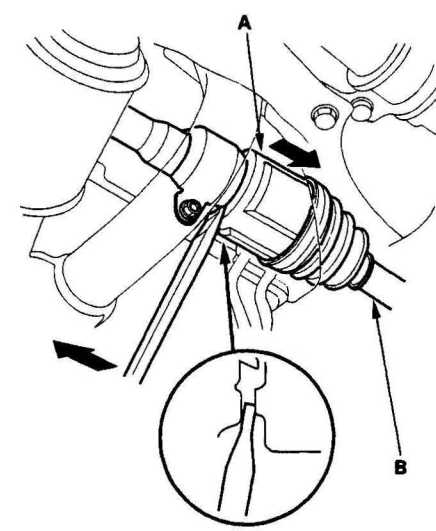
10. Pry the inboard joint (A) with a prybar, and remove the driveshaft from the differential case or bearing support as an assembly. Do not pull on the driveshaft (B), because the inboard joint may come apart. Draw the driveshaft straight out to avoid damaging the differential oil seal or the intermediate shaft outer seal.

NOTE: Use the following procedure if the left axle inboard joint is stuck in the differential.

–1 Remove the intermediate shaft.
–2 Look in the right side of the differential, and center the set ring on the end of the inboard joint with a long flat tip screwdriver.
–3 Pry the inboard joint away from the differential as described in step 10.



Right driveshaft with intermediate shaft:



BACK

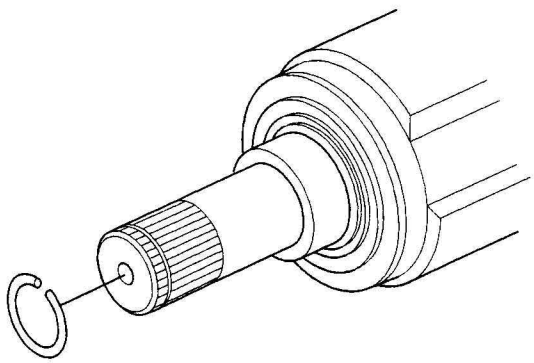
Protected by AR

Driveshafts Disassembly

Special Tools Required
- Threaded adapter, 24 x 1.5 mm 07XAC-001020A
- Slide hammer set, commercially available
- Boot band pincers, commercially available

Inboard Joint Side:

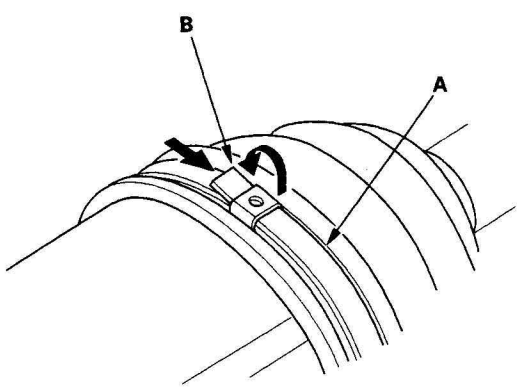
1. Remove the set ring from the inboard joint.



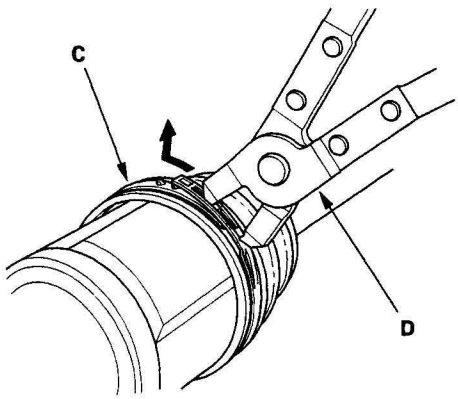
2. Remove the boot bands. Be careful not to damage the boot and dynamic damper.

   - If the boot band is a double loop type (A), lift up the band bend (B).
   - If the boot band is a welded type, cut the boot band.
   - If the boot band is a low profile type (C), pinch the boot band using a commercially available boot band pincers (D).

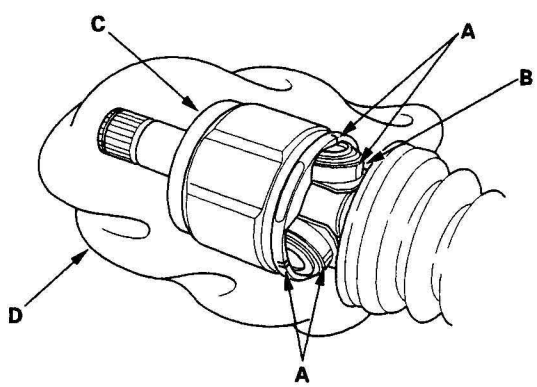
Double Loop Type



Low Profile Type



3. Make a mark (A) on each roller (B) and inboard joint (C) to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel (D). Be careful not to drop the rollers when separating them from the inboard joint.



(cont'd)

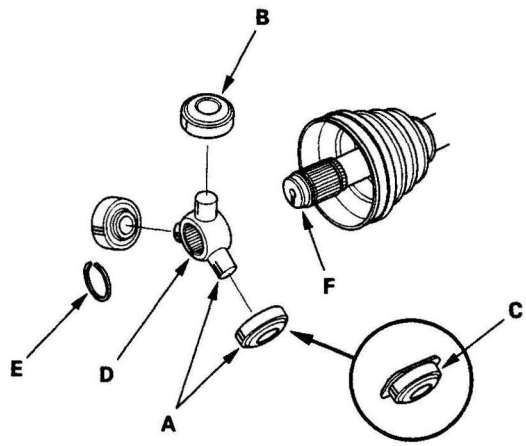
BACK

Protected by AR

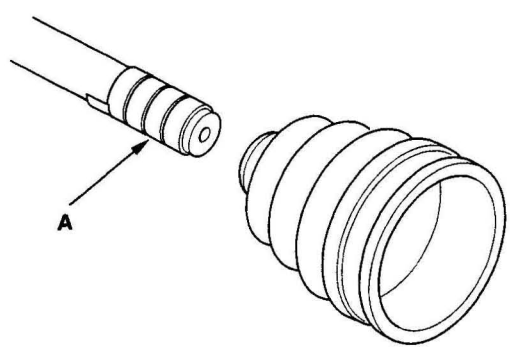
Driveshafts Disassembly (cont'd)

4. Make a mark (A) on the rollers (B or C) and spider (D) to identify the locations of rollers on the spider, then remove the rollers.

   NOTE: The roller (B) is '01-03 models; roller (C) is for '99-00 models.



5. Remove the circlip (E).
6. Mark the spider (D) and driveshaft (F) to identify the position of the spider on the shaft.
7. Remove the spider (D).
8. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



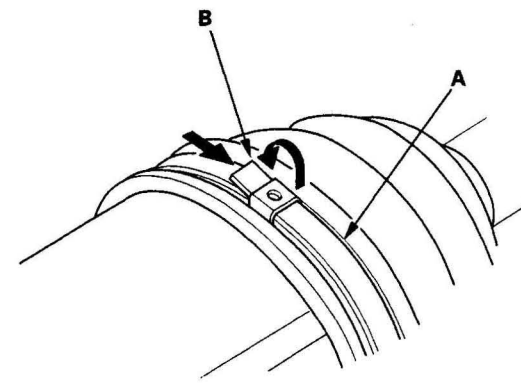
9. Remove the inboard boot. Be careful not to damage the boot.
10. Remove the vinyl tape.

Outboard Joint Side:

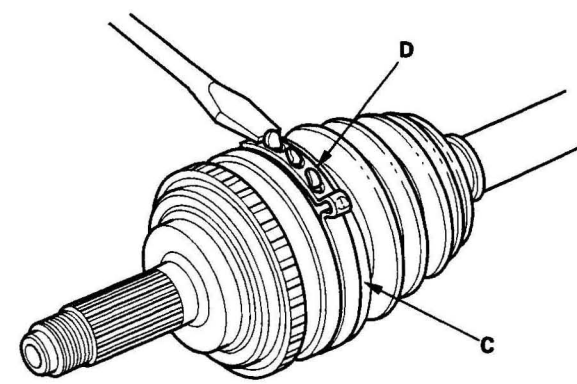
1. Remove the boot bands. Be careful not to damage the boot and dynamic damper.

   - If the boot band is a double loop type (A), lift up the band bend (B).
   - If the boot band is an ear clamp type (C), lift up the three tabs (D) with a screwdriver.

Double Loop Type (Rubber type boot)



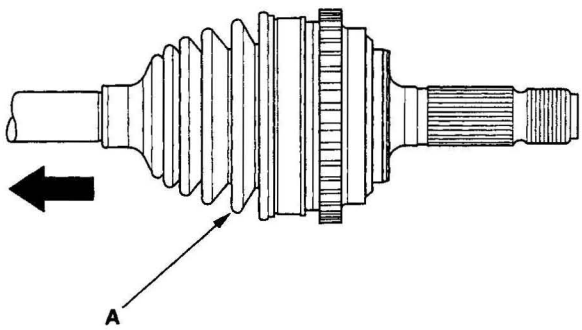
Ear Clamp Type (TPE type boot)



BACK

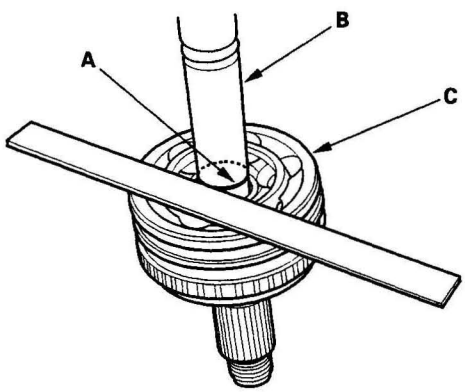
Protected by AR

2. Slide the outboard boot (A) to the inboard joint side. Be careful not to damage the boot.

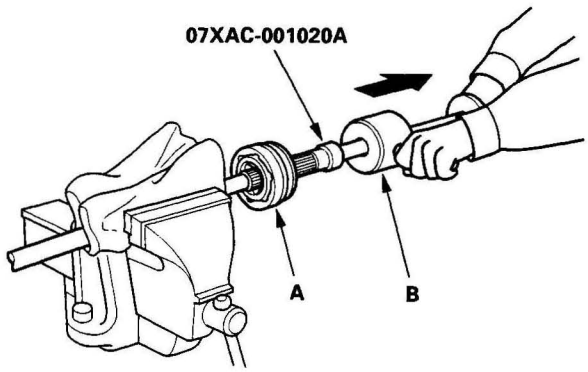


3. Wipe off the grease to expose the driveshaft and the outboard joint inner race.

4. Make a mark (A) on the driveshaft (B) at the same position of the outboard joint end (C).



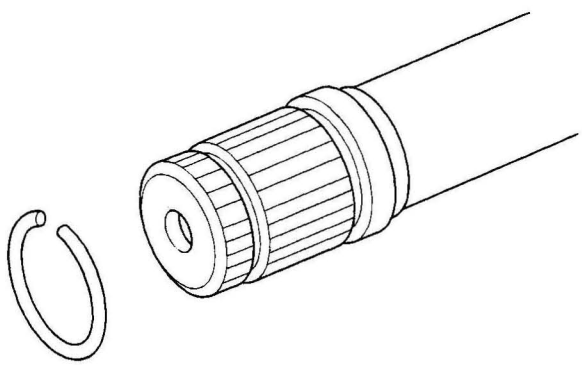
5. Carefully clamp the driveshaft in a vise.



6. Remove the outboard joint (A) using the special tool and a commercially available 5/8" x 18 slide hammer (B).

7. Remove the driveshaft from the vise.

8. Remove the stop ring from the driveshaft.



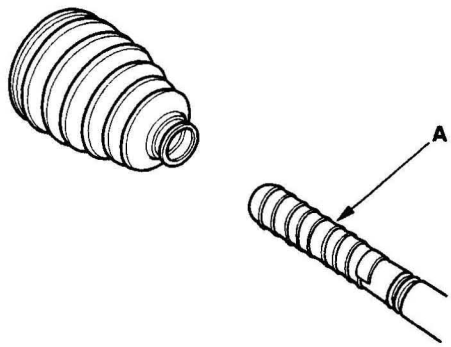
(cont'd)

BACK

Protected by AR

Driveshafts Disassembly (cont'd)

9. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



10. Remove the outboard boot. Be careful not to damage the boot.

11. Remove the vinyl tape.

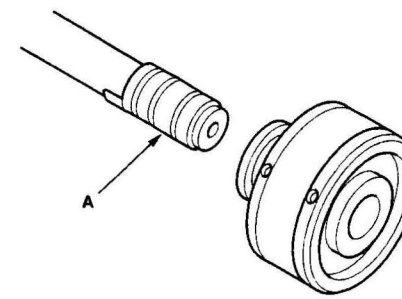
Dynamic Damper Replacement

1. Remove the inboard joint (see page 16-5).

2. Remove the dynamic damper bands. Be careful not to damage the dynamic damper (see page 16-5).

   - If the boot band is a welded type, cut the boot band.
   - If the boot band is a double loop type, lift up the band bend, and push it into the clip.
   - If the boot band is a low profile type, pinch the boot band using the commercially available boot band pincers.

3. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the dynamic damper.

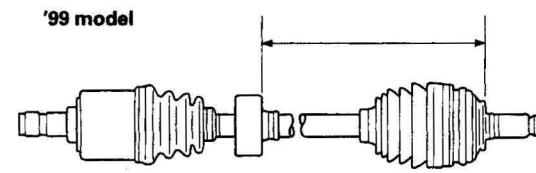


4. Remove the dynamic damper. Be careful not to damage the dynamic damper.

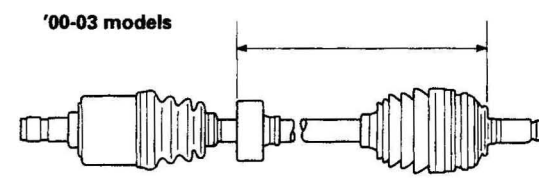
5. Adjust the position of the new dynamic damper to the figure below.

'99 model: 251–255 mm (9.9–10.0 in.)
'00-03 models: 276.3–281.3 mm (10.88–11.07 in.)

'99 model



'00-03 models



6. Install the dynamic damper band (see step 13 on page 16-13).

7. Install the inboard joint (see step 2 on page 16-19).

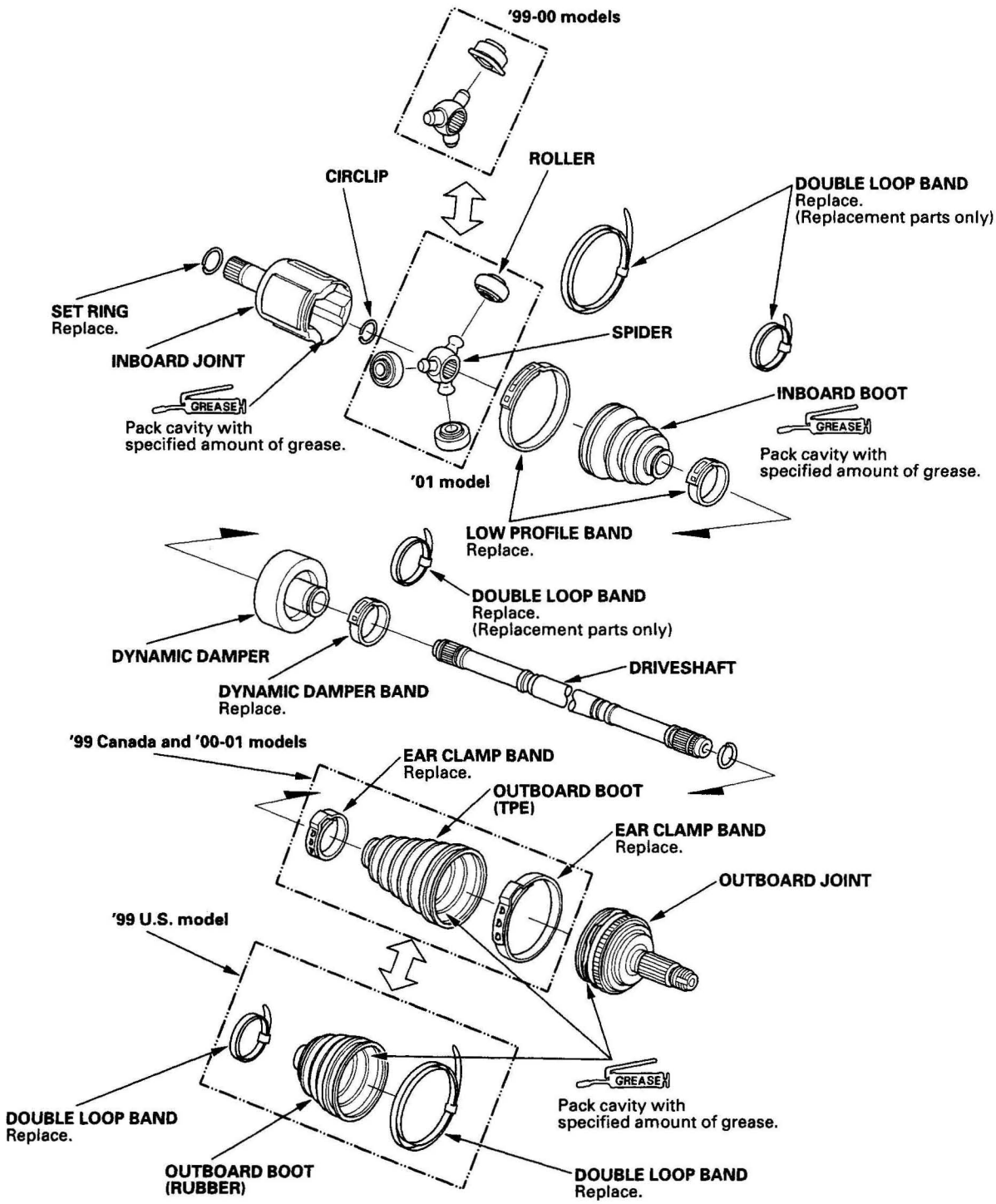
BACK

Protected by AR

Driveshafts Reassembly

Exploded View

'99-01 models



(cont'd)

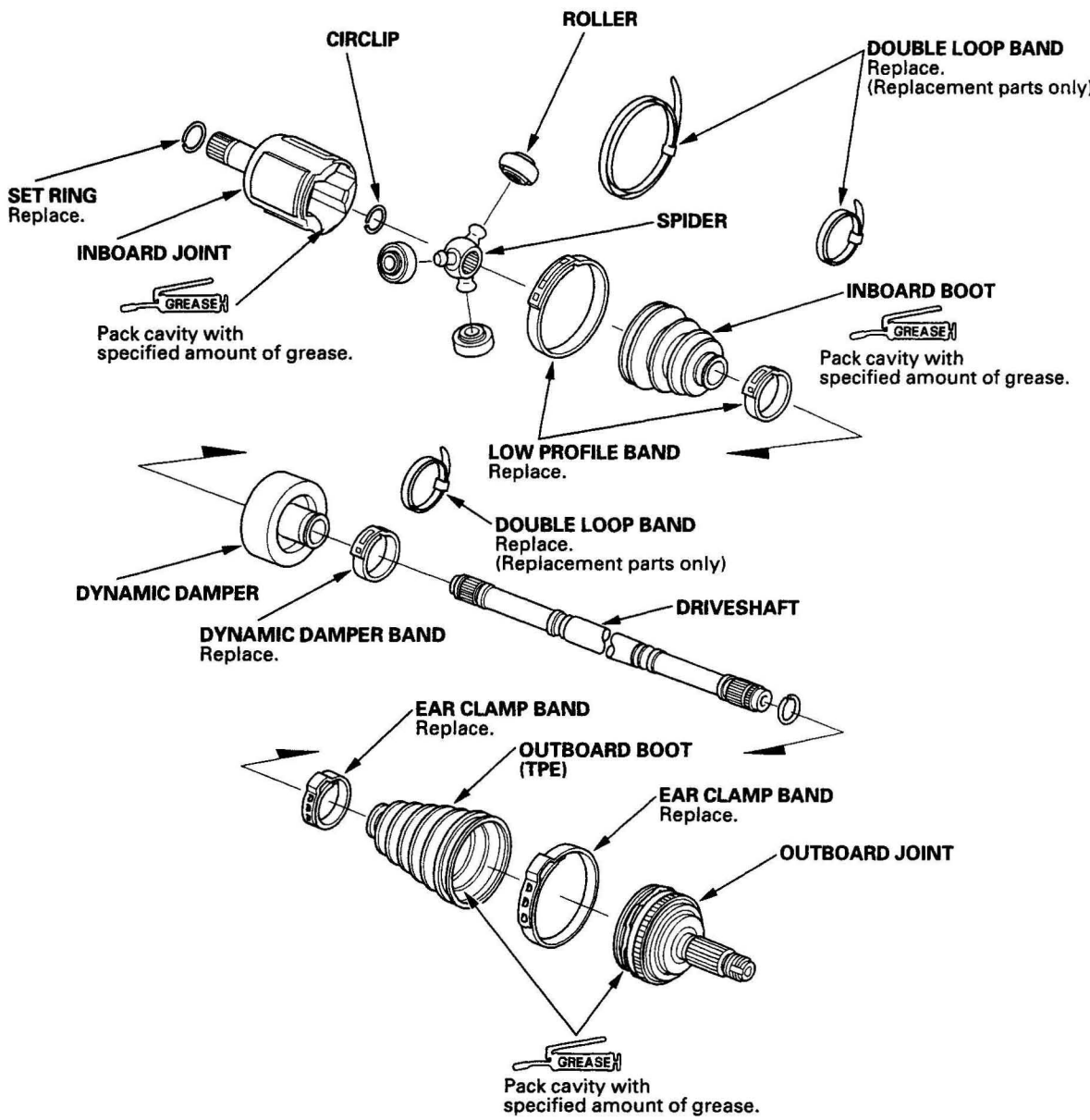
BACK

Protected by AR

Driveshafts Reassembly (cont'd)

Exploded View

'02-03 models



BACK

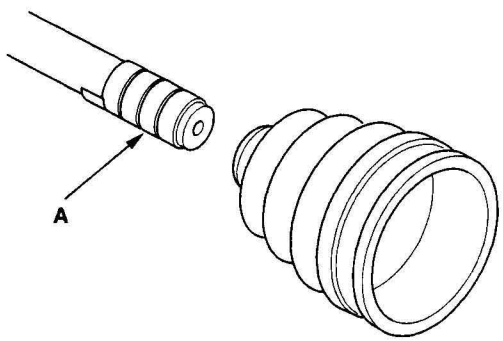
Protected by AR

Special Tools Required
- Boot band tool, KD-3191 or equivalent, commercially available
- Boot band pincers, Kent-Moore J-35910 or equivalent, commercially available

NOTE: Refer to the Exploded View as needed during this procedure.

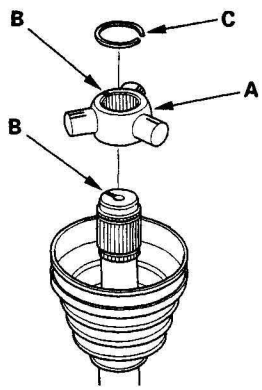
Inboard Joint Side:

1. Wrap the splines with vinyl tape (A) to prevent damage to the inboard boot.



2. Install the inboard boot on the driveshaft, then remove the vinyl tape. Be careful not to damage the inboard boot.

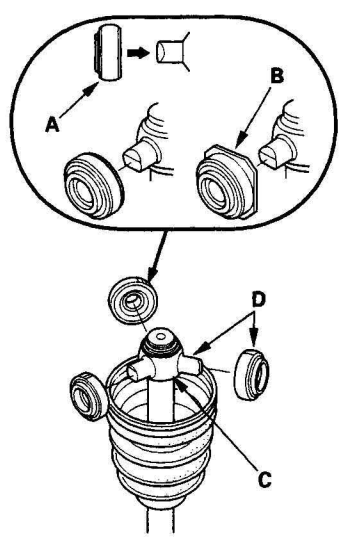
3. Install the spider (A) on the driveshaft by aligning the marks (B) on the spider and end of the driveshaft.



4. Fit the circlip (C) into the driveshaft groove. Always rotate the circlip in its groove to make sure it is fully seated.

5. Fit the rollers (A or B) onto the spider (C) with their high shoulders facing outward, and note these items;

   - Reinstall the rollers in their original positions on the spider by aligning the marks (C).
   - Hold the driveshaft pointed up to prevent the rollers from falling off.
   - The roller (A) is for '01-03 models, roller (B) is for '99-00models.



(cont'd)

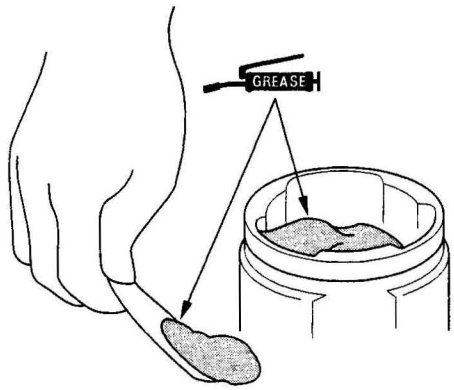
BACK

Protected by AR

Driveshafts Reassembly (cont'd)

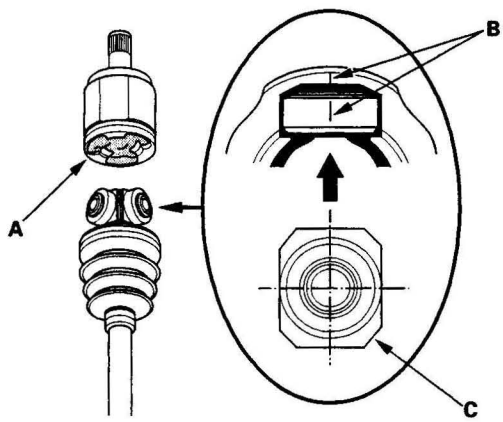
6. Pack the inboard joint with the joint grease included in the new driveshaft set.

   Grease quantity
   '99-01 models Inboard joint:
   120 – 130 g (4.2 – 4.6 oz)
   '02-03 models Inboard joint:
   150 – 160 g (5.3 – 5.7 oz)



7. Fit the inboard joint (A) onto the driveshaft, and note these items:

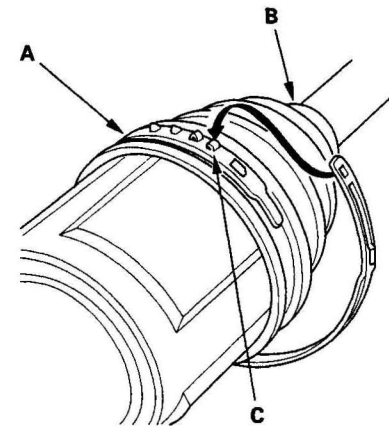
   - Reinstall the inboard joint (A) onto the driveshaft by aligning the marks (B) on the inboard joint and the rollers.
   - Hold the driveshaft with the inboard joint pointing up to prevent it from falling off.
   - For '99-00 models, align the roller holders (C) with the grooves in the inboard joint.



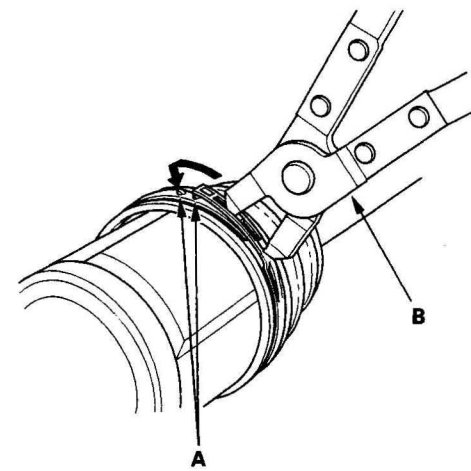
8. Make sure the ends of the boot are seated in the grooves in the driveshaft and joint, then install the boot bands.

   - For the double loop type, go to step 12. (Replacement boot bands only)
   - For the low profile type, go to step 9.

9. Install the new low profile band (A) onto the boot (B), then hook the tab (C) of the band.



10. Close the hook portion of the band (A) with a commercially available boot band pincers (B), then hook the tabs of the band.



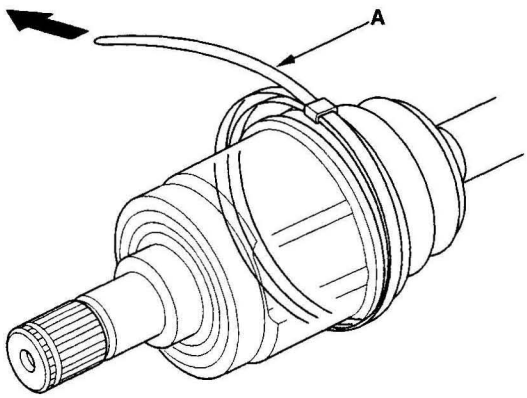
11. Install the boot band on the other end of the boot, and repeat steps 9 and 10.

BACK

Protected by AR

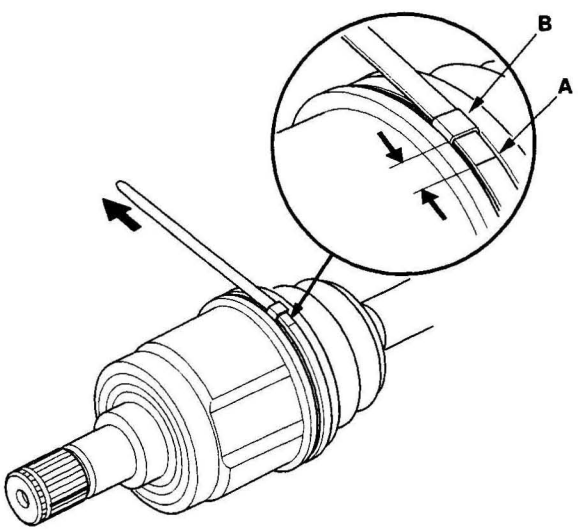
12. Adjust the inboard joint until the rollers are in the middle of the joint.

13. Fit the boot ends onto the driveshaft and the inboard joint, then install the new double loop band (A) onto the boot.

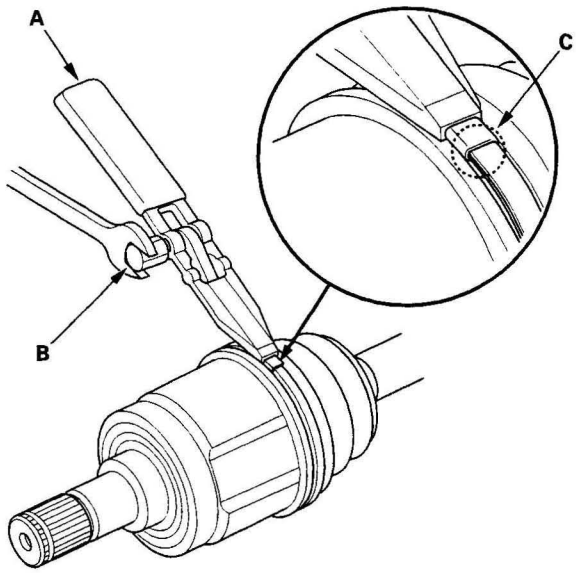


14. Pull up the slack in the band by hand.

15. Make a mark (A) on the band 10—14 mm (0.4—0.6 in.) from the clip (B).

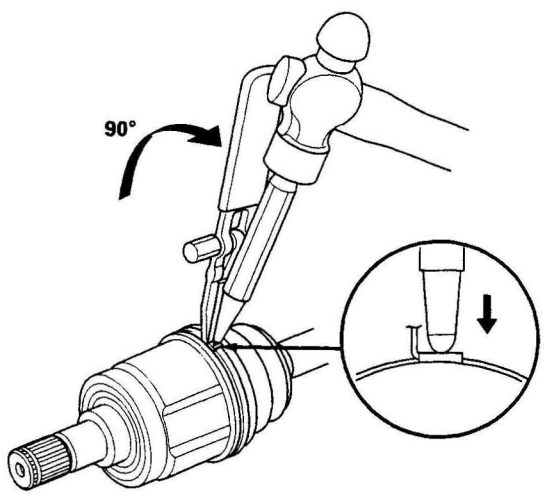


16. Thread the free end of the band through the nose section of the commercially available boot band tool KD-3191 or equivalent (A), and into the slot on the winding mandrel (B).



17. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot (C) on the band meets the edge of the clip.

18. Lift up the boot band tool to bend the free end of the band 90° to the clip. Center-punch the clip, then fold over the remaining tail onto the clip.

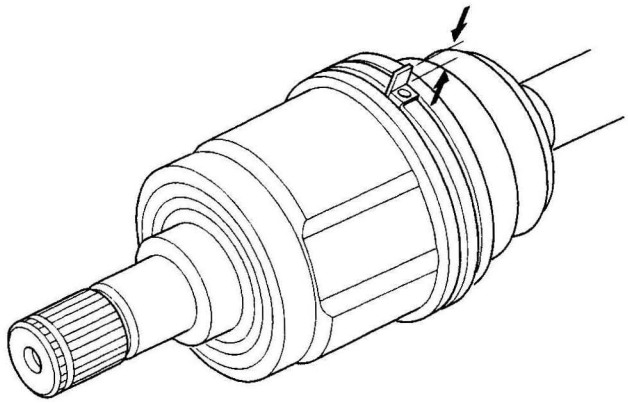


(cont'd)

Protected by AR

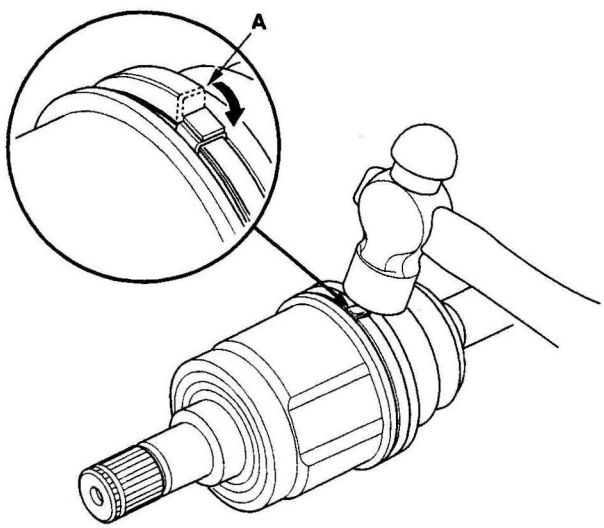
Driveshafts Reassembly (cont'd)

19. Unwind the boot band tool, and cut off the excess free end of the band to leave a 5—10 mm (0.2—0.4 in.) tail protruding from the clip.



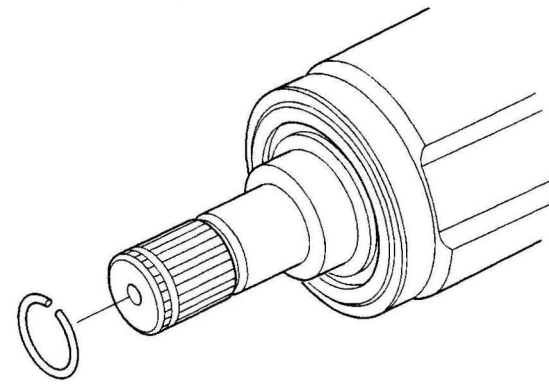
20. Bend the band end (A) by tapping it down with a hammer.

NOTE:
- Make sure the band and clip do not interfere with anything, and the band does not move.
- Remove any grease remaining on the surrounding surfaces.



21. Repeat steps 12 through 20 for the band on the other end of the boot.

22. Install the new set ring.



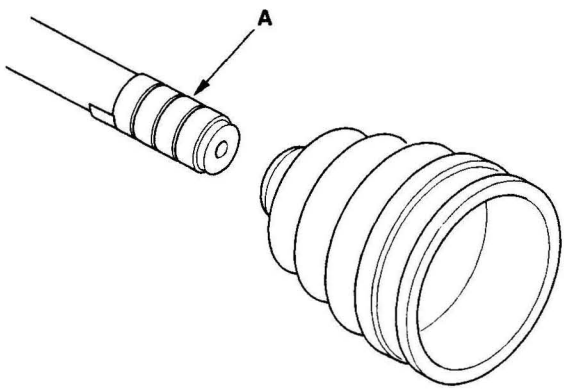
BACK

Protected by AR

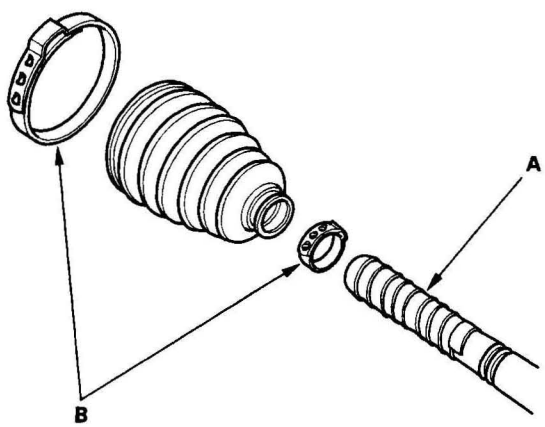
Outboard Joint Side:

1. Wrap the splines with vinyl tape (A) to prevent damage to the outboard boot.

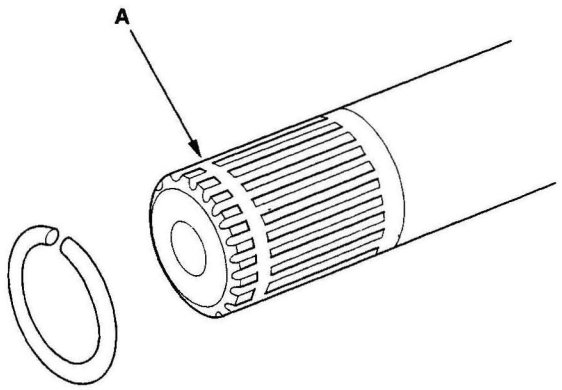
Rubber type



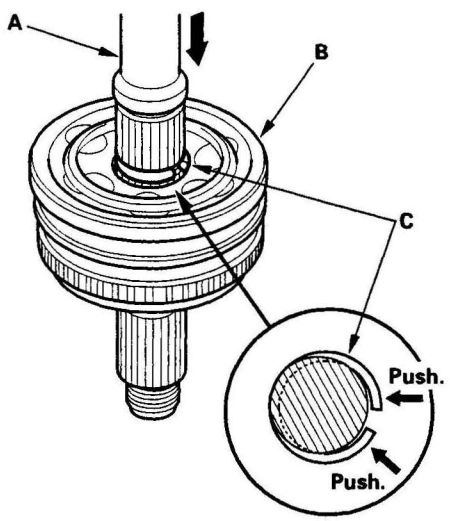
TPE type



2. Install the new boot bands (B) (TPE type).
3. Install the outboard boot. Be careful not to damage the outboard boot.
4. Remove the vinyl tape.
5. Install the new stop ring into the driveshaft groove (A).



6. Insert the driveshaft (A) into the outboard joint (B) until the stop ring (C) is close to the joint.



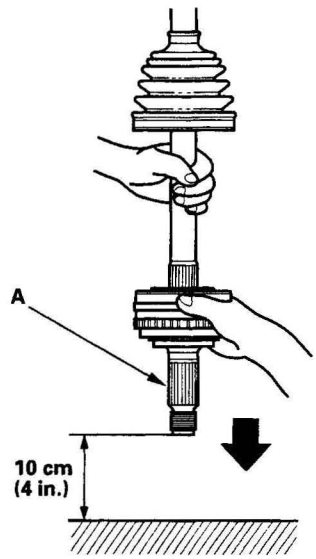
(cont'd)

BACK

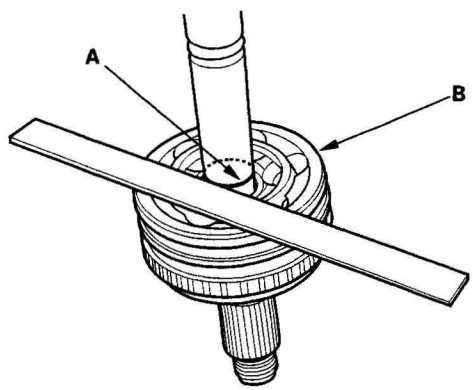
Protected by AR

Driveshafts Reassembly (cont'd)

7. To completely seat the outboard joint, pick up the driveshaft and joint, and drop them from about 10 cm (4 in.) onto a hard surface. Do not use a hammer as excessive force may damage the driveshaft. Be careful not to damage the threaded section (A) of the outboard joint.

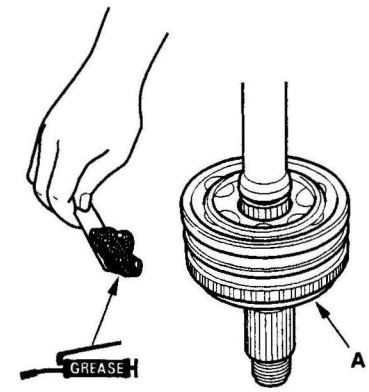


8. Check the alignment of the paint mark (A) with the outboard joint end (B).



9. Pack the outboard joint (A) with the joint grease included in the new joint boot set.

Grease quantity
Outboard joint (Rubber): 130–140 g (4.6–4.9 oz)
Outboard joint (TPE): 140–150 g (4.9–5.3 oz)

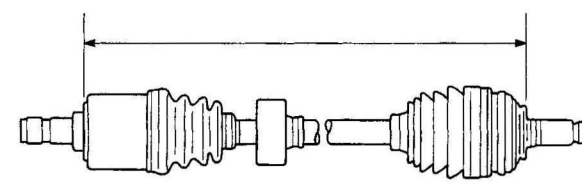


10. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension. Make sure the ends of the boots seat in the groove of the driveshaft and joint.

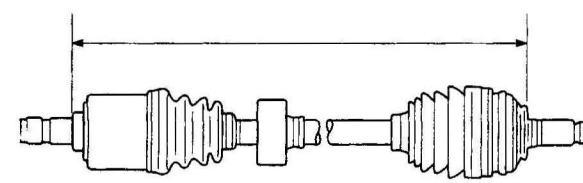
'99 model:
Left Driveshaft: 542–547 mm (21.3–21.5 in.)
Right Driveshaft: 532–537 mm (20.9–21.1 in.)

'00-03 models:
Left Driveshaft: 554–559 mm (21.8–22.0 in.)
Right Driveshaft: 544–549 mm (21.4–21.6 in.)

'99 model



'00-03 models



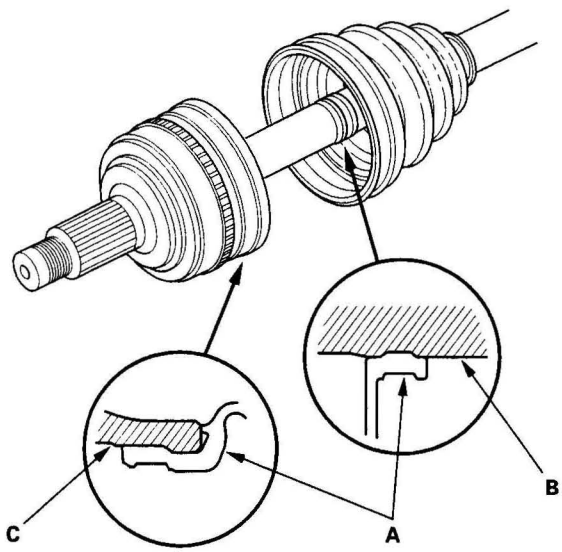
BACK

Protected by AR

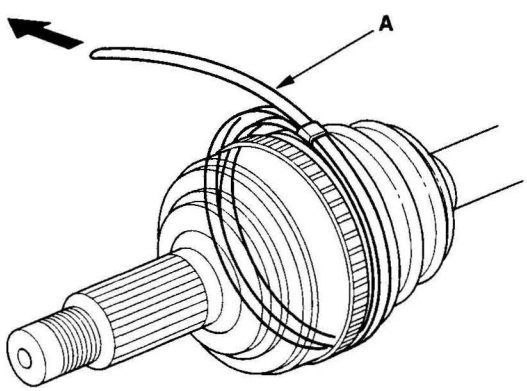
11. Install the boot bands.

    - For rubber type boot, go to step 12.
    - For TPE type boot, go to step 22.

12. Fit the boot (A) ends onto the driveshaft (B) and outboard joint (C).

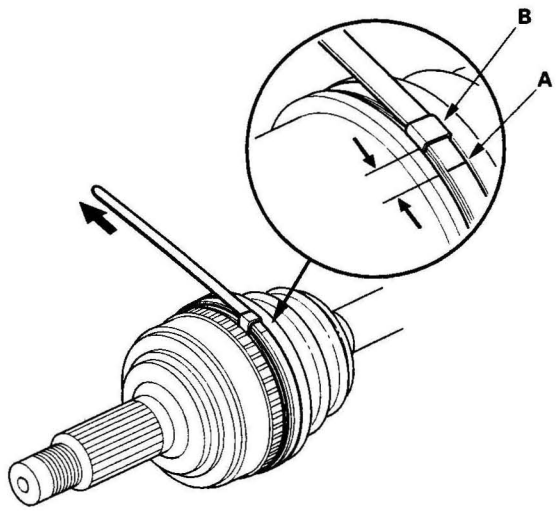


13. Fit the boot ends onto the driveshaft and the inboard joint, then install the new double loop band (A) onto the boot.

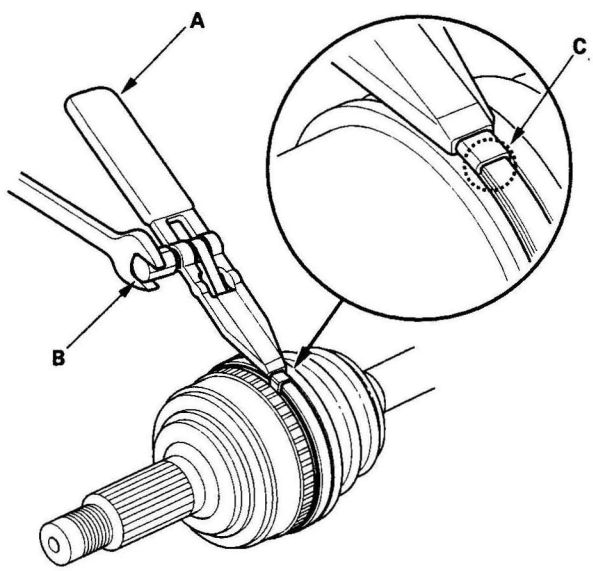


14. Pull up the slack in the band by hand.

15. Make a mark (A) on the band 10 – 14 mm (0.4 – 0.6 in.) from the clip (B).



16. Thread the free end of the band through the nose section of the commercially available boot band tool KD-3191 or equivalent(A), and into the slot on the winding mandrel (B).



17. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot (C) on the band meets the edge of the clip.

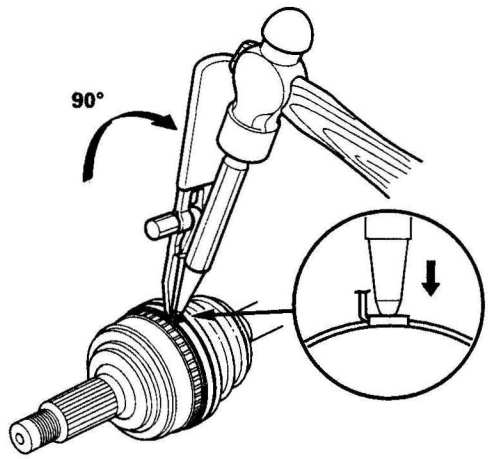
(cont'd)

BACK

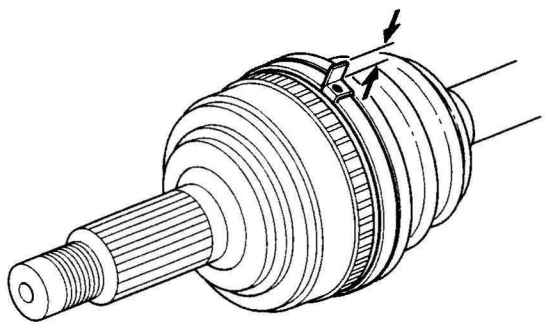
Protected by AR

Driveshafts Reassembly (cont'd)

18. Lift up the boot band tool to bend the free end of the band 90° to the clip. Center punch the clip, then fold over the remaining tail onto the clip.

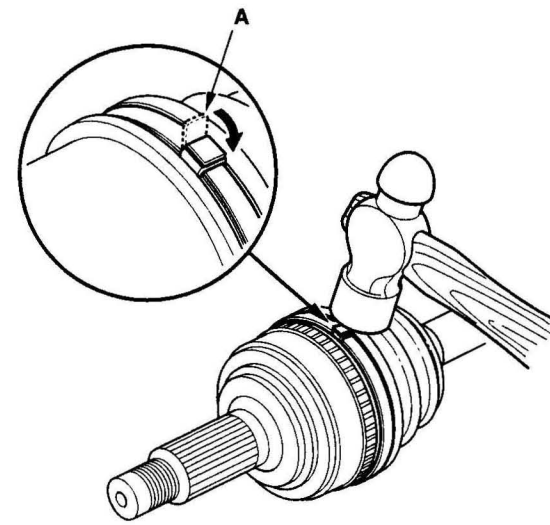


19. Unwind the boot band tool, and cut off the excess free end of the band to leave 5—10 mm (0.2—0.4 in.) from the clip.



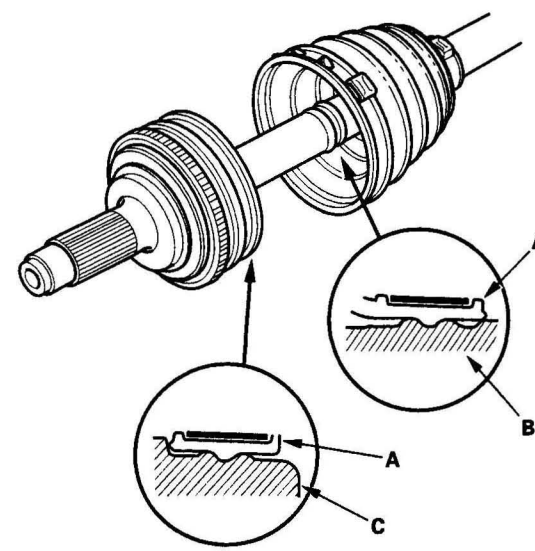
20. Bend the band end (A) by tapping it down with a hammer.

NOTE:
- Make sure the band and clip do not interfere with anything, and the band does not move.
- Remove any grease remaining on the surrounding surfaces.



21. Install the boot band on the other end of the boot, and repeat step 14 through 20.

22. Fit the boot (A) ends onto the driveshaft (B) and outboard joint (C).

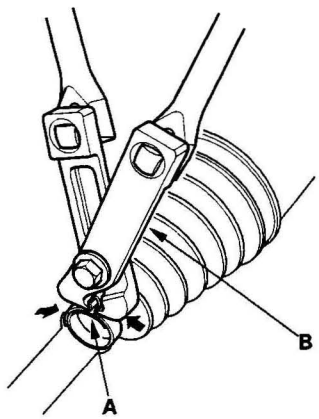


BACK

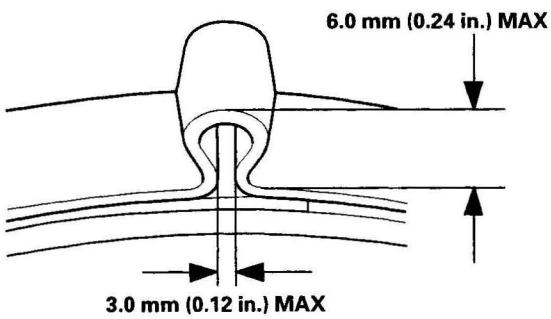
Protected by AR

Driveshafts Installation

23. Close the ear portion (A) of the band with a commercially available boot band pincers Kent-Moore J-35910 or equivalent (B).

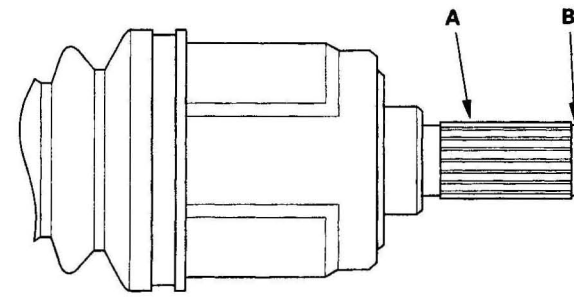


24. Check the clearance between the closed ear portion of the band. If the clearance is not within the standard, close the ear portion of the band further.



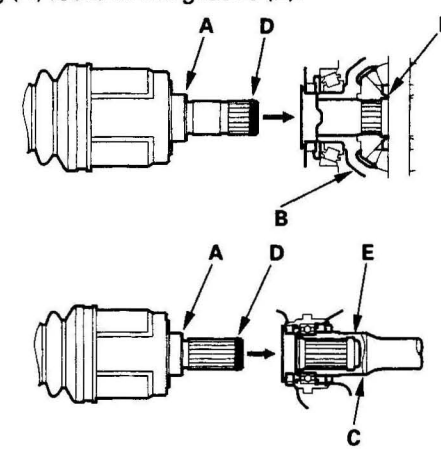
25. Repeat steps 23 and 24 for the band on the other end of the boot.

1. Apply 0.3 – 1.0 g (0.01 – 0.04 oz) of specified grease to the whole splined surface (A) of the left driveshaft (for vehicles with intermediate shaft). After applying grease, remove the grease from the splined grooves at intervals of 2 – 3 splines and from the set ring groove (B) so that air can bleed from the intermediate shaft.



2. Install a new set ring onto the set ring groove of the driveshaft.

3. Clean the areas where the driveshaft contacts the differential thoroughly with solvent or brake cleaner, and dry with compressed air. Insert the inboard end (A) of the driveshaft into the differential (B) or intermediate shaft (C) unitl the set ring (D) locks in the groove (E).

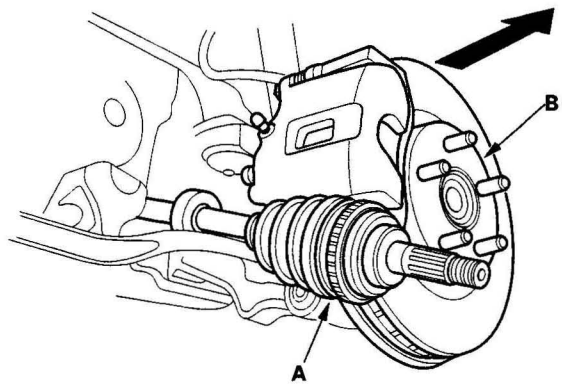


(cont'd)

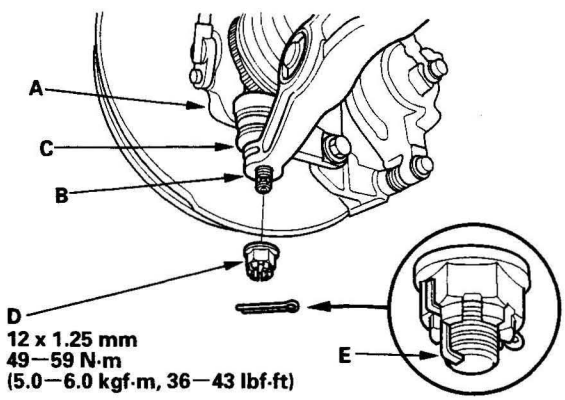
Protected by AR

Driveshafts Installation (cont'd)

4. Install the outboard joint (A) into the front hub (B).

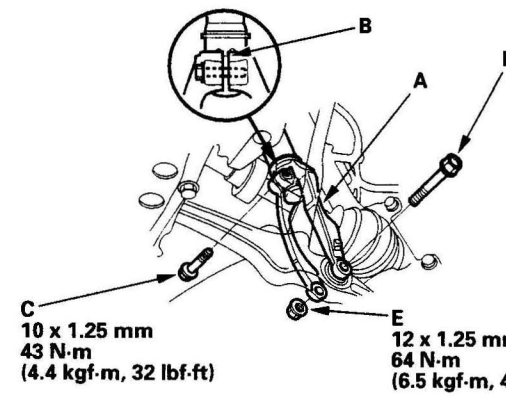


5. Install the knuckle (A) onto the lower arm (B). Be careful not to damage the ball joint boot (C). Wipe off the grease before tightening the nut at the ball joint. Torque the new castle nut (D) to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.



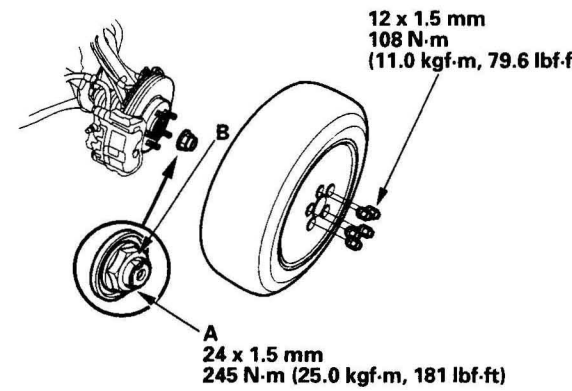
6. Install the new cotter pin (E) into the pin hole, and bend the cotter pin as shown.

7. Install the damper fork (A) over the driveshaft and onto the lower arm. Install the damper in the damper fork so the aligning tab (B) is aligned with the slot in the damper fork. Loosely install the flange bolt (C).



8. Loosely install the flange bolt (D) and a new self-locking nut (E).

9. Install a new spindle nut (A), then tighten the nut. After tightening, use a drift to stake the spindle nut shoulder (B) against the driveshaft.



10. Clean the mating surfaces of the brake disc and the front wheel, then install the front wheel with the wheel nuts.

11. Tighten the flange bolts and the self-locking nut with the vehicle's weight on the damper.

12. '99 model: Refill the transmission with recommended fluid (see page 14-109).
'00-03 models: Refill the transmission with recommended fluid (see page 14-350).

13. Check the front wheel alignment, and adjust it if necessary (see page 18-5).

BACK

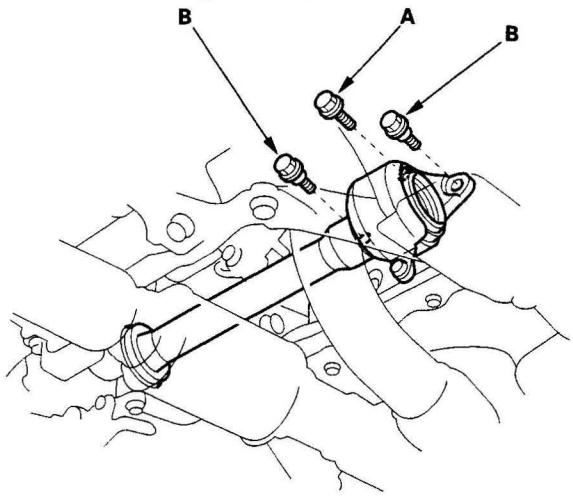
Protected by AR

Intermediate Shaft Removal

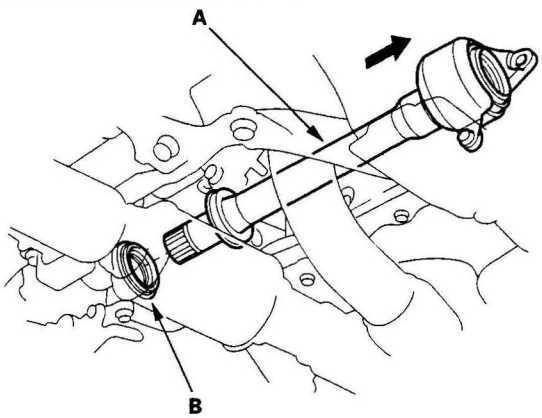
1. '99 model: Drain the transmission fluid (see page 14-109).
   '00-03 models: Drain the transmission fluid (see page 14-350).

2. Remove the left driveshaft (see page 16-3).

3. Remove the flange bolt (A) and two dowel bolts (B).



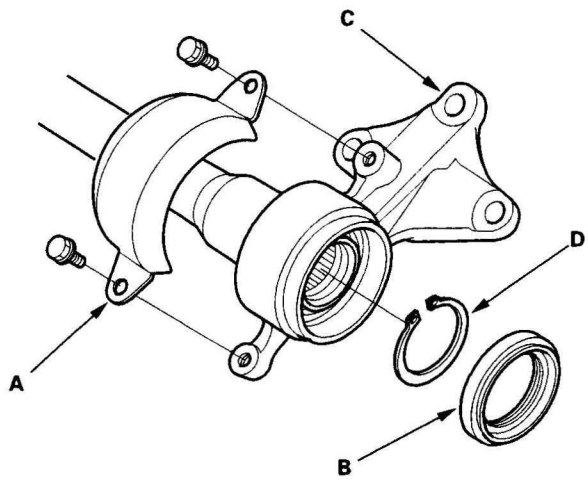
4. Remove the intermediate shaft (A) from the differential. Hold the intermediate shaft horizontal until it is clear of the differential to prevent damage to the differential oil seal (B).



Intermediate Shaft Disassembly

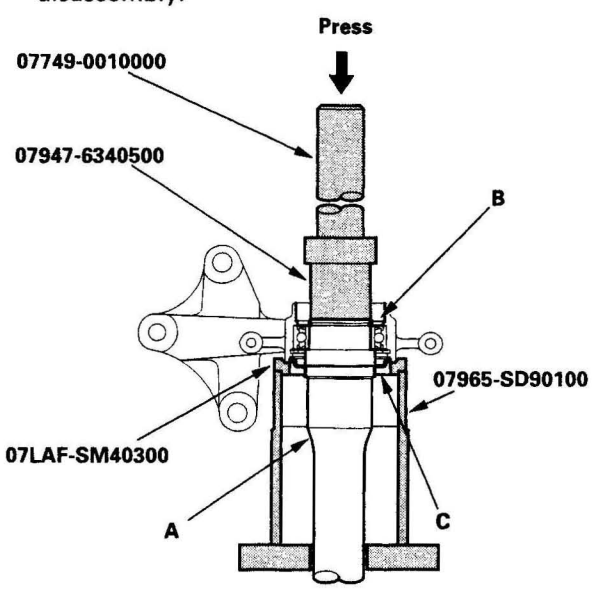
Special Tools Required
- Driver 07749-0010000
- Driver attachment 07947-6340500
- Support base attachment 07LAF-SM40300
- Support base 07965-SD90100
- Attachment, 42 x 47 mm 07746-0010300

1. Remove the heat shield (A) and outer seal (B) from the bearing support (C).



2. Remove the external snap ring (D).

3. Press the intermediate shaft (A) out of the intermediate shaft bearing (B) using the special tools and a press. Be careful not to damage the metal rings (C) on the intermediate shaft during disassembly.

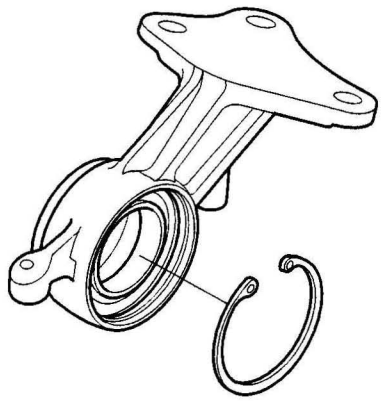


(cont'd)

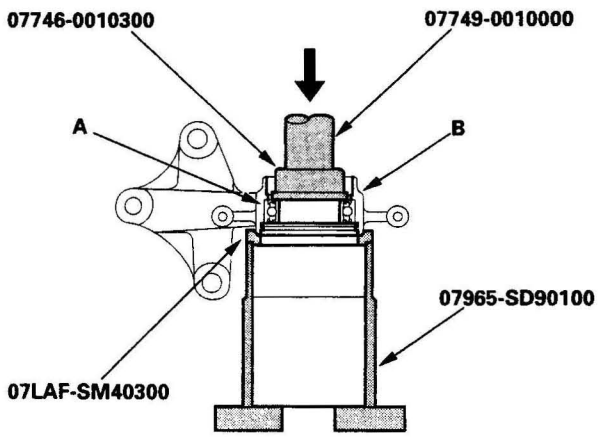
Protected by AR

Intermediate Shaft Disassembly (cont'd)

4. Remove the internal snap ring.



5. Press the intermediate shaft bearing (A) out of the bearing support (B) using the special tools and a press.

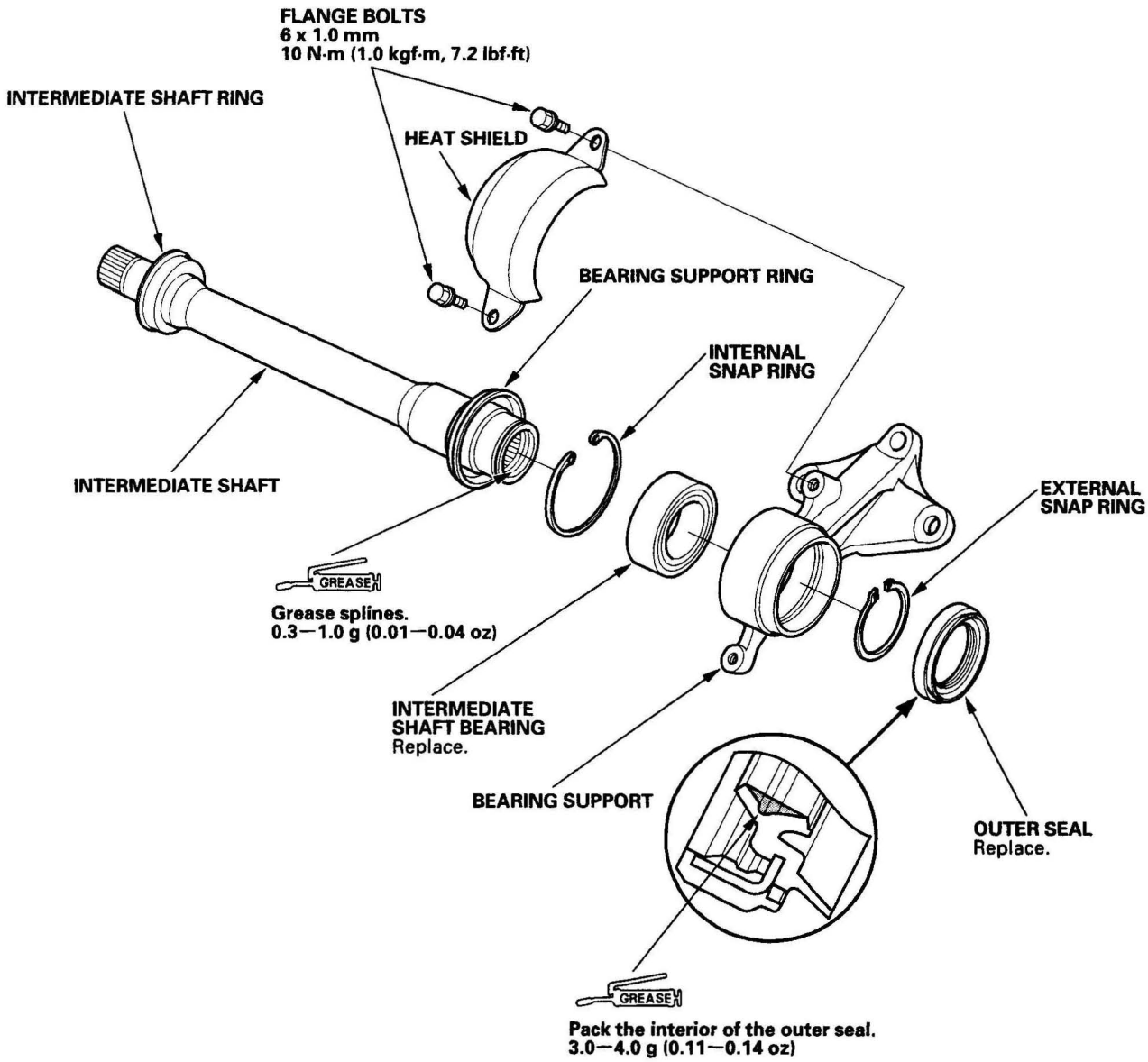


BACK

Protected by AR

Intermediate Shaft Reassembly

Exploded View



(cont'd)

BACK

Protected by AR

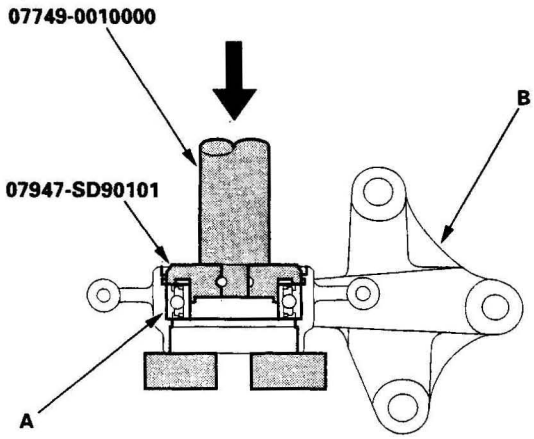
Intermediate Shaft Reassembly (cont'd)

Special Tools Required
- Driver 07749-0010000
- Support base attachment 07LAF-SM40300
- Support base 07965-SD90100
- Oil seal driver attachment 07947-SD90101
- Fork seal driver, 39.2 x 49.5 x 15 mm 07947-4630100

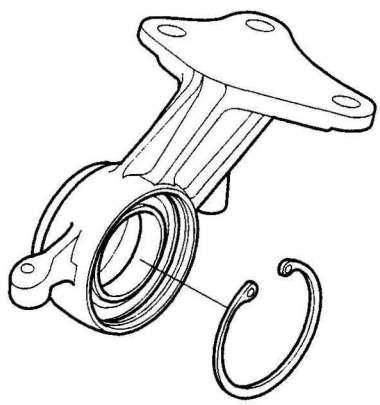
NOTE: Refer to the Exploded View as needed during this procedure.

1. Clean the disassembled parts with solvent, and dry them with compressed air. Do not wash the rubber parts with solvent.

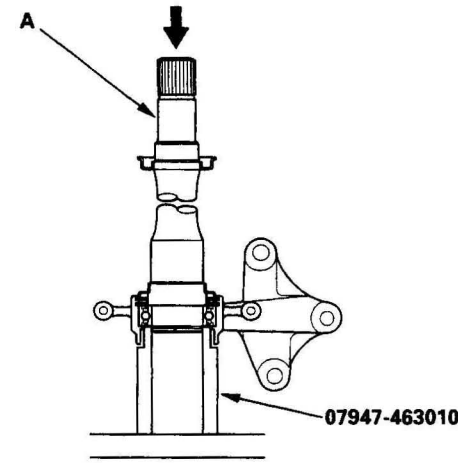
2. Press the intermediate shaft bearing (A) into the bearing support (B) using the special tools and a press.



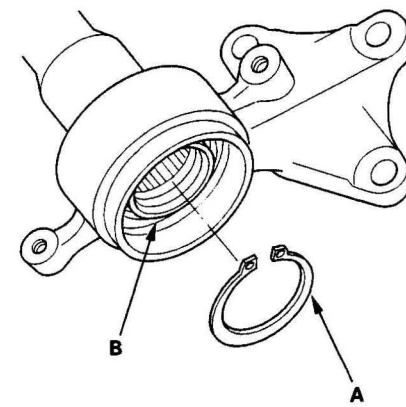
3. Seat the internal snap ring into the groove of the bearing support.



4. Press the intermediate shaft (A) into the shaft bearing using the special tool and a press.



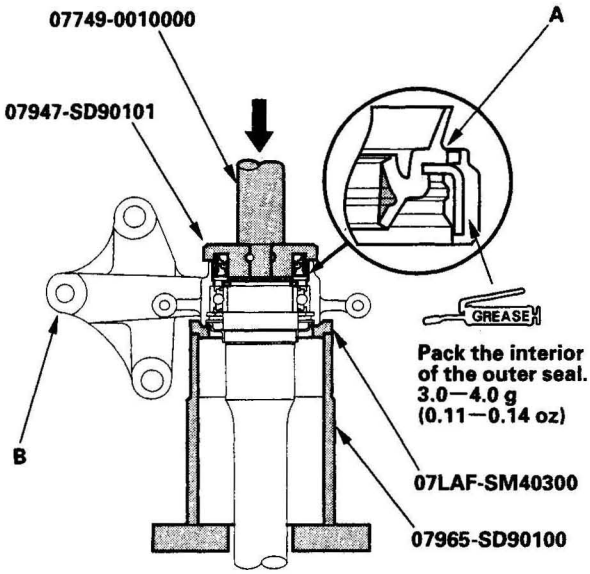
5. Seat the external snap ring (A) into the groove of the intermediate shaft (B).



BACK

Protected by AR

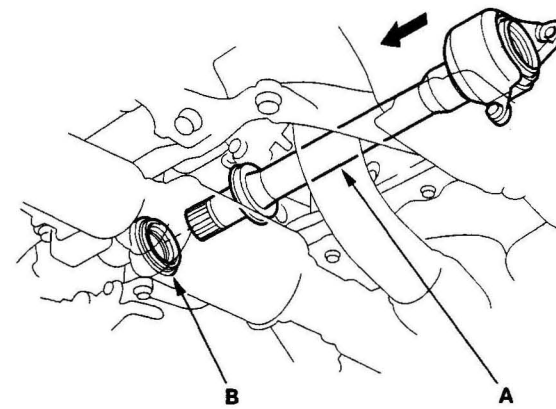
6. Pack the interior of the outer seal (A). Install the outer seal into the bearing support (B) using the special tools and a press.



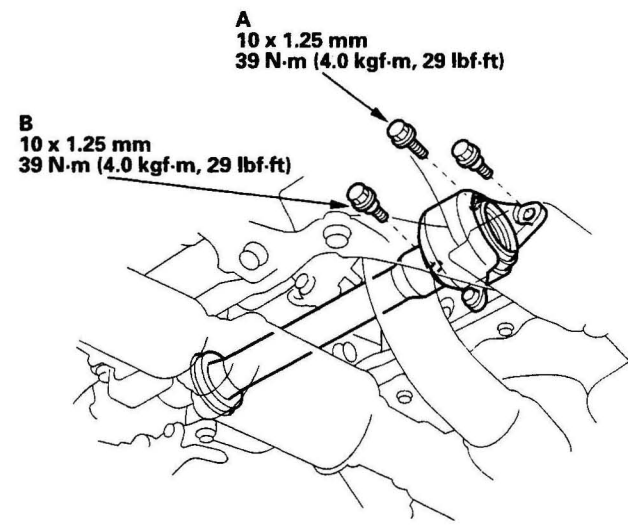
7. Install the heat shield onto the bearing support.

Intermediate Shaft Installation

1. Use solvent or carburetor cleaner to thoroughly clean the areas where the intermediate shaft (A) contacts the transmission (differential) and dry with compressed air. Insert the intermediate shaft assembly into the differential. Hold the intermediate shaft horizontal to prevent damage to the differential oil seal (B).



2. Install the flange bolt (A) and two dowel bolts (B).



3. Install the right driveshaft (see page 16-19).

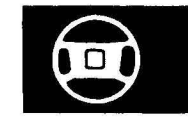
BACK

Protected by AR

Steering

Power Steering

Special Tools 17-2
Component Location Index 17-3
Symptom Troubleshooting Index 17-5
Hard Steering Troubleshooting 17-7
Steering Wheel Rotational Play Check 17-8
Power Assist Check with Vehicle Parked 17-8
Power Assist Check at Road Speed 17-9
Power Steering Speed Sensor Replacement 17-10
Steering Linkage and Gearbox Inspection 17-11
Pump Pressure Test with T/N 07406-0010001 17-12
Pump Pressure Test with T/N 07406-001000A 17-13
Fluid Leakage Inspection 17-14
Pump Belt Inspection and Adjustment 17-16
Fluid Replacement 17-18
Hoses, Lines and Pressure Switch Replacement 17-19
Pump Replacement 17-21
Pump Overhaul 17-22
Steering Wheel Removal 17-27
Steering Wheel Disassembly and Reassembly 17-28
Steering Wheel Installation 17-29
Steering Column Removal and Installation 17-30
Steering Column/Tilt Lever Inspection/
Adjustment 17-32
Steering Lock Replacement 17-33
Rack Guide Adjustment 17-34
Steering Gearbox Removal 17-35
Steering Gearbox Overhaul 17-38
Steering Gearbox Installation 17-69
Tie-Rod Ball Joint Boot Replacement 17-75

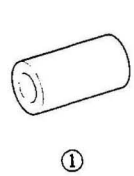


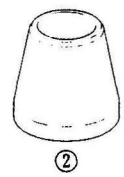
Protected by AR

Special Tools

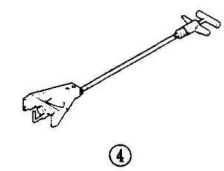
Ref.No.	Tool Number	Description	Qty
①	07GAF-PH70100	Pilot Collar	1
②	07HAG-SF10100 or 07HAG-SF1010A	Piston Seal Ring Guide	1
③	07HAG-SF1020A or 07HAG-SF10200	Piston Seal Ring Sizing Tool	1
*④	07JGG-001000A or 07JGG-001010A	Belt Tension Gauge	1
⑤	07MAC-SL00200	Ball Joint Remover, 28 mm	1
⑥	07NAD-SR3020A	Cylinder End Seal Remover Attachment	1
⑦	07NAG-SR3090A	Valve Seal Ring Sizing Tool	1
⑧	07RAK-S040121	P/S Joint Adaptor (Hose)	1
⑨	07VAK-P8A011A	P/S Joint Adaptor (Pump)	1
⑩	07VAK-P8A012A	P/S Joint Adaptor Plate (Pump)	1
⑪	07406-0010001 or 07406-001000A	P/S Pressure Gauge	1
⑫	07725-0030000	Universal Holder	1
⑬	07746-0010100	Attachment, 32x35 mm	1
⑭	07749-0010000	Driver	1
⑮	07916-SA50001	Locknut Wrench, 40 mm	1
⑯	07974-SA5020A or 07974-SA50200	Sleeve Seal Ring Sizing Tool	1
⑰	07974-SA50800	Ball Joint Boot Clip Guide	1

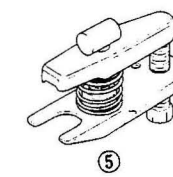
* Included in the Belt Tension Gauge Set, 07TGG-001000A.

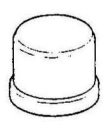

①

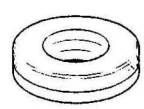

②

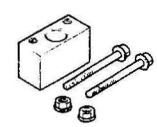

③


④

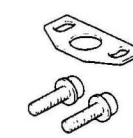

⑤

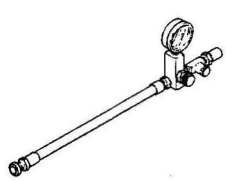

⑥


⑦

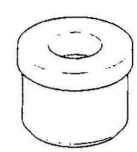

⑧

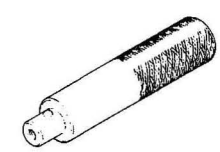

⑨

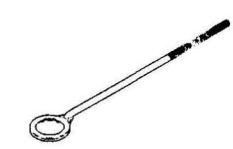

⑩

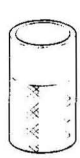

⑪


⑫


⑬


⑭


⑮


⑯

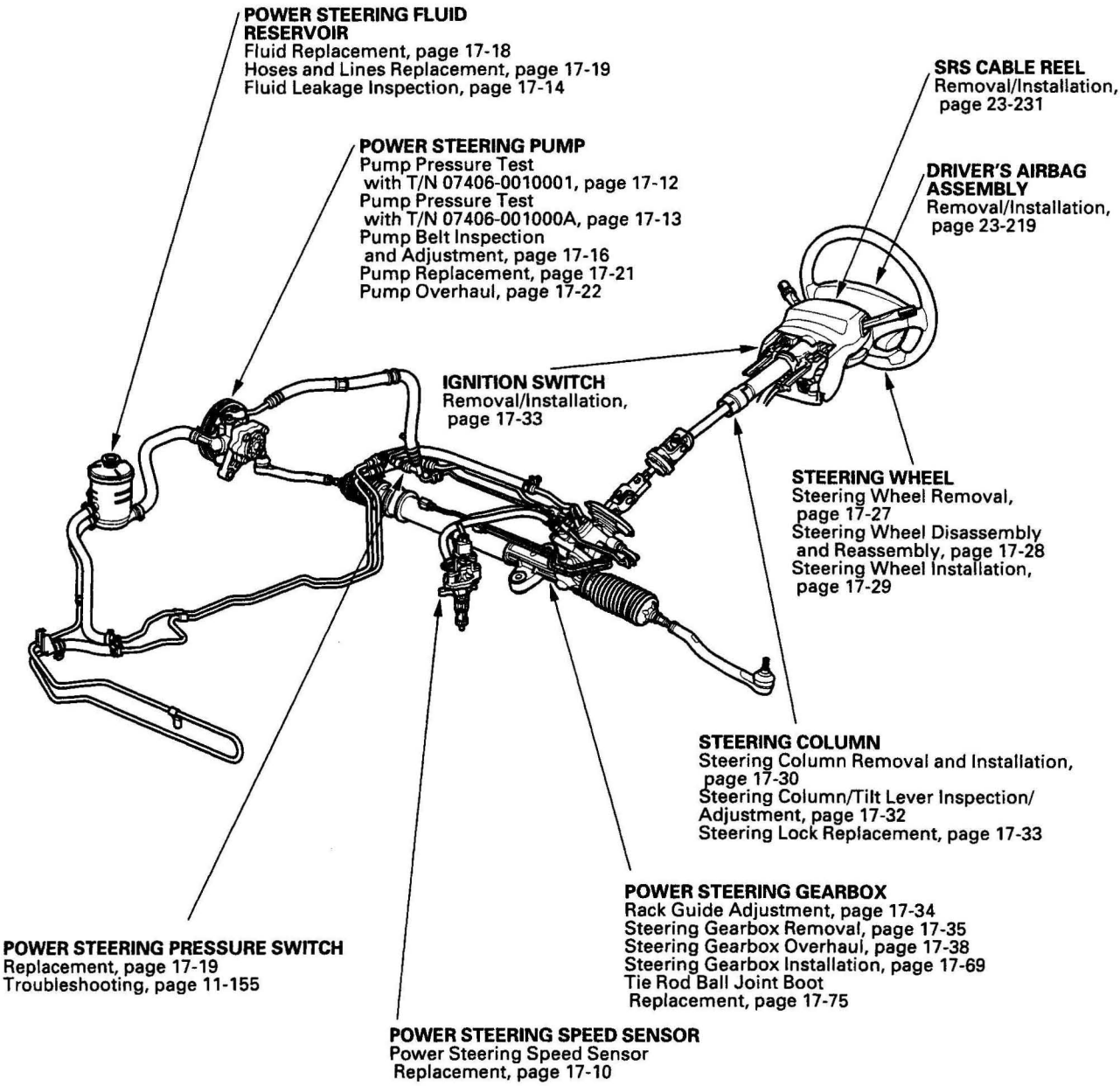

⑰

BACK

Protected by AR

Component Location Index

'99-03 Premium models:

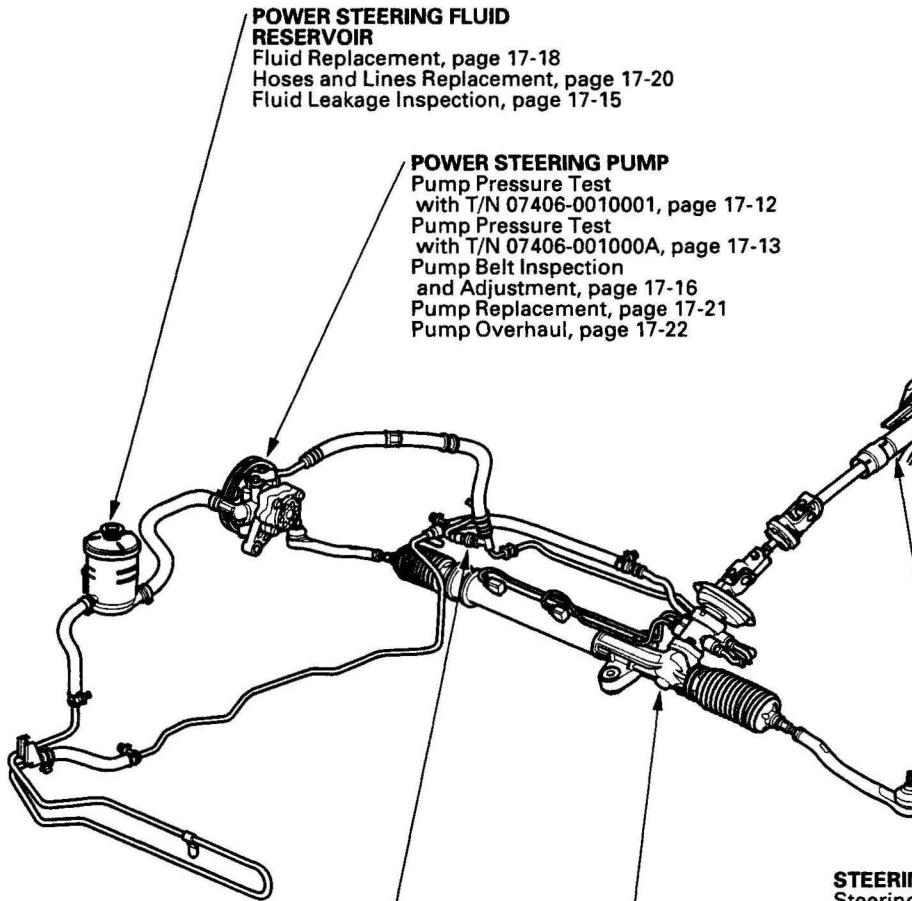


BACK

Protected by AR

Component Location Index (cont'd)

'02-03 Type-S models:



POWER STEERING FLUID RESERVOIR
Fluid Replacement, page 17-18
Hoses and Lines Replacement, page 17-20
Fluid Leakage Inspection, page 17-15

POWER STEERING PUMP
Pump Pressure Test with T/N 07406-0010001, page 17-12
Pump Pressure Test with T/N 07406-001000A, page 17-13
Pump Belt Inspection and Adjustment, page 17-16
Pump Replacement, page 17-21
Pump Overhaul, page 17-22

DRIVER'S AIRBAG ASSEMBLY
Removal, page 23-219
Installation, page 23-220

STEERING WHEEL
Steering Wheel Removal, page 17-27
Steering Wheel Disassembly and Reassembly, page 17-28
Steering Wheel Installation, page 17-29

STEERING COLUMN
Steering Column Removal and Installation, page 17-30
Steering Column/Tilt Lever Inspection/ Adjustment, page 17-32
Steering Lock Replacement, page 17-33
SRS CABLE REEL
Removal/Installation, page 23-231

POWER STEERING PRESSURE SWITCH
Replacement, page 17-20
Troubleshooting, page 11-155

POWER STEERING GEARBOX
Rack Guide Adjustment, page 17-34
Steering Gearbox Removal, page 17-35
Steering Gearbox Overhaul, page 17-54
Steering Gearbox Installation, page 17-72
Tie-Rod Ball Joint Boot Replacement, page 17-75

BACK

Protected by AR

Symptom Troubleshooting Index

Find the symptom in the chart below, and do the related procedures in the order listed until you find the cause.

Symptom	Procedure(s)	Also check for:
Hard steering	Troubleshoot the system (see page 17-7).	• Modified suspension • Tire sizes, tire varieties, and air pressure
Assist (excessively light steering at high speed)	1. Check the rack guide adjustment (see page 17-34). 2. Check the power assist at road speed (see page 17-9).	Front wheel alignment (see page 18-5).
Shock or vibration when the wheel is turned to full lock	1. Check the rack guide adjustment (see page 17-34). 2. Check the power steering pump belt for slippage and adjust as necessary (see page 17-16). 3. Replace the steering gearbox (see page 17-35).	
Steering wheel will not return smoothly	1. Check cylinder lines A and B for deformation. 2. Check wheel alignment (see page 18-5). 3. Replace the steering gearbox (see page 17-35). 4. Check the rack guide adjustment (see page 17-34).	
Uneven or rough steering	1. Check the rack guide adjustment (see page 17-34). 2. Check the power steering pump belt adjustment (see page 17-16). 3. Check for low or erratic engine idle speed (see page 11-157). 4. Check for air in the power steering system due to low fluid level. 5. Check for low fluid level in the power steering reservoir due to possible leaks in system. 6. Replace the steering gearbox (see page 17-35).	
Steering wheel kicks back during wide turns	1. Check power steering pump belt adjustment (see page 17-16). 2. Check the system fluid pressures with T/N 07406-0010001 (see page 17-12) or with T/N 07406-001000A (see page 17-13).	
Humming	1. Check when the noise occurs. • If the noise is heard 2—3 minutes after starting the engine in cold weather, this is normal. • If the noise is heard when the wheel is turn with the vehicle stopped, this is normal due to the fluid pulsation. 2. Check for the high-pressure hose touching the subframe or body. 3. Check for automatic transmission converter noise. Remove the power steering belt, and recheck.	Pump pressure
Rattle or chattering (Rack rattle)	1. Check for loose steering components (tie-rod and ball joints). Tighten or replace as necessary. 2. Check the steering column shaft for wobbling. If the steering columns wobbles, replace the steering column assembly (see page 17-30). 3. Check the rack guide adjustment (see page 17-34). 4. Check the power steering pump pulley. • If the pulley is loose, tighten it (see step 31 on page 17-26). • If the pump shaft is loose, replace the pump (see page 17-21).	

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

Symptom	Procedure(s)	Also check for:
Hissing	1. Check the fluid level. If low, fill the reservoir to the proper level and check for leaks. 2. Check the reservoir for leaks. 3. Check for crushed inlet hose or loose hose clamp allowing air into the suction side of the system. 4. Check the power steering pump shaft oil seal for leaks.	
Pump noise	1. Compare the pump noise at normal operating temperature to another alike vehicle, (pump noise up to 2-3 minutes after starting the engine in cold weather is normal). 2. Remove and inspect the pump for wear and damage (see page 17-22).	
Squeaking	Check the power steering belt tension and adjust as necessary (see page 17-16).	
Fluid leaks from the steering gearbox	1. Fluid leaks from the top of the valve body unit: Replace the valve body unit. 2. Fluid leaks from the left tie-rod boot: Replace the valve oil seal on the pinion shaft. Replace the cylinder end seal on the gearbox side. 3. Fluid leaks from the right tie-rod boot: Replace the cylinder end seal. 4. Fluid leaks from pinion shaft near the lower steering joint bolt: Replace the valve body unit.	
Fluid leaks from power steering speed sensor	1. Fluid leaks from the sensor outlet or the sensor inlet hose fittings on the vehicle speed sensor (VSS)/power steering speed sensor: Replace the hose clamps on the fittings and recheck. If it still leaks, replace the hoses (see page 17-19). 2. Fluid leaks from the sensor body mating surfaces. Replace the vehicle speed sensor (VSS)/power steering speed sensor (see page 17-10).	
Fluid leaks from lines	1. Fluid leaks from the cylinder line A or B connections (flare nuts): Tighten the connection and retest. If it still leaks, replace the fitting O-rings. 2. Fluid leaks from a damaged cylinder line A or B: Replace the cylinder line (see page 17-38). 3. Fluid leaks from the pump outlet hose or return line fitting on the valve body unit (flair nuts): Tighten the fitting and retest. If it still leaks, replace the hose, line, or valve body unit as necessary (see page 17-19).	
Fluid leaks from pump	1. Fluid leaks from the front oil seal: Replace the front oil seal. 2. Fluid leaks from the power steering pump housing: Replace the leaking O-rings or seals (see page 17-22), and if necessary replace the power steering pump (see page 17-21).	
Fluid leaks from reservoir	1. Fluid leaks from around the reservoir cap: Fluid level is too high: drain the reservoir to the proper level. 2. Fluid leaks from reservoir: Check the reservoir for cracks and replace as necessary. Aerated fluid: check for an air leak on the inlet side of pump.	
Fluid leaks from pump outlet hose (high-pressure)	1. Check the fitting for loose bolts. If the bolts are tight, replace the fitting O-ring. 2. Fluid leaks at the swagged joint: Replace the outlet hose	
Fluid leaks from pump inlet hose (low-pressure)	Check the hose for damage, deterioration, or improper assembly. Replace or repair as necessary.	

BACK

Protected by AR

Hard Steering Troubleshooting

1. Check the power assist with vehicle parked (see page 17-8).

   Is the power assist more than 25N (2.5 kgf, 5.5 lbf)?

   YES – Go to step 2.
   NO – Power assist is OK. ■

2. Measure the power assist with the sensor inlet fitting and hose plugged (see page 17-9).

   Is the power assist more than 25 N (2.5 kgf, 5.5 lbf)?

   YES – Go to step 3.
   NO – Go to step 8.

3. Measure steady-state fluid pressure from the pump at idle with T/N 07406-0010001 (see page 17-12) or with T/N 07406-001000A (see page 17-13).

   Is the pressure 1,500 kPa (15 kgf/cm², 213 psi) or less?

   YES – Go to step 4.
   NO – Go to step 9.

4. Measure the pump relief pressure at idle with T/N 07406-0010001 (see page 17-12) or with T/N 07406-001000A (see page 17-13).

   Is the pressure 7,600-8,300 kPa (78-85 kgf/cm², 1,110-1,210 psi) or less?

   YES – Go to step 5.
   NO – Go to step 10.

5. With a spring scale, measure the power assist in both directions, to the left and to the right.

   Are the 2 measurements within 5.0 N (0.51 kgf, 1.12 lbf) of each other?

   YES – Go to step 6.
   NO – Go to step 11.

6. Measure the fluid pressure with both pressure gauge valves open (if so equipped), while turning the steering wheel fully to the left and fully to the right.

   Is the pressure 7,600-8,300 kPa (78-85 kgf/cm², 1,110-1,210 psi) or less?
   YES – Go to step 7.
   NO – Faulty gearbox. ■

7. Adjust the rack guide (see page 17-34), and retest.

   Is the steering OK?

   YES – Repair is completed. ■
   NO – Faulty gearbox. ■

8. Check for fluid leaks at the hoses, lines, joints and connections.

   Are the hoses, lines, joints and connections OK?

   YES – Faulty power steering speed sensor or valve body unit. ■
   NO – Repair or replace the lines or hoses. ■

9. Check the supply and return lines between the pump and the gearbox for clogging and deformation.

   Are the lines clogged or deformed?

   YES – Repair or replace the lines. ■
   NO – Faulty valve body unit. ■

10. Check the flow control valve (see page 17-22) for smooth movement and leaks.

    Is the flow control valve OK?

    YES – Faulty pump assembly. ■
    NO – Faulty flow control valve. ■

11. Check the cylinder lines A and B for deformation.

    Are the A or B lines deformed?

    YES – Replace the lines. ■
    NO – Go to step 12.

12. Check for a bent rack shaft or misadjusted rack guide (too tight).

    Is the rack shaft bent or the rack guide adjusted too tight?

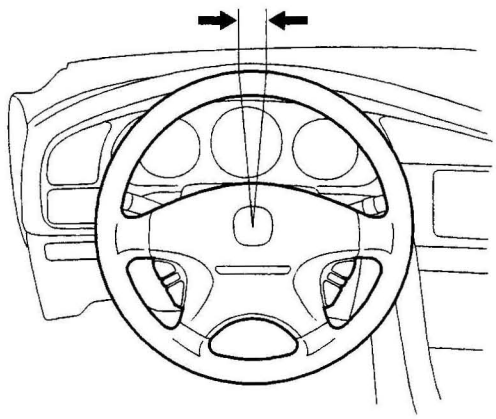
    YES – Replace the rack shaft or readjust the rack guide. ■
    NO – Faulty valve body unit. ■

Protected by AR

Steering Wheel Rotational Play Check

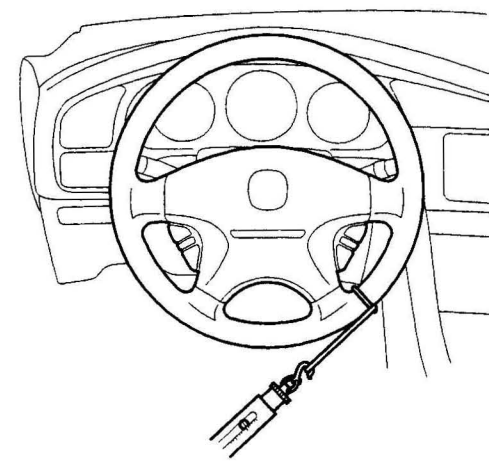
1. Turn the front wheels to the straight ahead position.
2. Measure how far you can turn the steering wheel left and light without moving the front wheels.
   - If the play is within the limit, the gearbox and linkages are OK.
   - If the play exceeds the limit, adjust the rack guide (see page 17-34). If the play is still excessive after rack guide adjustment, inspect the steering linkage and gearbox (see page 17-11).

ROTATIONAL PLAY: 0—10 mm (0—0.39 in.)



Power Assist Check With Vehicle Parked

1. Check the power steering fluid level (see page 17-18) and pump belt tension (see page 17-16).
2. Start the engine, let it idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Attach a commercially available spring scale to the steering wheel. With the engine idling and the vehicle on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.
   - If the scale reads no more than 25 N (2.5 kgf, 5.5 lbf) the gearbox and pump are OK.
   - If the scale reads more than 25 N (2.5 kgf, 5.5 lbf), go on step 4.

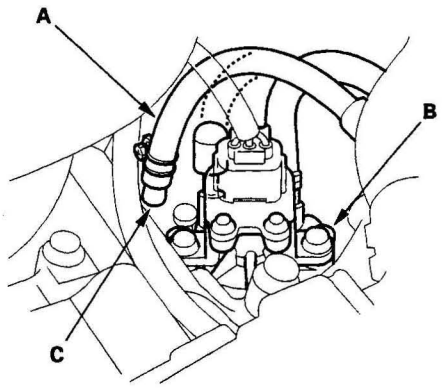


BACK

Protected by AR

Power Assist Check at Road Speed

4. Stop the engine. Disconnect the sensor inlet hose (A) from the power steering speed sensor (B), and plug (C) the hose and sensor fitting. (The VSS connector is only on vehicles equipped with the navigation system).



5. Start the engine, and let it idle.

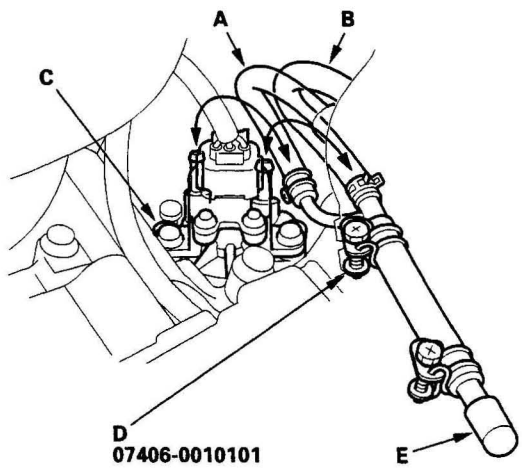
   - If the scale reads still more than 25 N (2.5 kgf, 5.5 lbf) the power steering speed sensor is OK.

   The problem maybe the pump or gearbox.

   - Measure the pump pressure with T/N 07406-0010001 (see page 17-12) or with T/N 07406-001000A (see page 17-13).
   - Check the rack guide adjustment (see page 17-34).
   - If the scale reads 25 N (2.5 kgf, 5.5 lbf) or less, check for fluid leaks at the speed sensor inlet hose. If there are no leaks in the hose, the power steering speed sensor is leaking internally. Replace the speed sensor (see page 17-10).

Special Tools Required
Bypass tube joint 07406-0010101 (Included with 07406-0010001 or 07406-001000A)

1. Check the power steering fluid level (see page 17-18) and pump belt tension (see page 17-16).
2. Start the engine, let it idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Stop the engine, to simulate speeds above 62 mph (100 km/h), disconnect the sensor inlet hose (A) and sensor outlet hose (B) from the power steering speed sensor (C), and connect them to the bypass tube joint (D). Plug (E) the end of the bypass tube joint (The vehicle speed pulse connector is only on vehicles equipped with the navigation system).



(cont'd)

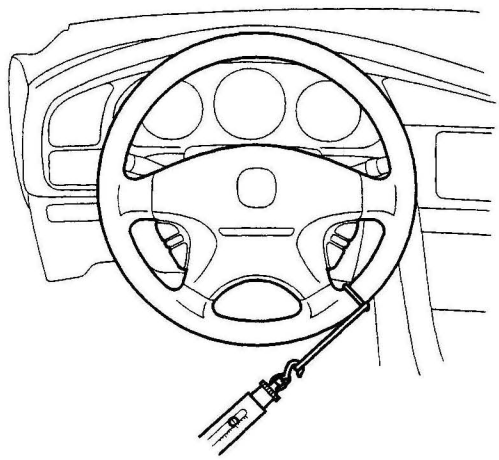
Protected by AR

Power Assist Check at Road Speed (cont'd)

4. Attach a comercially available spring scale to the steering wheel. Start the engine, with the idling and vehicle on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.

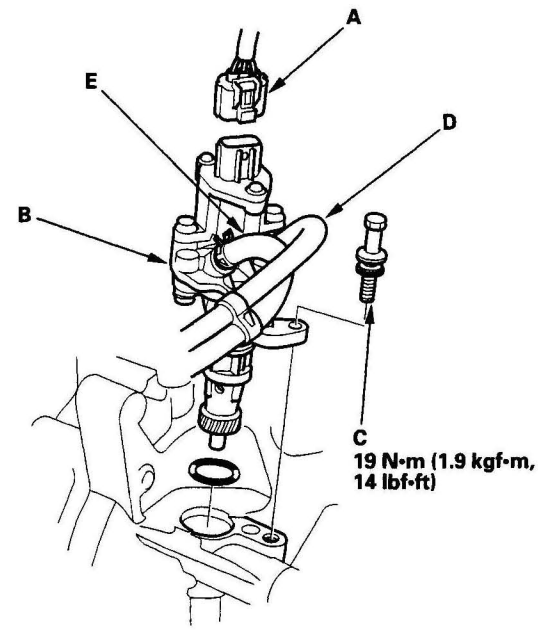
   - If the scale reads more than 25 N (2.5 kgf, 5.5 lbf) the valve body unit is OK. The problem is in the power steering speed sensor, replace it (see page 17-10). and road test.

   - If the scale reads 25 N (2.5 kgf, 5.5 lbf) or less, problem is in the pump. Check the pump pressure with T/N 07406-0010001 (see page 17-12), or with T/N 07406-001000A (see page 17-13).



Power Steering Speed Sensor Replacement

1. On vehicles equipped with the navigation system, disconnect the VSS connector (A) from the power steering speed sensor (B). Remove the sensor mounting bolt (C), and remove the power steering speed sensor.



2. Disconnect the sensor inlet hose (D) and sensor outlet hose (E), and plug the hose ends.

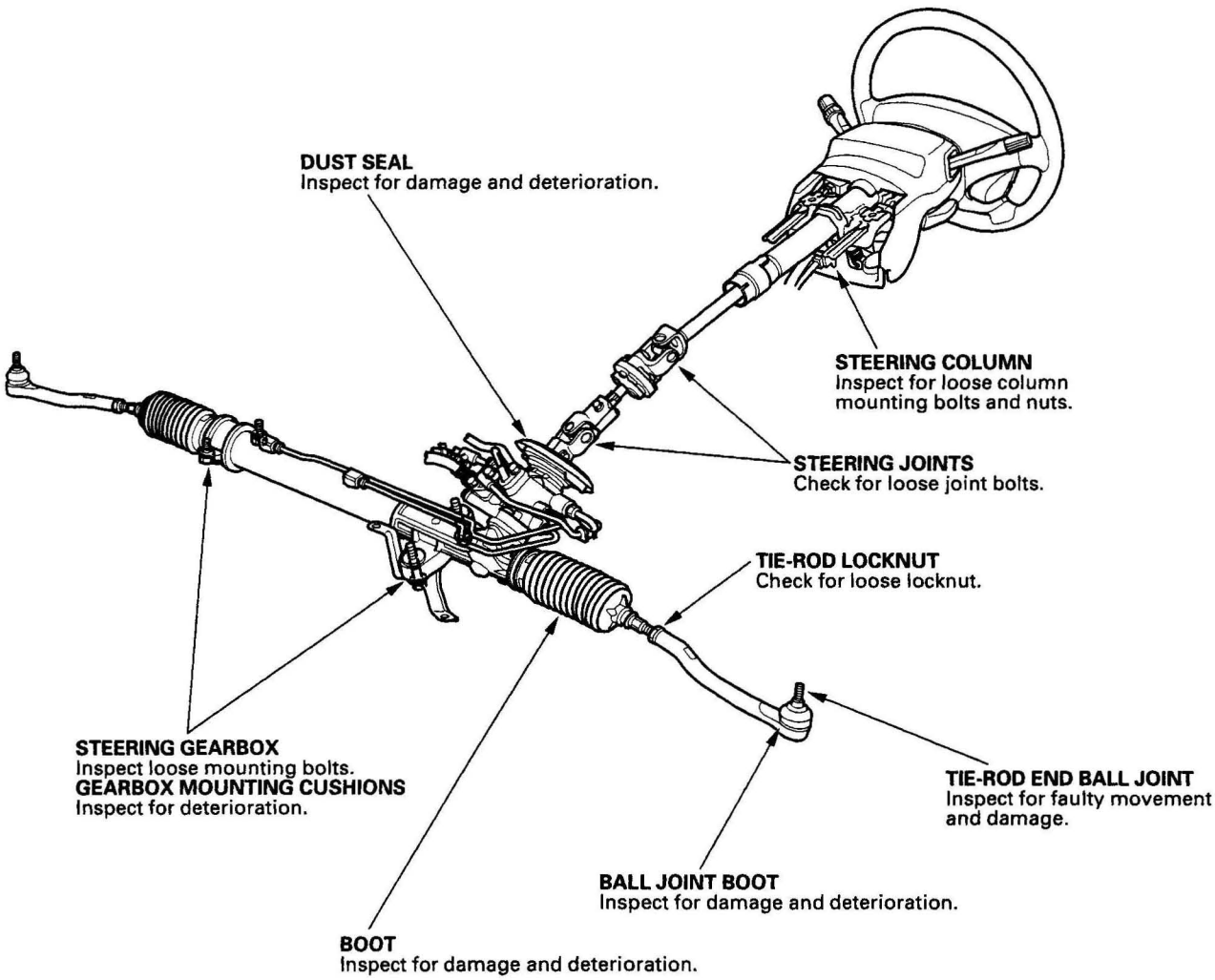
3. Install the power steering speed sensor in the reverse order of removal, and note these items;

   - Fill the reservoir to the upper level line (see page 17-18).
   - Start the engine and run it at first idle, then turn the steering wheel lock-to-lock several times to bleed air from the system.

BACK

Protected by AR

Steering Linkage and Gearbox Inspection



BACK

Protected by AR

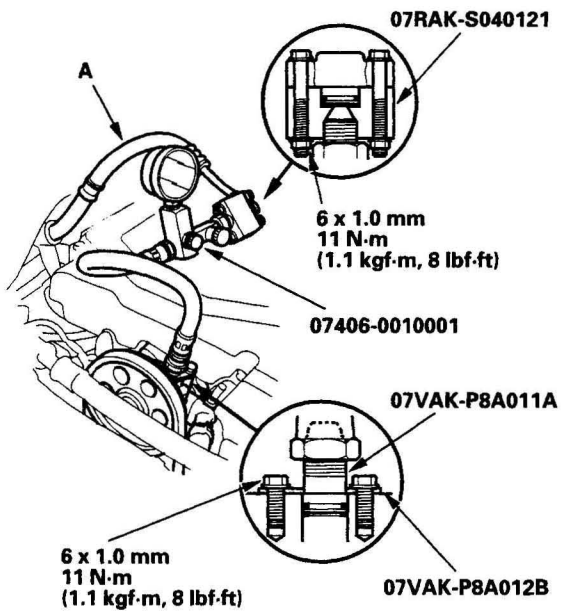
Pump Pressure Test with T/N 07406-0010001

Special Tools Required
- P/S joint adapter (pump) 07VAK-P8A011A
- P/S joint adapter plate (pump) 07VAK-P8A012B
- P/S joint adapter (hose) 07RAK-S040121
- P/S pressure gauge 07406-0010001

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (see page 17-18) and pump belt tension (see page 17-16).

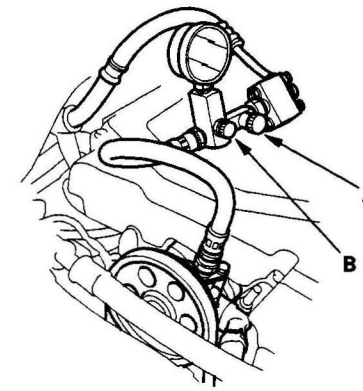
2. Disconnect the pump outlet hose (A) from the pump outlet with care so as not to spill the power steering fluid on the frame and other parts, Install the P/S joint adapter (pump) on the pump outlet (B) with the P/S joint outlet plate.



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose (A) to the P/S joint adapter (hose).

4. Install the P/S pressure gauge to the P/S joint adapter (pump).

5. Fully open the shut-off valve (A).



6. Fully open the pressure control valve (B).

7. Start the engine and let it idle.

8. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.

9. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the gauge should read less than 1,500 kPa (15 kgf/cm², 213 psi). If it reads high, check for:

   - Clogged or deformed feed or return line between the pump and gearbox.
   - Clogged valve body unit.

10. Close the pressure control valve, then close the shut-off valve gradually until the pressure gauge needle is stable. Read the pressure.

NOTICE
Do not keep the pressure control valve closed more than 5 seconds or the pump could be damaged by over-heating.

11. Immediately open the pressure control valve fully. If the pump is in good condition, the gauge should read at least 7,600−8,300 kPa (78−85 kgf/cm², 1,110−1,210 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.

BACK

Protected by AR

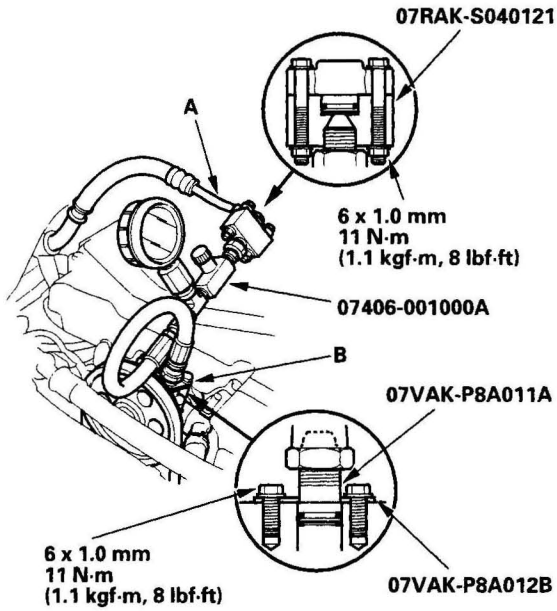
Pump Pressure Test with T/N 07406-001000A

Special Tools Required
- P/S joint adapter (pump) 07VAK-P8A011A
- P/S joint adapter plate (pump) 07VAK-P8A012B
- P/S joint adapter (hose) 07RAK-S040121
- P/S pressure gauge 07406-001000A

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (see page 17-18) and pump belt tension (see page 17-16).

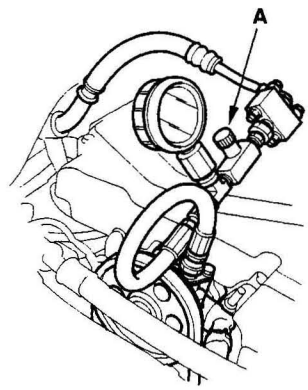
2. Disconnect the pump outlet hose (A) from the pump outlet with care so as not to spill the power steering fluid on the frame and other parts, Install the P/S joint adapter (pump) on the pump outlet (B) with the P/S joint outlet plate.



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose (A) to the P/S joint adapter (hose).

4. Install the P/S pressure gauge to the P/S joint adapter (pump).

5. Open the pressure control valve (A) fully.



6. Start the engine and let it idle.

7. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.

8. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the gauge should read less than 1,500 kPa (15 kgf/cm², 213 psi). If it reads high, check for:

   - Clogged or deformed feed or return line between the pump and gearbox.
   - Clogged valve body unit.

9. Close the pressure control valve gradually and read the pressure.

   NOTICE
   Do not keep the pressure control valve closed more than 5 seconds or the pump could be damaged by over-heating.

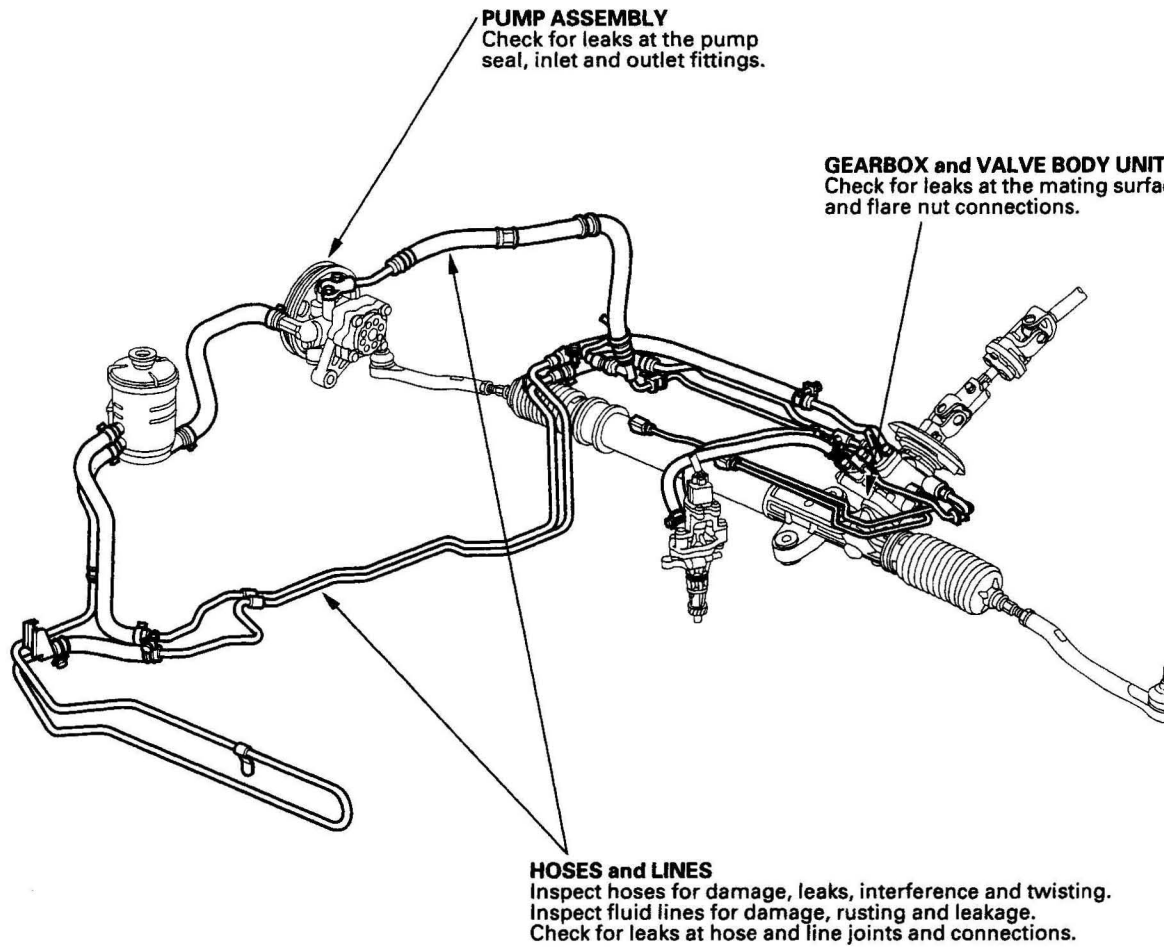
10. Immediately open the pressure control valve fully. If the pump is in good condition, the gauge should read at least 7,600−8,300 kPa (78−85 kgf/cm², 1,110−1,210 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.

BACK

Protected by AR

Fluid Leakage Inspection

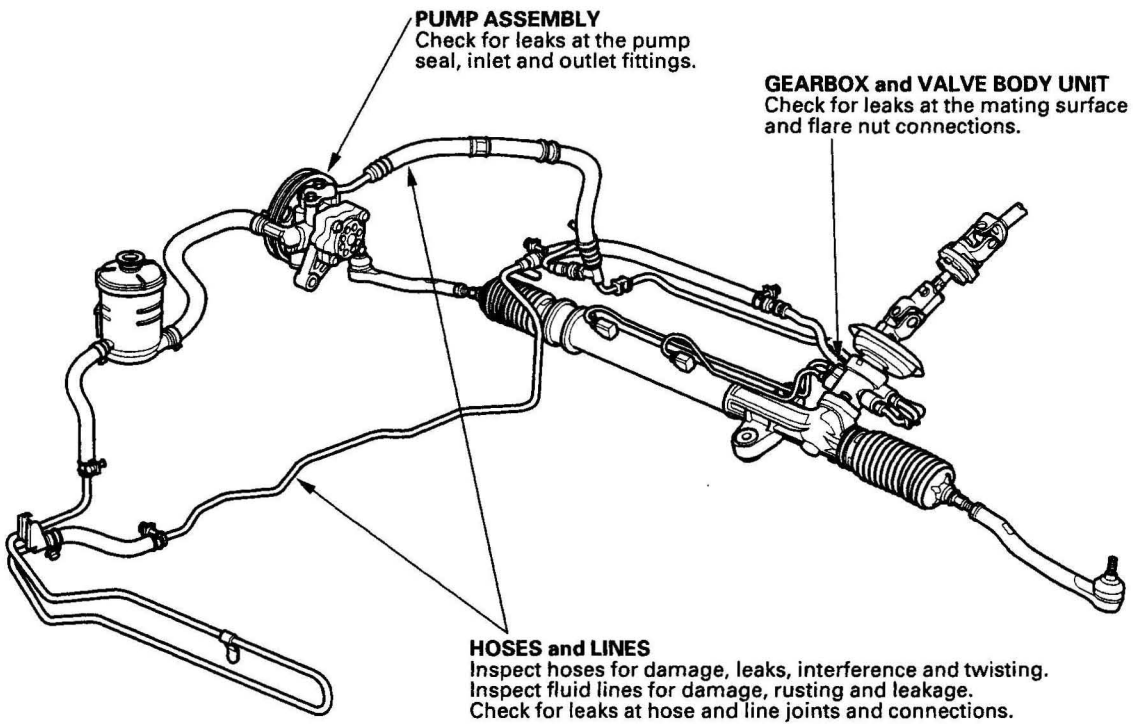
'99-03 Premium models:



BACK

Protected by AR

'02-03 Type-S models:



Protected by AR

Pump Belt Inspection and Adjustment

Special Tools Required
Belt tension gauge set 07JGG-001000A or Belt tension gauge 07JGG-001010A

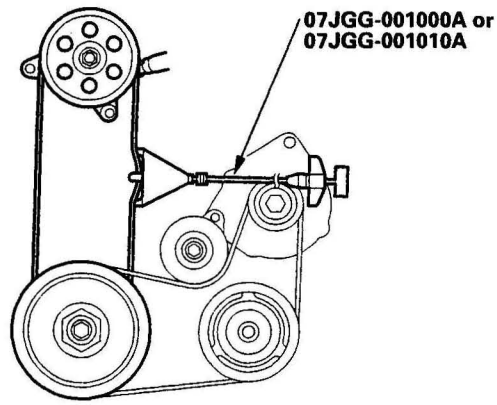
Belt tension gauge method

Inspection

1. Attach the belt tension gauge to the belt with the gauge face toward the engine, and measure the tension of the belt. Follow the manufacturer's instructions. If the belt is worn or damaged, replace it.

   NOTE: Remove the belt tension gauge carefully to avoid hitting the gauge reset lever.

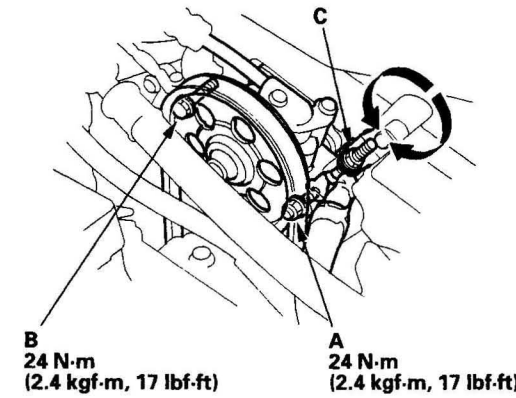
   Tension:
   Used Belt: 390–540 N (40–55 kgf, 88–121 lbf)
   New Belt: 740–880 N (75–90 kgf, 165–198 lbf)



2. If you installed a new belt, run the engine for 5 minutes, then readjust the belt to the used belt specifications.

Adjustment

3. Loosen the power steering pump mounting nut (A) and bolt (B).



4. Turn the adjusting nut (C) to get the proper belt tension, then retighten the mounting nut and bolt.

5. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the tension of the belt.

BACK

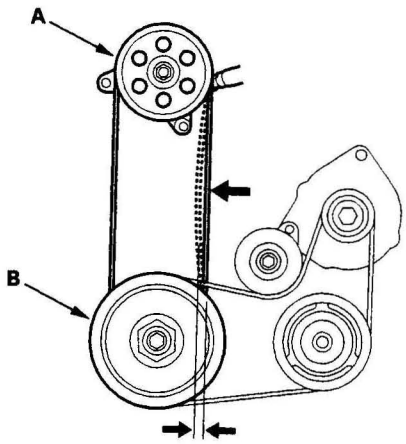
Protected by AR

Deflection Method

Inspection

1. Apply a force of 98 N (10 kgf, 22 lbf) and measure the deflection between the power steering pump pulley (A) and the crankshaft pulley (B).

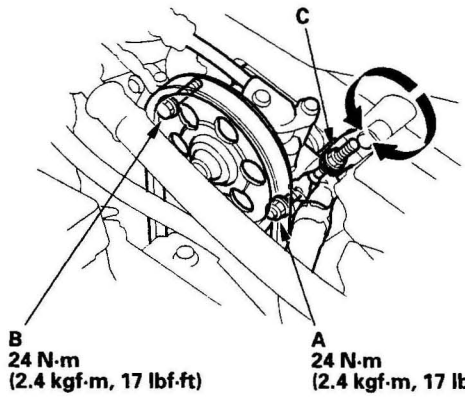
Deflection:
Used Belt: 13.0–16.5 mm (0.51–0.65 in.)
New Belt: 8.5–11.0 mm (0.33–0.43 in.)



2. If you installed a new belt, run the engine for 5 minutes, then readjust the belt to the used belt specifications.

Adjustment

3. Loosen the power steering pump mounting nut (A) and bolt (B).



4. Turn the adjusting nut (C) to get the proper belt tension, then retighten the mounting nut and bolt.

5. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the tension of the belt.

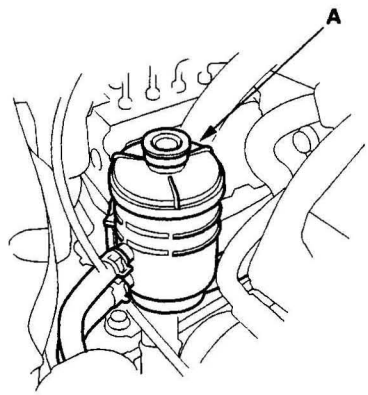
BACK

Protected by AR

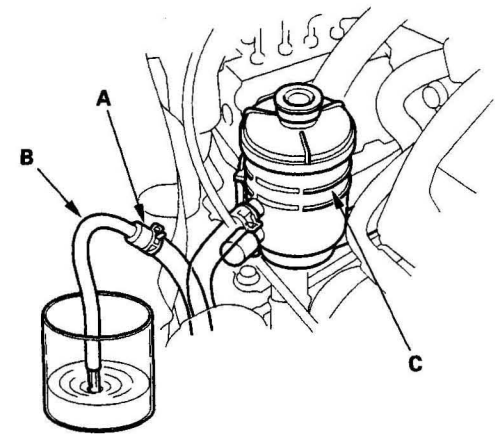
Fluid Replacement

Check the reservoir (A) at regular intervals, and add the recommended fluid as necessary. Always use Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.

SYSTEM CAPACITY:
1.1 ℓ (1.16 US. qt) at disassembly
RESERVOIR CAPACITY:
0.4 ℓ (0.42 US. qt)



1. Raise the reservoir, then disconnect the return hose (A) to drain the reservoir. Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.



2. Connect a hose (B) of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.
3. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut off the engine. Discard the fluid.
4. Reinstall the return hose on the reservoir.
5. Fill the reservoir to the upper level line (C).
6. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
7. Recheck the fluid level and add more if necessary. Do not fill the reservoir beyond the upper level line.

BACK

Protected by AR

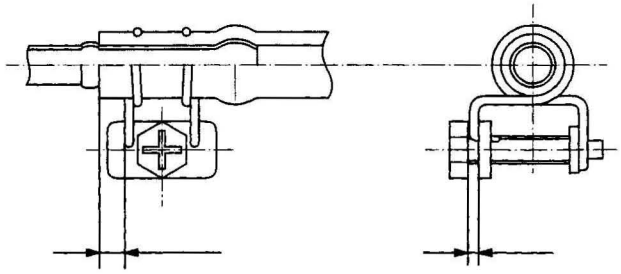
Hoses, Lines, and Pressure Switch Replacement

'99-03 Premium models:

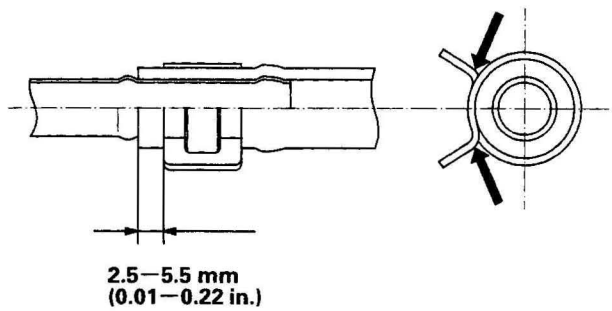
Note these items during installation:

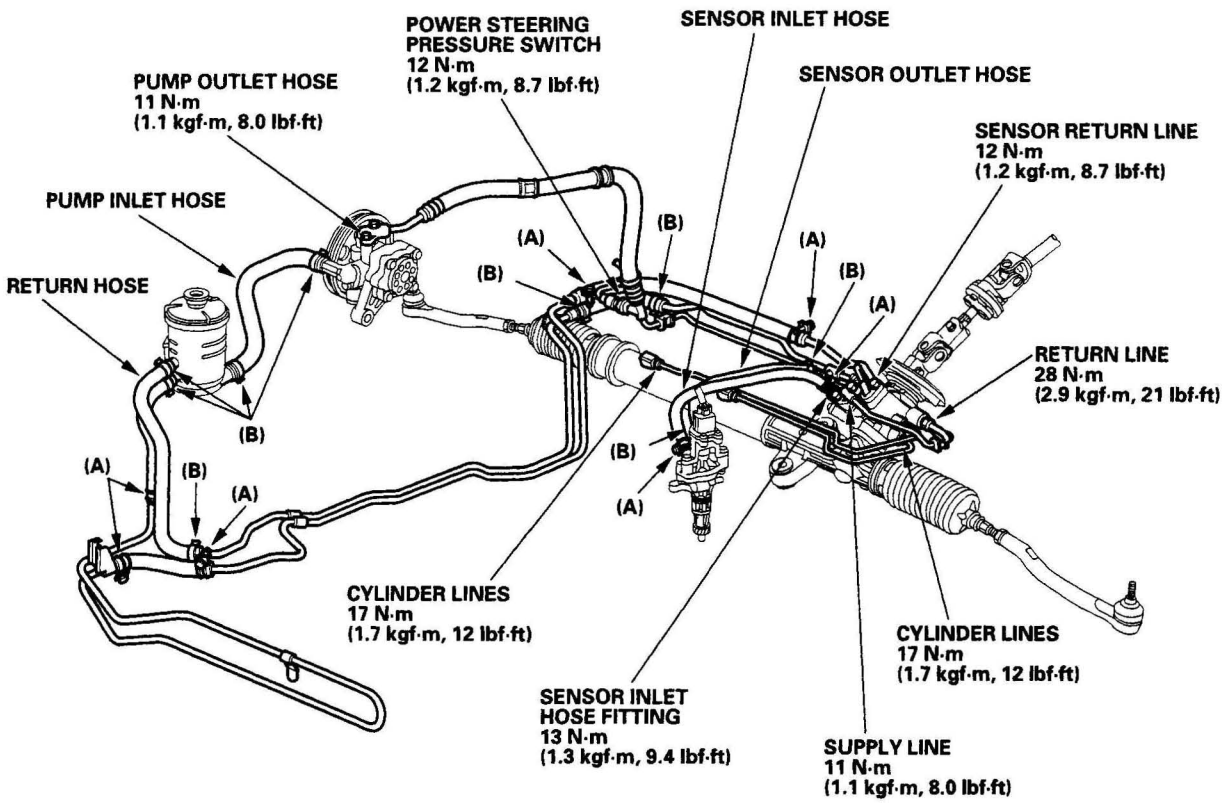
- Connect each hose to the corresponding line securely until it contacts the stop on the line. Install the clamp or adjustable clamp at the specified distance from the hose end as shown.
- Check all clamps for deterioration or deformation; replace with the clamps new ones if necessary.
- Add the recommended power steering fluid to the specified level on the reservoir and check for leaks.

ADJUSTABLE HOSE CLAMP (A)



HOSE CLAMP (B)





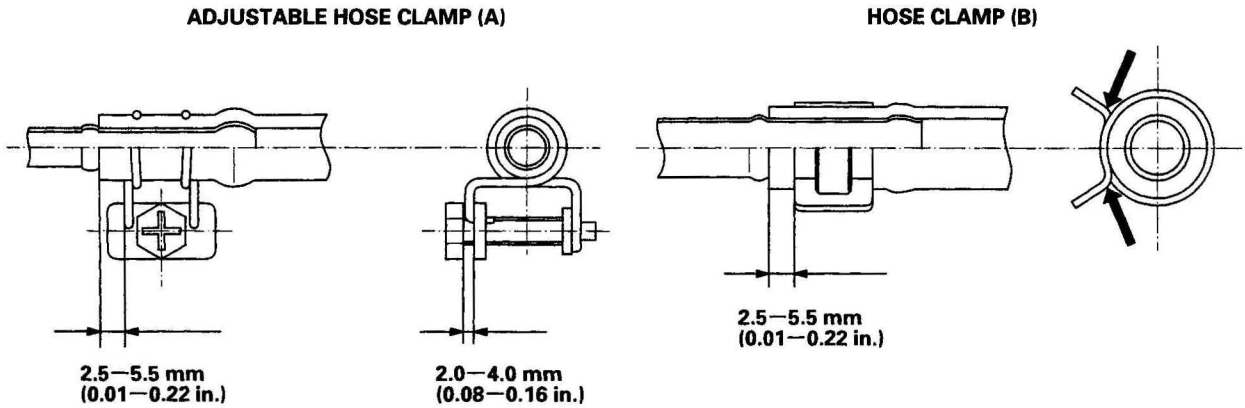
BACK

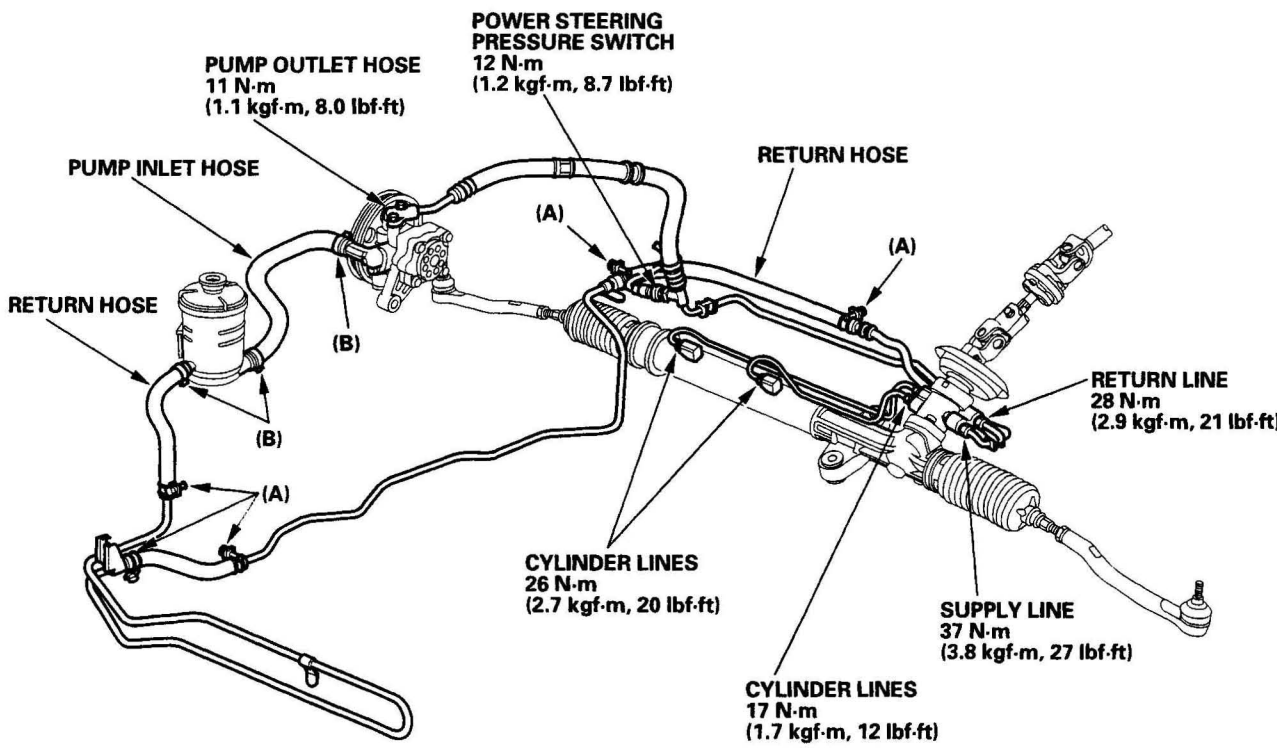
Protected by AR

Hoses, Lines, and Pressure Switch Replacement (cont'd)

'02-03 Type-S models:

Note these items during installation:
- Connect each hose to the corresponding line securely until it contacts the stop on the line. Install the clamp or adjustable clamp at the specified distance from the hose end as shown.
- Check all clamps for deterioration or deformation; replace with the clamps new ones if necessary.
- Add the recommended power steering fluid to the specified level on the reservoir and check for leaks.



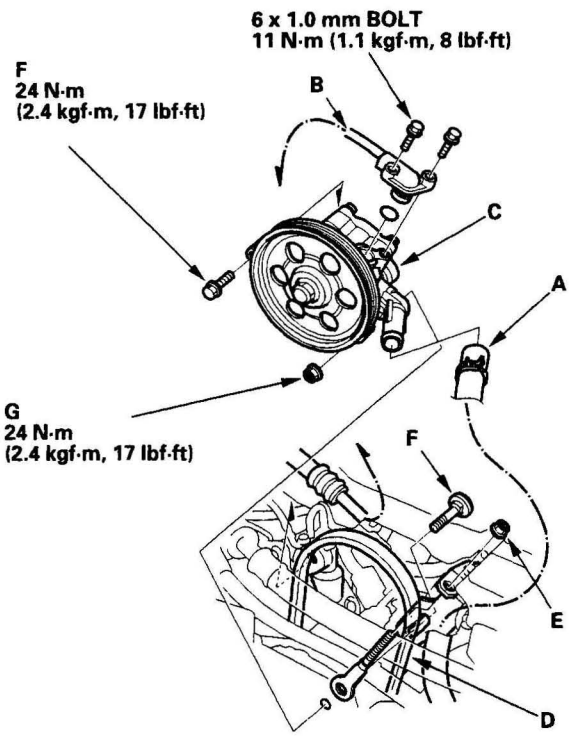


BACK

Protected by AR

Pump Replacement

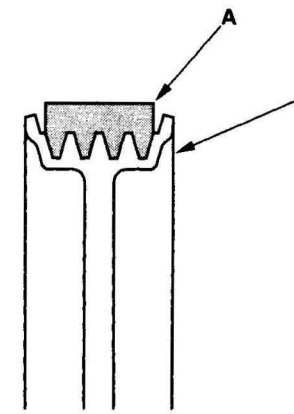
1. Place a suitable container under the vehicle.
2. Drain the power steering fluid from the reservoir.
3. Cover the crankshaft pulley with several shop towels to protect if from spilled power steering fluid. Disconnect the pump inlet hose (A) and pump outlet hose (B) from the pump (C), and plug them. Take care not to spill the fluid on the body or parts. Wipe off any spilled fluid at once.



4. Remove the belt (D) by loosening the pump adjusting nut (E), then remove pump mounting bolts (F), nut (G) and pump. Do not turn the steering wheel with pump removed.
5. Connect the pump outlet hose and inlet hose to the pump. Tighten the pump fittings securely.
6. Loosely install the pump in the pump bracket with the mounting bolts and nut.
7. Install the pump belt (A) on the pulley (B).

   Note these items during belt installation:

   - Make sure that the power steering belt is properly positioned on the pulleys.
   - Do not get the power steering fluid or grease on the belt or pulley faces. Clean off any fluid or grease before installation.



8. Adjust the pump belt adjustment (see page 17-16).
9. Fill the reservoir to the upper level line (see page 17-18).

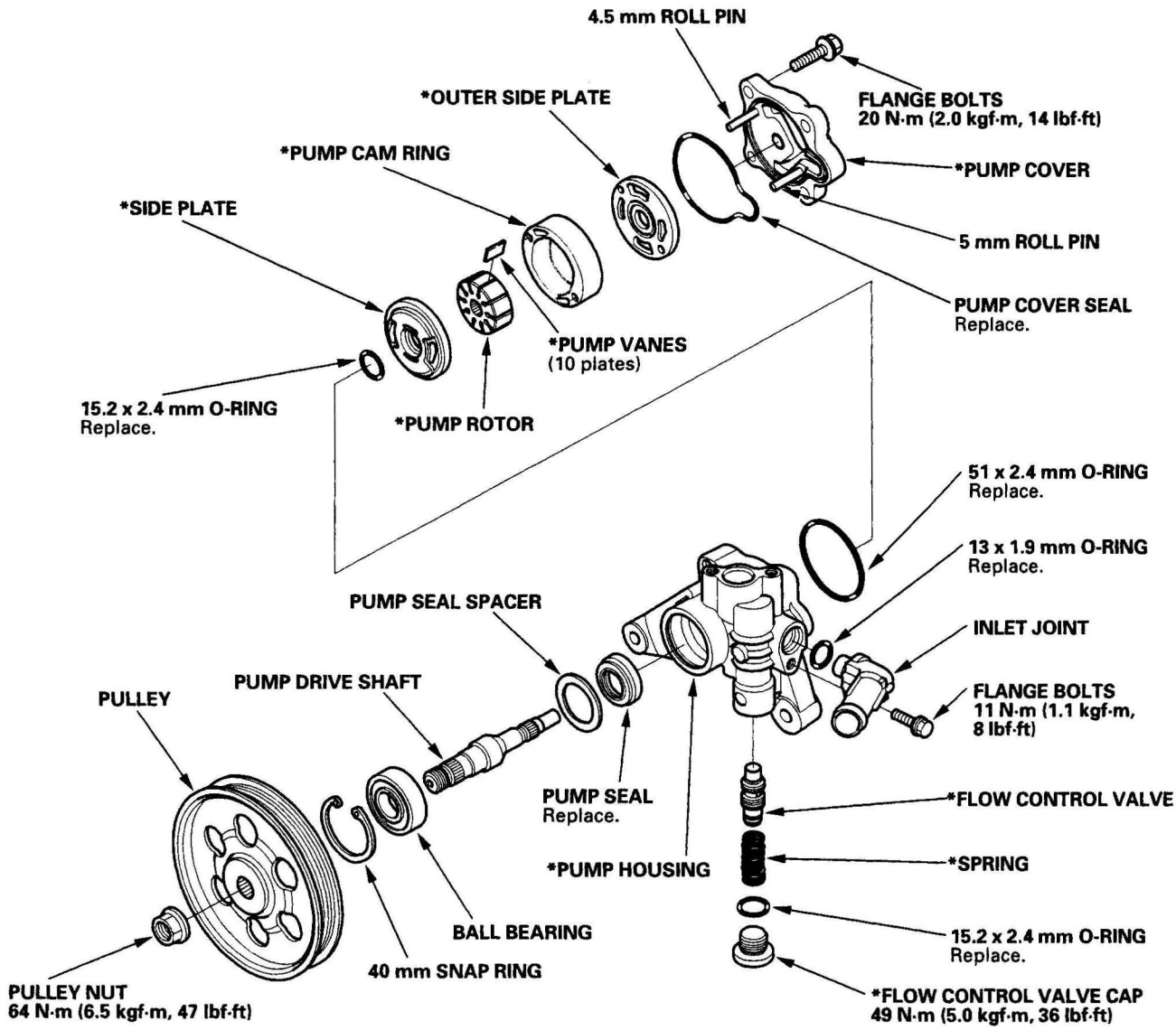
BACK

Protected by AR

Pump Overhaul

Exploded View

Replace the pump as an assembly if the parts indicated with asterisk (*) are worn of damaged.



BACK

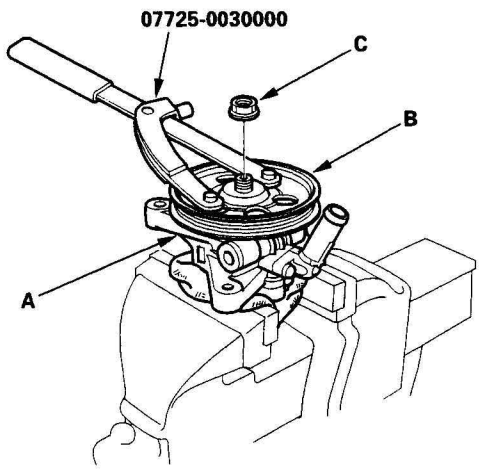
Protected by AR

Special Tools Required
Universal holder 07725-0030000

Disassembly

NOTE: Refer to the Exploded View as needed during the following procedure.

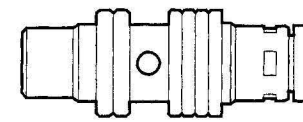
1. Remove the power steering pump (see page 17-21).
2. Drain the fluid from the pump.
3. Hold the steering pump (A) in a vise with soft jaws, hold the pulley (B) with the special tool, and remove the pulley nut (C) and pulley. Be careful not to damage the pump housing with the jaws of the vise.



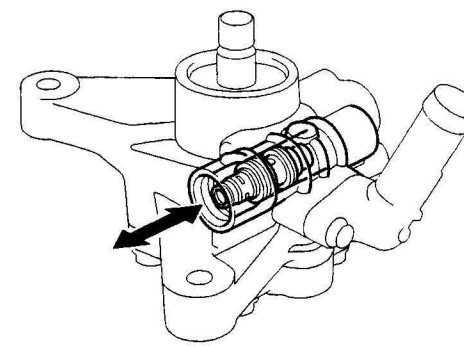
4. Loosen the flow control valve cap with a hex wrench, and remove it and the O-ring, flow control valve and spring.
5. Remove the pump cover and pump cover seal.
6. Remove the outer side plate, pump cam ring, pump rotor, pump vanes, side plate and O-rings.
7. Remove the snap ring, then remove the pump drive shaft by tapping the shaft end with the plastic hammer.
8. Remove the pump seal spacer and pump seal.

Inspection

9. Check the flow control valve for wear, burrs, and other damage to the edges of the grooves in the valve.



10. Inspect the bore of the flow control valve on the pump housing for scratches and wear.
11. Slip the flow control valve back in the pump housing, and check that it moves in and out smoothly. If OK, go to step 12; if not, replace the pump as an assembly. The flow control valve is not available separately.



(cont'd)

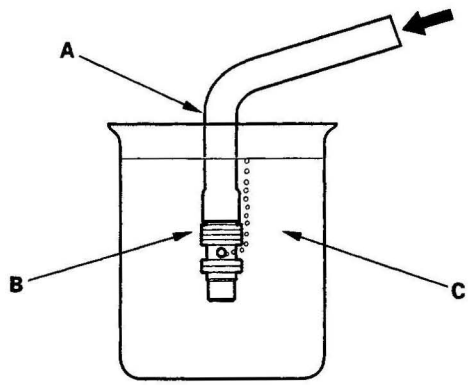
BACK

Protected by AR

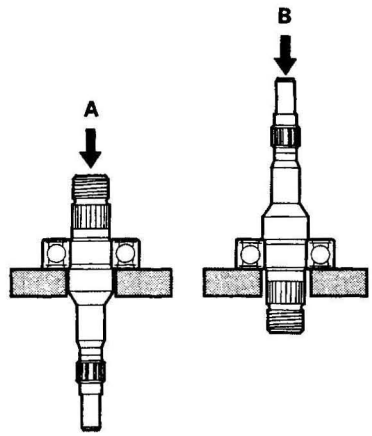
Pump Overhaul (cont'd)

12. Attach a hose (A) to the end of the flow control valve (B) as shown. Then submerge the flow control valve in a container of power steering fluid or solvent (C), and blow in the hose.

    - If air bubbles leak through the valve at less than 98 kPa (1.0 kgf/cm², 14.2 psi), replace the pump as an assembly. The flow control valve is not available separately.
    - If the flow control valve tests OK, set it aside for reassembly later.



13. Inspect the ball bearing by rotating the outer race slowly. If you feel any play (axial or radial) or roughness remove the faulty ball bearing (A), and install a new one (B).

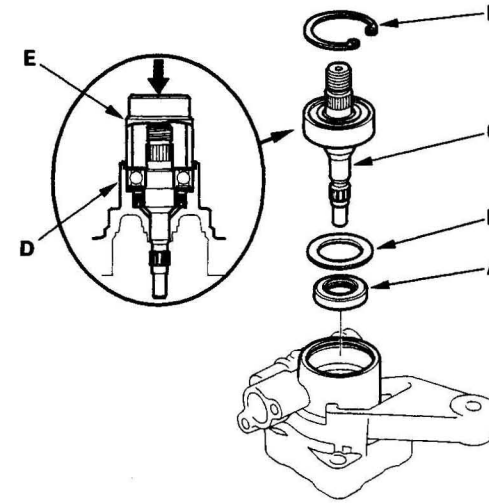


14. Inspect each part shown with an asterisk in the Exploded View; if any of them are worn or damaged, replace the pump as an assembly.

Reassembly

15. Clean the disassembled parts with solvent, and dry them with compressed air. Do not dip rubber parts in solvent.

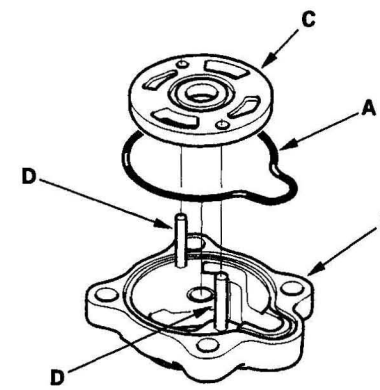
16. Install the new pump seal (A)(with its grooved side facing in) into the pump housing by hand, then install the pump seal spacer (B).



17. Position the pump drive shaft (C) in the pump housing (D), then drive it in using a socket (E).

18. Install the 40 mm snap ring (F) with its radiused side facing out.

19. Coat the new pump cover seal (A) with power steering fluid, and install it into the groove in the pump cover (B).

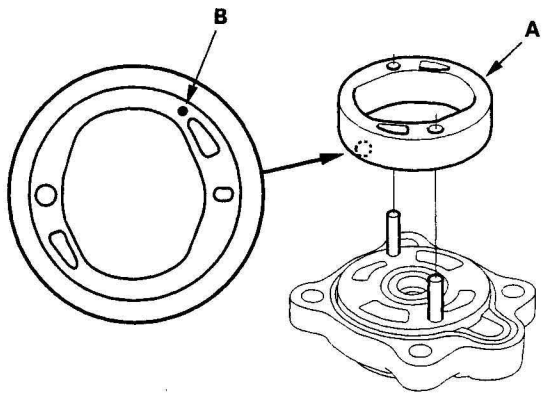


20. Install the outer side plate (C) over the 2 roll pins (D).

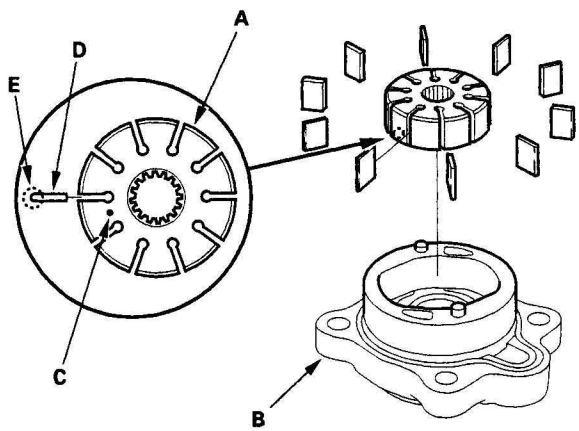
BACK

Protected by AR

21. Set the pump cam ring (A) over the 2 roll pins with its "•" mark (B) facing downward.

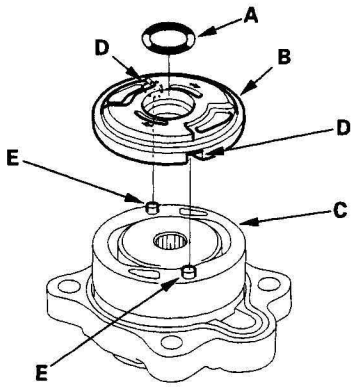


22. Assemble pump rotor (A) pump cover (B) with its "•" mark (C) facing downward.



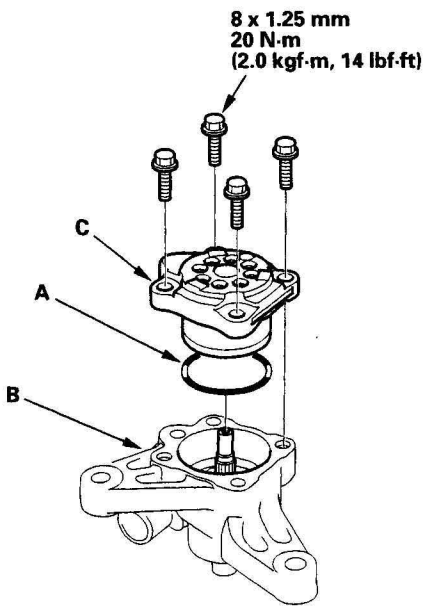
23. Set the 10 vanes (D) in the grooves in the rotor. Make sure that the round ends (E) of the vanes are in contact with the sliding surface of the cam ring.

24. Coat the new O-ring (A) with power steering fluid, and install it into the groove in the side plate (B).



25. Install the side plate on the cam ring (C) by aligning the roll pins set holes (D) in the side plate with the roll pins (E).

26. Coat the new O-ring (A) with power steering fluid, and position it in the bottom of the pump housing (B).



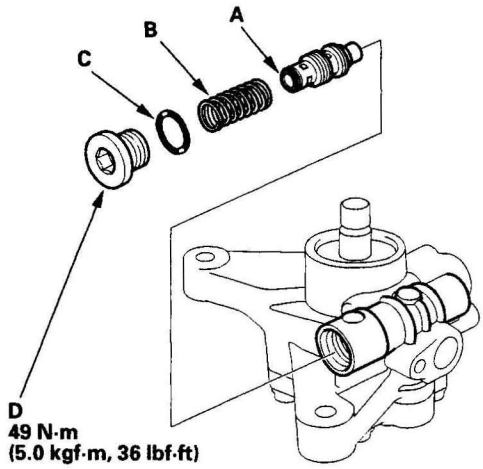
27. Install the pump cover assembly (C) in the pump housing.

(cont'd)

Protected by AR

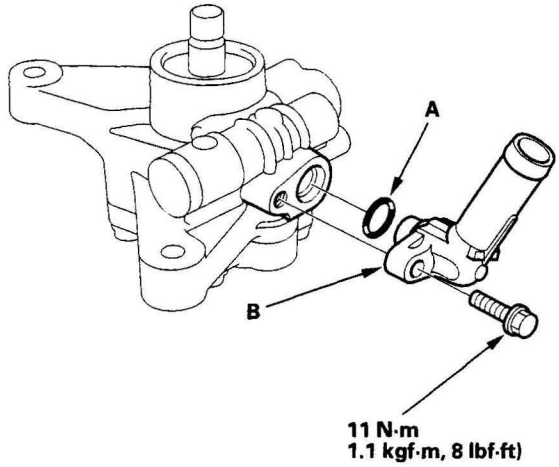
Pump Overhaul (cont'd)

28. Coat the flow control valve (A) with power steering fluid, then install it and the spring (B) in the pump housing.

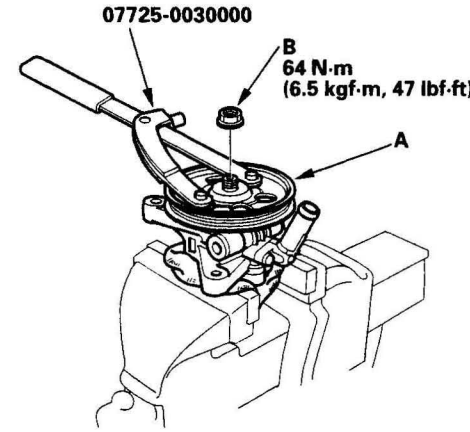


29. Coat the new O-ring (C) with power steering fluid, and install it on the flow control valve cap (D), then install the cap on the pump housing, and tighten it.

30. Coat the new O-ring (A) with power steering fluid, and install it on the inlet joint (B). Install the inlet joint on the pump housing, and tighten the flange bolt.



31. Install the pulley (A), then loosely install the pulley nut (B). Hold the steering pump in a vise with soft jaws. Be careful not to damage the pump housing with the jaws of the vise.



32. Hold the pulley with the special tool, and tighten the pulley nut.

33. Check that the pump turns smoothly by turning the pulley by hand.

BACK

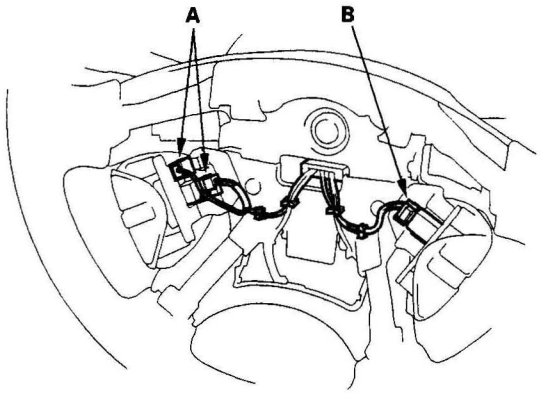
Protected by AR

Steering Wheel Removal

SRS components are located in this area. Review the SRS component locations (see page 23-14), precautions (see page 23-17), and procedures in the SRS section before performing repairs or service.

1. Align the front wheels straight ahead, then remove the driver's airbag assembly from the steering wheel (see page 23-219).

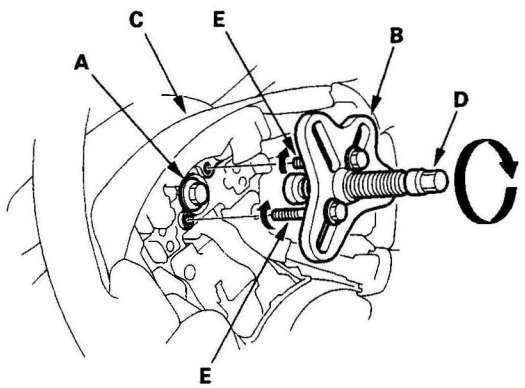
2. Disconnect the radio remote switch connectors (A) and cruise control switch connector (B).



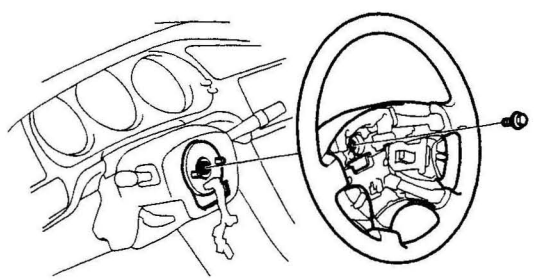
3. Loosen the steering wheel bolt (A), and install a steering wheel puller (B) on the steering wheel (C). Free the steering wheel from the steering column shaft by turning the pressure bolt (D) of the puller.

   Note these items when removing the steering wheel:

   - Do not tap on the steering wheel or the steering column shaft when removing the steering wheel.
   - If you thread the puller bolts (E) into the wheel hub more than 5 threads, the bolts will hit the cable reel and damage it. To prevent this, install a pair of jam nuts 5 threads up on each puller bolt.



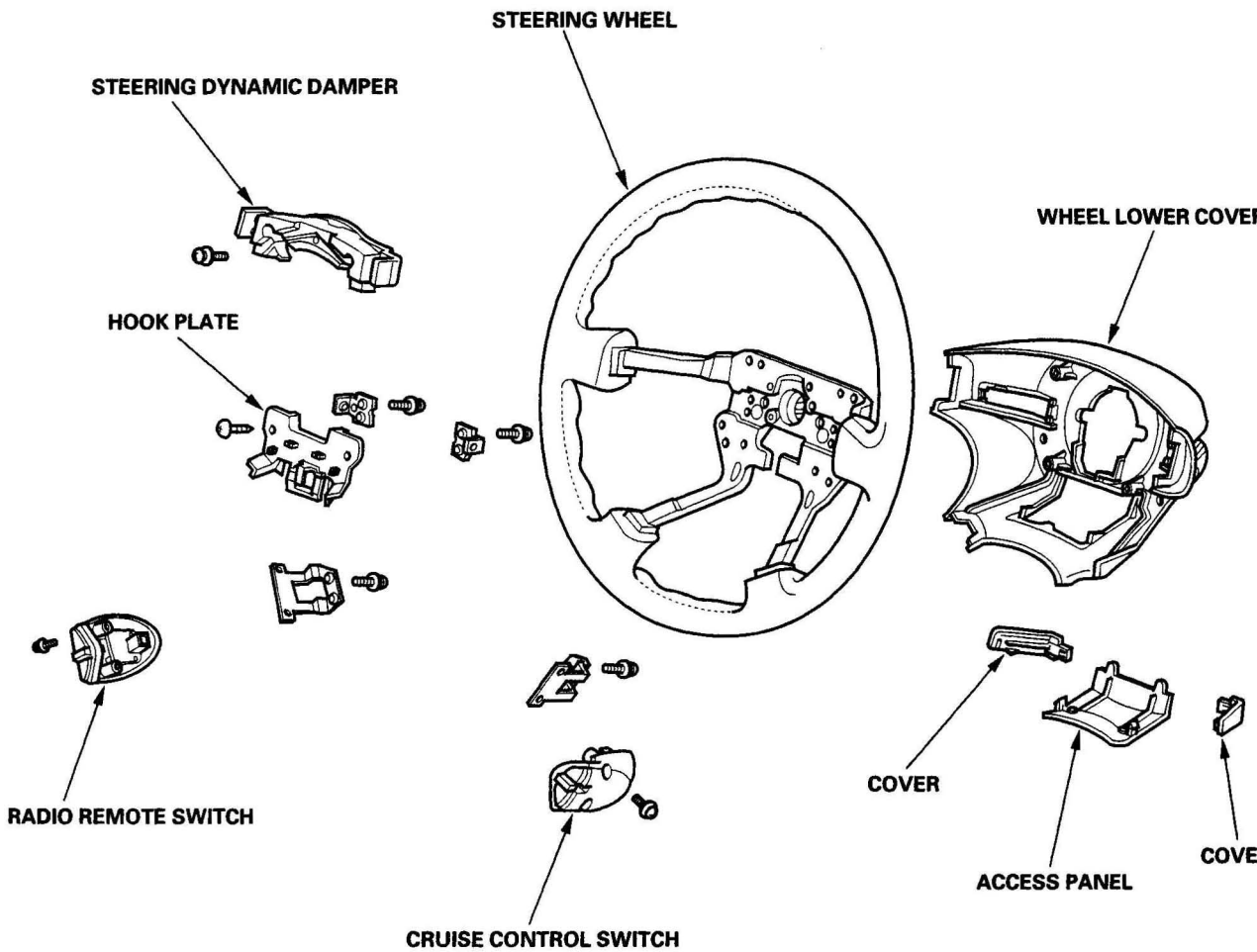
4. Remove the steering wheel puller, then remove the steering wheel bolt and steering wheel from the steering column.



BACK

Protected by AR

Steering Wheel Disassembly and Reassembly

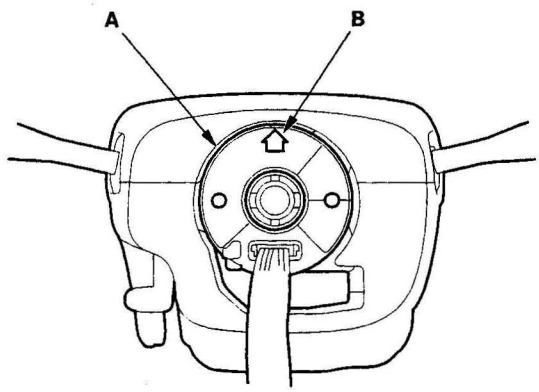


BACK

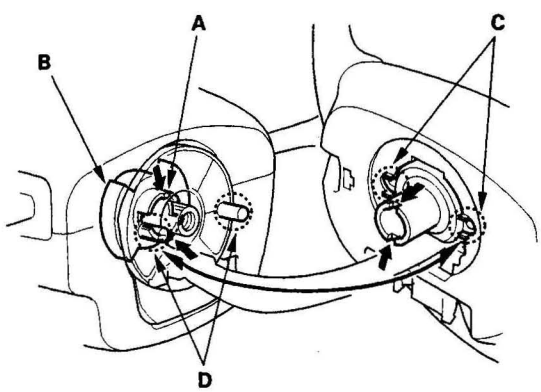
Protected by AR

Steering Wheel Installation

1. Before installing the steering wheel, make sure the front wheels are aligned straight ahead, then center the cable reel (A). Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise about two and half turns. The arrow mark (B) on the cable reel label point should point straight up.



2. Position the 2 tabs (A) of the turn signal cancelling sleeve (B) as shown, and install the steering wheel on to the steering column shaft, making sure the steering wheel hub (C) engages the pins (D) of the cable reel and tabs of the canceling sleeve. Do not tap on the steering wheel or steering column shaft when installing the steering wheel.



3. Install the steering wheel bolt and tighten it to 39 N·m (4.0 kgf·m, 29 lbf·ft).

4. Connect the radio remote switch connector and cruise control switch connector.

5. Install the driver's airbag and confirm that the system is operating properly (see step 1 on page 23-220).

6. Check the horn, radio remote switches, cruise control set/resume switches and turn signal cancelling for proper operation.

BACK

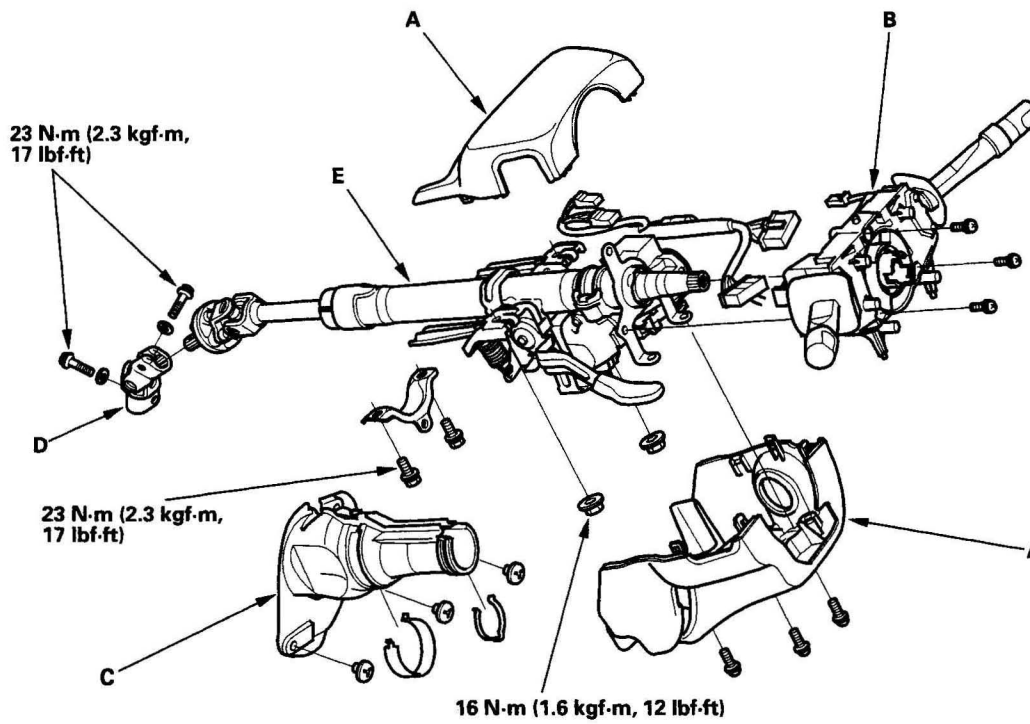
Protected by AR

Steering Column Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 23-14), precautions (see page 23-17), and procedures in the SRS section before performing repairs or service.

Removal

1. Record the radio station presets, and disconnect the battery.
2. Remove the driver's airbag, steerring wheel, and cable reel (see page 23-231).
3. Remove the driver's dashboard lower cover (see page 20-65).
4. Remove the column covers (A).



5. Remove the combination switch assembly (B) from the steering column shaft by removing the three mounting screws, and disconnecting the connectors.
6. Disconnect the ignition switch connectors.
7. Remove the steering joint cover (C).
8. Disconnect the steering joint (D), and remove it from the column shaft.
9. Remove the steering column (E) by removing the attaching nuts and bolts.

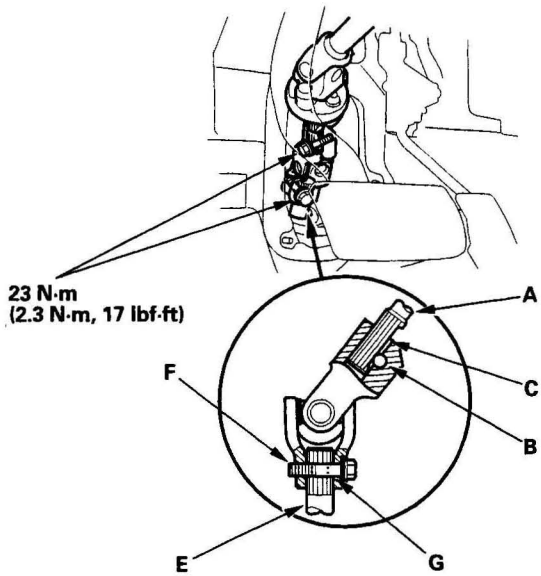
BACK

Protected by AR

Installation

1. Install the steering column and make sure the wires are not caught or pinched by any parts.

2. Insert the upper end of the steering joint onto the steering shaft (A) (line up the bolt hole (B) with the flat portion (C) on the shaft).



3. Slip the lower end of the steering joint onto the pinion shaft (E) (line up the bolt hole (F) with the groove (G) the around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.

4. Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it.

5. Finish the installation, and note these items:

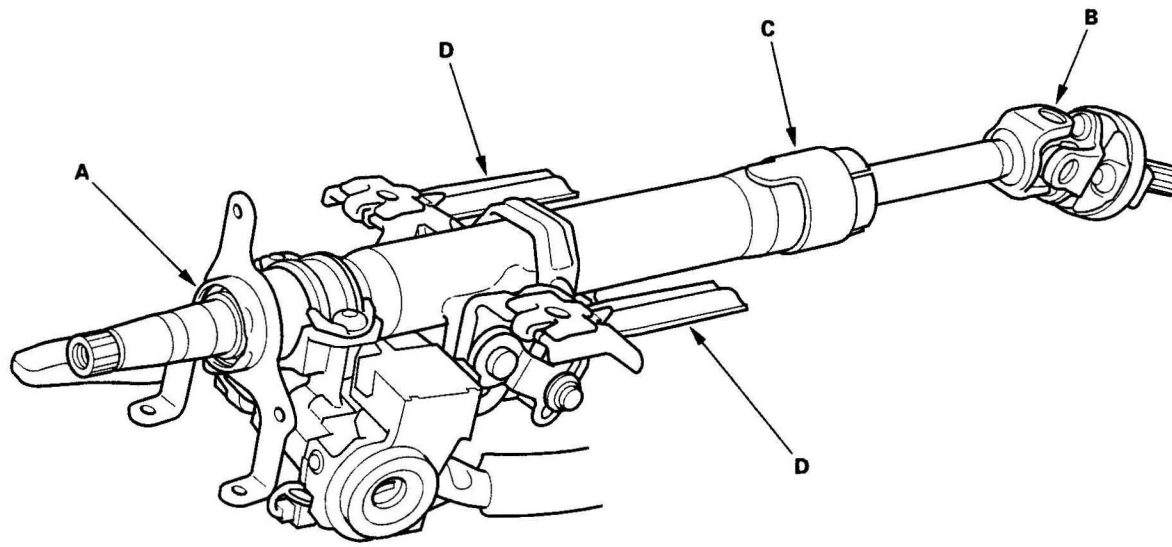
   - Make sure the wire harness is routed and fastened properly.
   - Make sure the connectors are properly connected.
   - Reinstall the steering wheel (see page 17-29).
   - Reconnect the battery and reset the radio presets.
   - Verify cruise control, horn, radio remote, and turn signal switch operation.
   - Check wheel alignment (see page 18-5).

BACK

Protected by AR

Steering Column/Tilt Lever Inspection/Adjustment

- Check the steering column ball bearing (A) and the steering joint bearings (B) for play and proper movement. If any bearing is noisy or has excessive play, replace the steering column as an assembly.
- Check the retaining collar (C) for damage. If it is damaged, replace the steering column as an assembly.
- Check the absorbing plates (D) for distortion or breakage. If there is distortion breakage replace the steering column as an assembly.

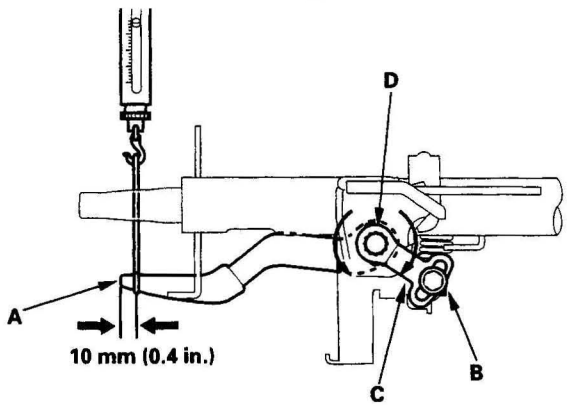


BACK

Protected by AR

1. Move the tilt lever (A) from the loose position to the lock position 3 to 5 times; then measure the tilt lever preload 10 mm (0.4 in.) from the end of the tilt lever.

Preload: 70–90 N (7–9 kgf, 15–20 lbf)



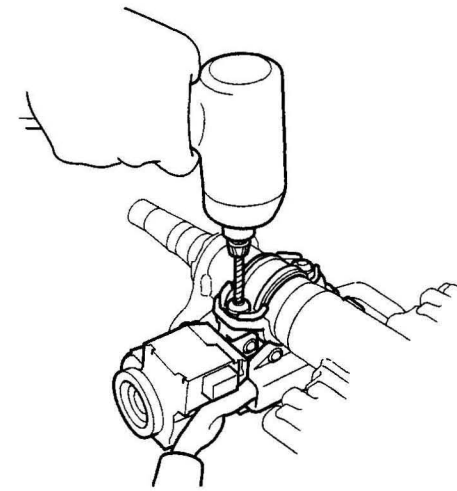
2. If the measurement is out of the specification, adjust the preload using the following procedures.

   - Loosen the tilt lever, and set the steering column in the neutral position.
   - Remove the 6 mm lock bolt (B), and remove the stop (C). Be careful not to loosen the tilt lever when installing the stop or tightening the 6 mm lock bolt.
   - Adjust the preload by turning the tilt lock bolt (D) left or right.
   - Pull up the tilt lever to the uppermost position, and install the stop. Check the preload again. If the measurement is still out of specification, repeat the above procedures to adjust.

Steering Lock Replacement

1. Remove the steering column (see page 17-30).

2. Center punch each of the 2 shear bolts, and drill their heads off with a 5 mm (3/16 in.) drill bit. Be careful not to damage the switch body when removing the shear bolts.



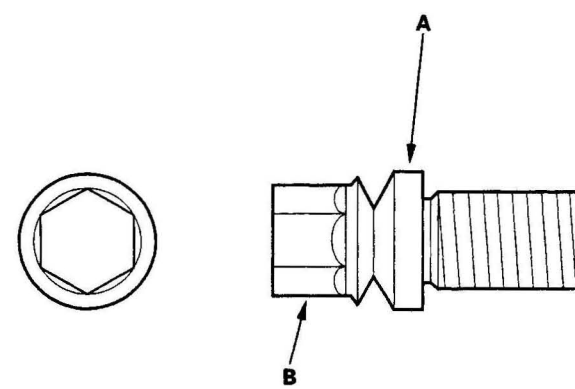
3. Remove the shear bolts from the switch body.

4. Install the switch body without the key inserted.

5. Loosely tighten the new shear bolts.

6. Insert the ignition key, and check for proper operation of the steering wheel lock and that the ignition key turns freely.

7. Tighten the shear bolts (A) until the hex heads (B) twist off.



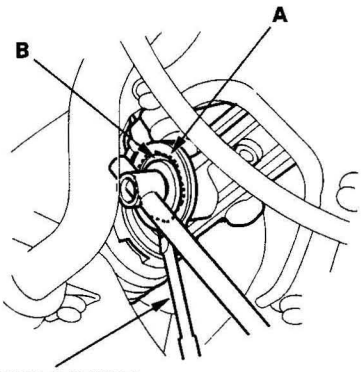
BACK

Protected by AR

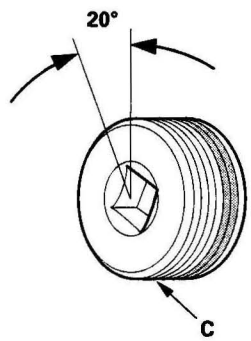
Rack Guide Adjustment

Special Tools Required
Locknut wrench, 40 mm 07916-SA50001

1. Set the wheels in the straight ahead position.
2. Loosen the rack guide screw locknut (A) with the special tool, then remove the rack guide screw (B).



3. Remove the old sealant from rack guide screw, and apply new sealant all around the threads (C). Loosely install the rack guide screw on the steering gearbox.



4. Tighten the rack guide screw to 25 N·m (2.5 kgf·m, 18 lbf·ft), then loosen it.
5. Retighten the rack guide screw to 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft) then back it off to specified angle.

   Specified Return Angle: 20°

6. Tighten the locknut while holding the rack guide screw.
7. Check for unusual steering effort through the complete turning travel.
8. Check the steering wheel rotational play and the power assist (see page 17-8).

BACK

Protected by AR

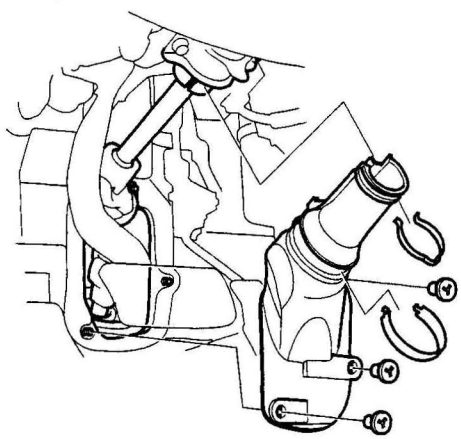
Steering Gearbox Removal

Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

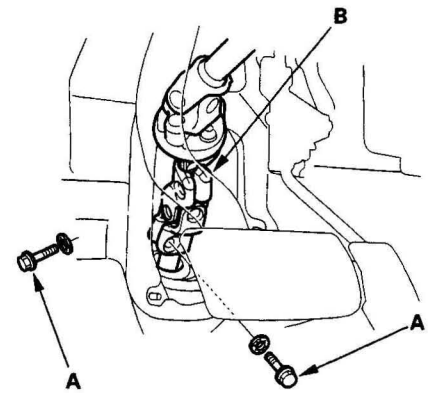
Note these items during removal:

- Using solvent and a brush, wash any oil and dirt off of the valve body unit its lines, and the end if the gearbox. Blow dry with compressed air.
- Be sure to remove the steering wheel before disconnecting the steering joint. Damage to the cable reel can occur.

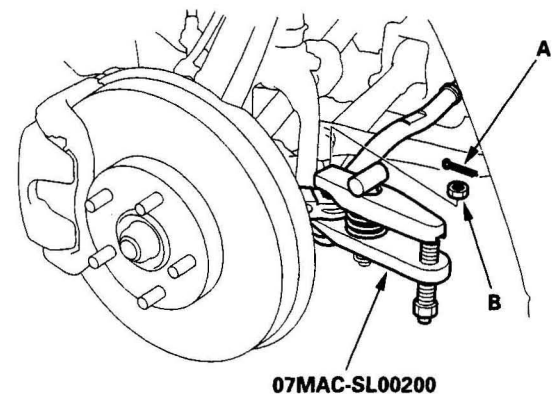
1. Drain the power steering fluid (see page 17-18).
2. Raise the vehicle, and make sure it is securely supported.
3. Remove the front wheels.
4. Remove the driver's airbag assembly (see page 23-219).
5. Remove the steering wheel (see page 17-27).
6. Remove the steering joint cover.



7. Remove the steering joint bolts (A), disconnect the steering joint by moving the steering joint (B) toward the column.



8. Remove the cotter pin (A) from the 10 mm nut (B), and loosen the nut.



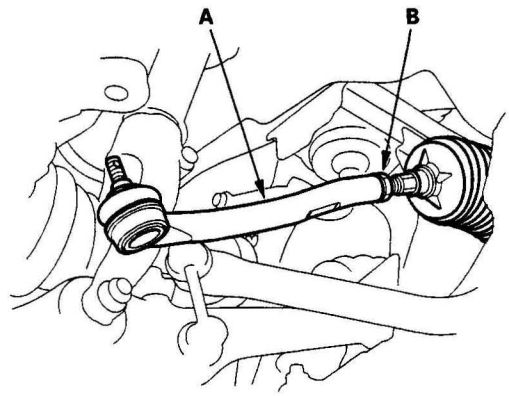
9. Separate the tie-rod ball joint and knuckle using the special tool (see page 18-9).

(cont'd)

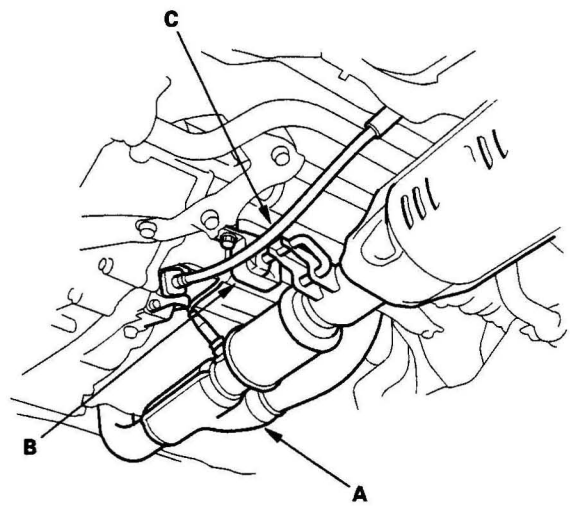
Protected by AR

Steering Gearbox Removal (cont'd)

10. Grasp the right tie-rod and pull the rack all the way to the right, then remove the right and left tie-rod ends (A), and locknuts (B).

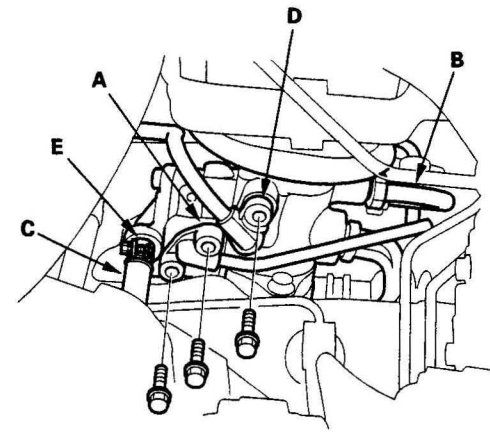


11. Remove the exhaust pipe A and mounting bracket B (see page 9-12).

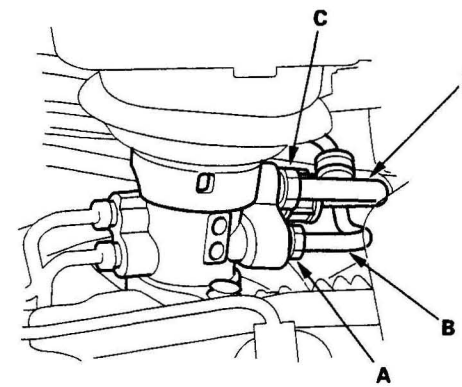


12. '99 model: Disconnect the A/T shift cable (C) from the transmission (see page 14-129).
'00-03 models: Disconnect the A/T shift cable (C) from the transmission (see page 14-370).

13. '99-03 Premium models:
Disconnect the supply line (A), the return line (B), the sensor inlet hose (C), and the sensor return line (D) from the valve body unit. Remove the sensor inlet hose fitting (E).



14. '02-03 Type-S models:
Loosen the 14 mm flare nut (A), and disconnect the pump outlet hose (B). Loosen the 17 mm flare nut (C), and remove the return line (D).



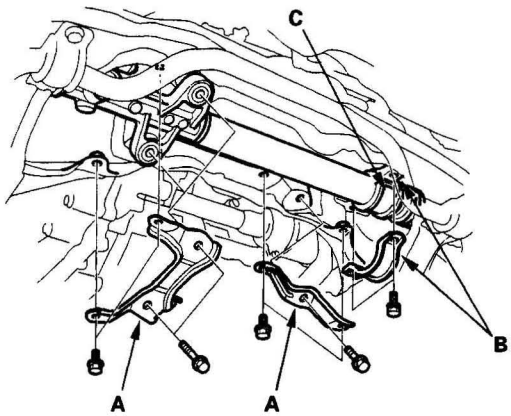
BACK

Protected by AR

15. After disconnecting the hoses and lines, plug or seal them with a piece of tape or equivalent to prevent foreign materials from entering.

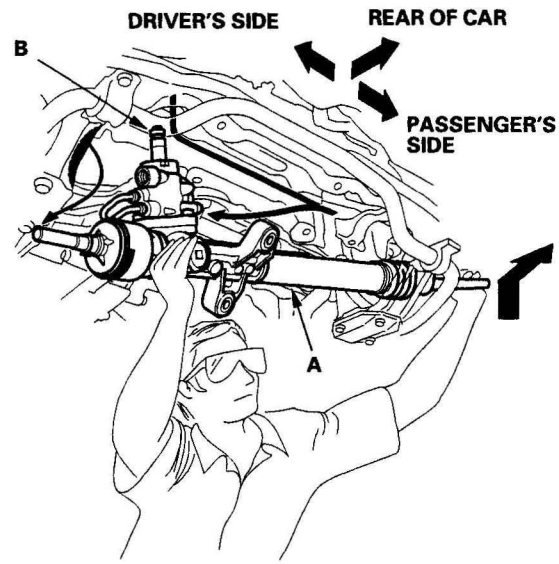
    NOTE: Do not loosen the cylinder line A and B between the valve body unit and cylinder.

16. Remove the stiffener plates (A), then remove the right mounting brackets (B) and the cushion (C).



17. Pull the steering gearbox (A) down until the pinion shaft (B) clears the bulkhead, and remove the pinion shaft grommet from the top of the valve body unit.

    NOTE: Apply vinyl tape to the pinion shaft splines and the line fitting surfaces on the valve body unit to protect them during removal.



18. Move the steering gearbox to the passenger's side unit the driver's side rack end rests on the end of the rear beam.

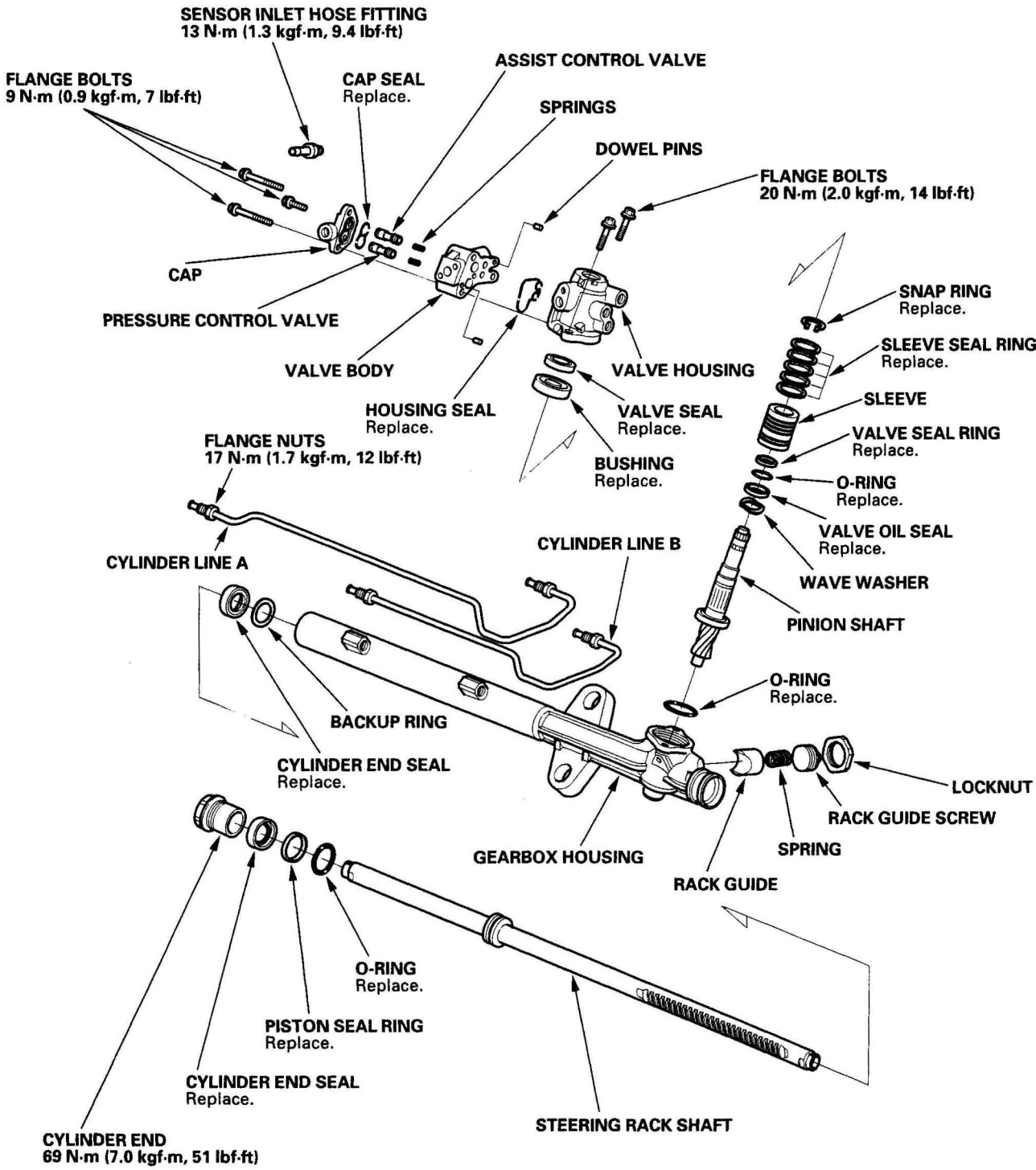
19. To get the driver's side rack end around the rear beam, push up and back on the passenger's side rack end, then pull down on the driver's side of the steering gearbox.

Protected by AR

Steering Gearbox Overhaul

Exploded View

'99-03 Premium models:



BACK

Protected by AR

Special Tools Required
- Cylinder end seal remover attachment 07NAD-SR3020A
- Pilot collar 07GAF-PH70100
- Valve seal ring sizing tool 07NAG-SR3090A
- Sleeve seal ring guide 07SAG-SW50100
- Sleeve seal ring sizing tool 07GAG-SD4020A
- Attachment, 32 x 35 mm 07746-0010100
- Driver 07749-0010000
- Piston seal ring guide 07XAG-S0K020A
- Piston seal ring sizing tool 07XAG-S0K010A
- Pincers, Oetiker 1098 or equivalent, commercially available.

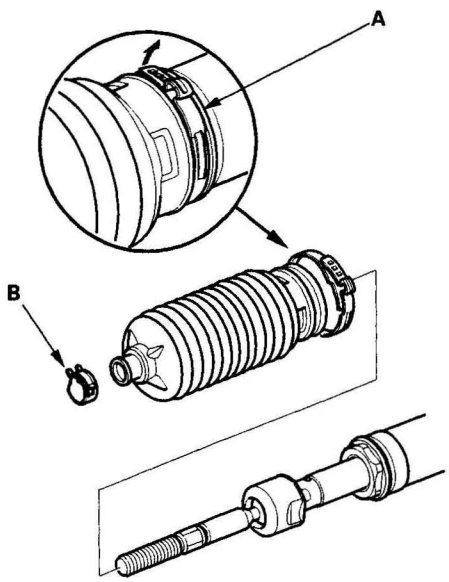
NOTE: Refer to the Exploded View as needed during this procedure.

Removal

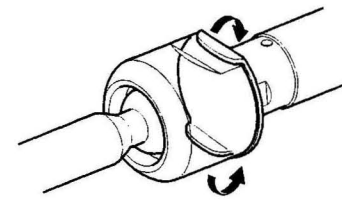
1. Remove the steering gearbox (see page 17-35).

Disassembly

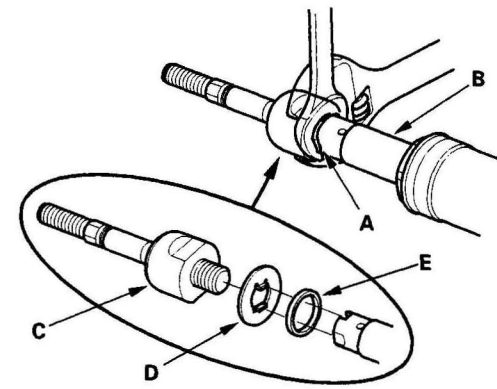
2. Remove the boot bands (A) and tie-rod clips (B). Pull the boots away from the ends of the gearbox.



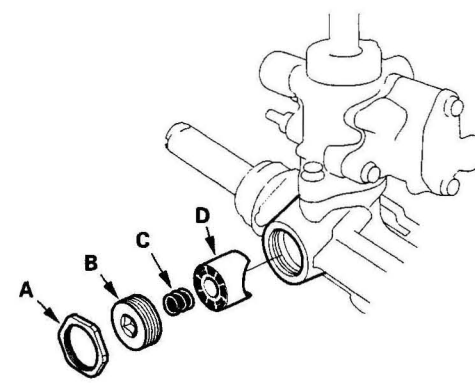
3. Unbend the lock washer.



4. Hold the flat surface sections (A) of the right side steering rack (B) with a wrench, and unscrew the both rack ends (C) with a wrench. Be careful not to damage the rack surface with the wrench. Remove the lock washer (D) and stop washer (E).



5. Loosen the locknut (A), then remove the rack guide screw (B).



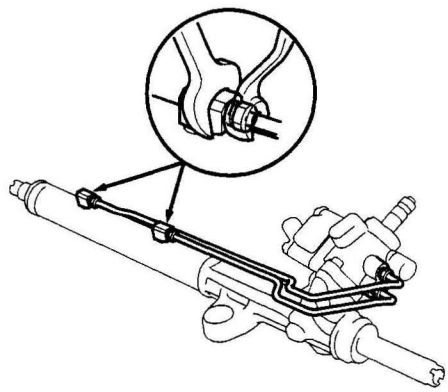
6. Remove the spring (C) and the rack guide (D) from the gearbox.

(cont'd)

Protected by AR

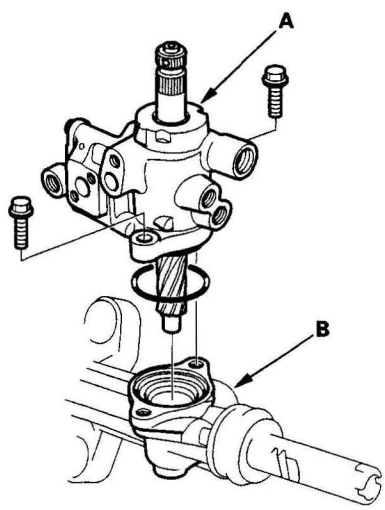
Steering Gearbox Overhaul (cont'd)

7. Remove the cylinder lines from the gearbox.

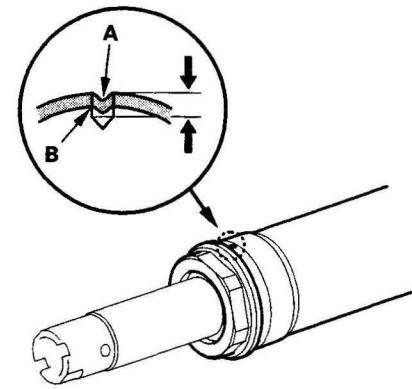


8. Drain the fluid from the cylinder fittings by slowly moving the steering rack back and forth.

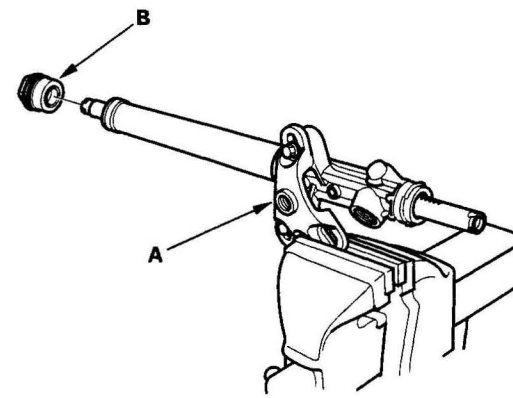
9. Remove the 2 flange bolts, then remove the valve body unit (A) from the gearbox (B).



10. Drill a 3 mm (0.12 in.) diameter hole approximately 2.5–3.0 mm (0.10–0.12 in.) in depth in the staked point (A) on the cylinder. Do not allow metal shavings to enter the cylinder housing. After removing the cylinder end, remove any burrs (B) at the staked point.



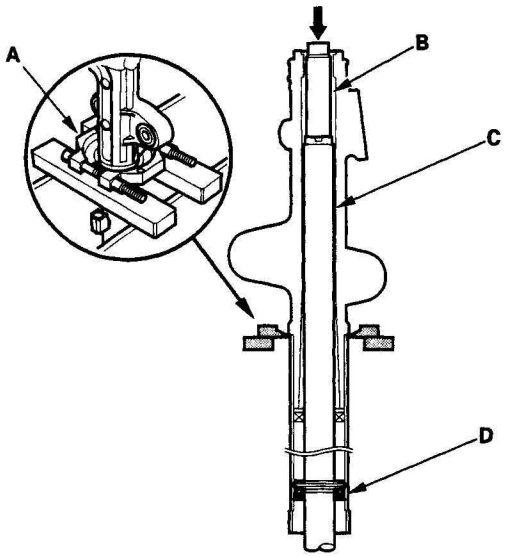
11. Attach the yoke of a universal puller (A) to the steering gearbox mounts with bolts. Clamp the yoke in a vise with soft jaws as shown, then loosen and remove the cylinder end (B). Do not clamp the cylinder housing or gearbox housing in the vise.



BACK

Protected by AR

12. Install the bearing separator (A) on the gearbox housing as shown.

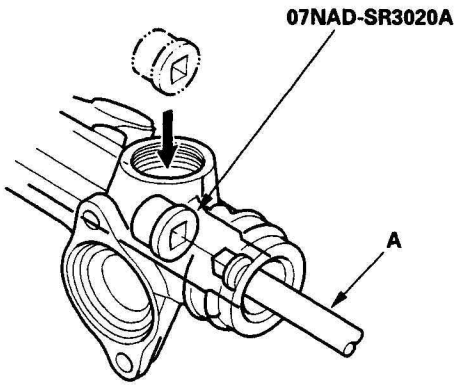


13. Place a appropriate size deep socket wrench (B) on the steering rack (C).

14. Set the steering gearbox in a press so the left side points upward, then press the cylinder end seal (D) and steering rack out of the gearbox. Hold the steering rack to keep it from falling when pressed clear. Be careful not to damage the inner surface of the cylinder housing with the tool.

15. Remove the cylinder end seal from the steering rack.

16. Insert a 24" long, 3/8" drive extension (A) and the special tool into the cylinder from the left side. Make sure that the special tool is securely positioned on the backup ring edges. Be careful not to damage the inner surface of the cylinder with the special tool.



(cont'd)

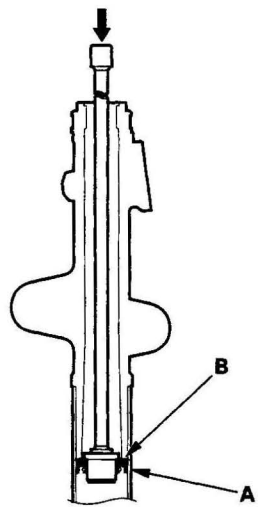
Protected by AR

Steering Gearbox Overhaul (cont'd)

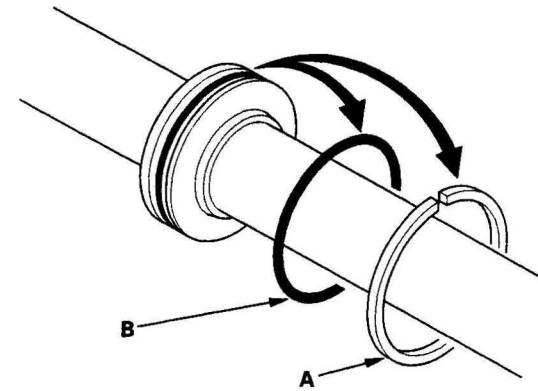
17. Set the gearbox in a press, then press out the cylinder end seal (A) and backup ring (B) from the gearbox.

    Note these items when pressing the cylinder end seal:

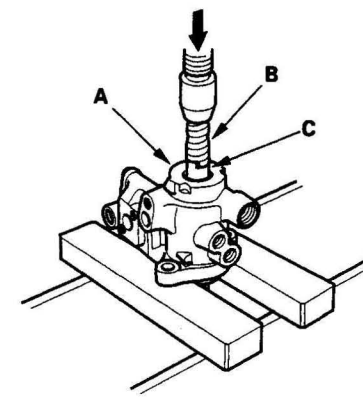
    - Keep the tool straight to avoid damaging the cylinder wall. Check the tool angle, and correct it if necessary, when removing the cylinder end seal.
    - Use a press to remove the cylinder end seal. Do not try to remove the seal by striking the tool. It will break the backup ring, and the cylinder end seal will remain in the gearbox.



18. Carefully pry the piston seal ring (A) and O-ring (B) off the rack piston. Be careful not to damage the inside of the seal ring groove and piston edges when removing the seal ring.



19. Before removing the valve housing (A), apply vinyl tape (B) to the splines on the pinion shaft (C).



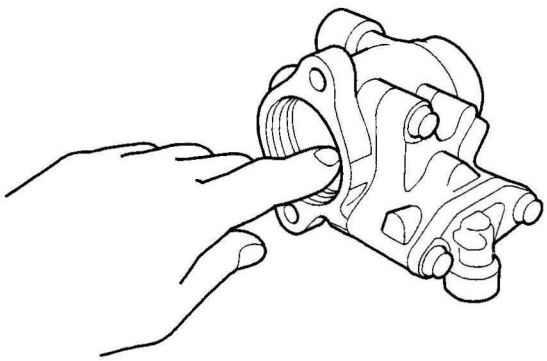
20. Separate the valve housing from the pinion shaft/ valve using a press.

BACK

Protected by AR

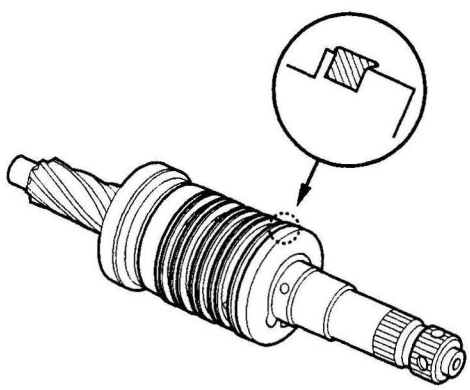
21. With your finger, check the inner wall of the valve housing where the seal ring slides. If there is a step in the wall, the housing is worn. Replace it.

    NOTE: There may be sliding marks from the seal ring on the wall of the valve housing. Replace the valve housing only if the wall is stepped.

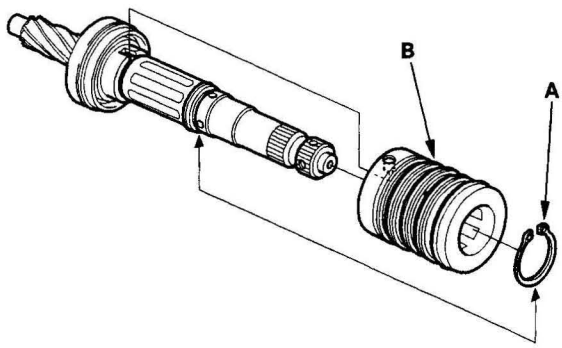


22. Check for wear, burrs and other damage to the edges of the grooves in the sleeve.

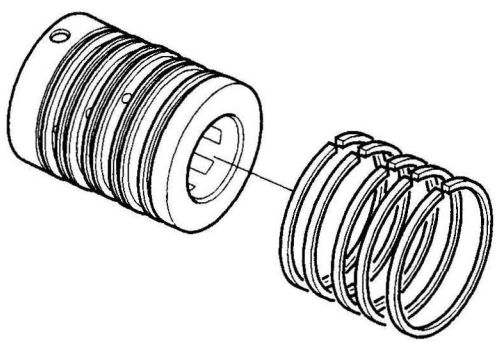
    NOTE: The pinion shaft and sleeve are a precision matched set. If either the pinion shaft or sleeve must be replaced, replace both parts as a set.



23. Remove the snap ring (A) and sleeve (B) from the pinion shaft.



24. Using a cutter or an equivalent tool, cut and remove the 5 seal rings from the sleeve. Be careful not to damage the edges of the sleeve grooves and outer surface when removing the seal rings.

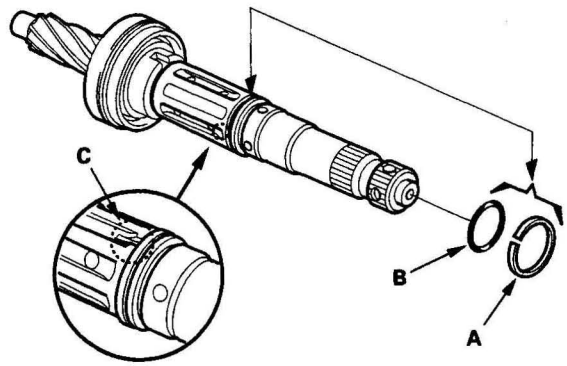


(cont'd)

Protected by AR

Steering Gearbox Overhaul (cont'd)

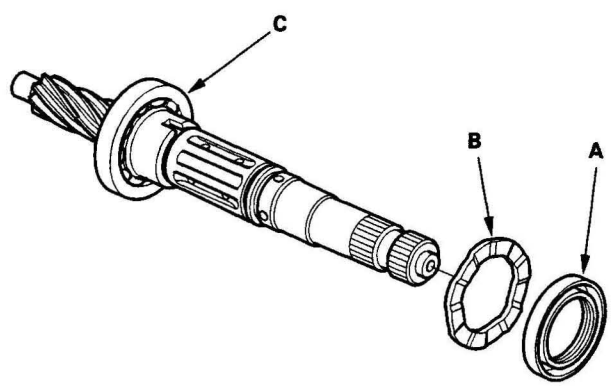
25. Using a cutter or an equivalent tool, cut the valve seal ring (A) and O-ring (B) at the groove (C) in the pinion shaft. Remove the valve seal ring and O-ring. Be careful not to damage the edges of the pinion shaft groove and outer surface when removing the valve seal ring and O-ring.



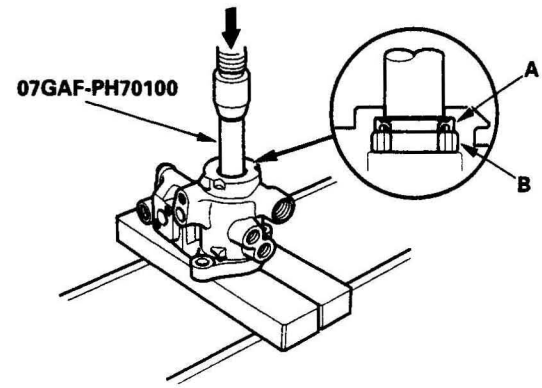
26. Remove the valve oil seal (A) and wave washer (B) from the pinion shaft.

    Note these items during disassembly:

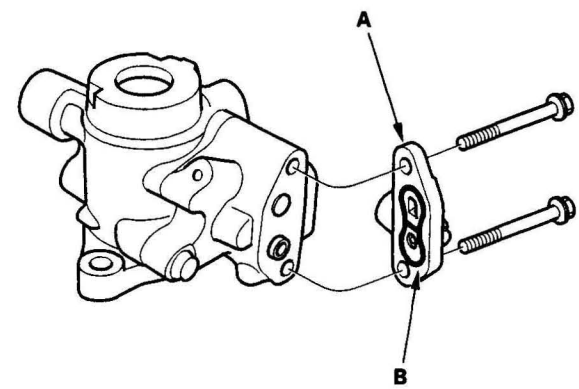
    - Inspect the ball bearing (C) by rotating the outer race slowly. If there is any excessive play, replace the pinion shaft and sleeve as an assembly.
    - The pinion shaft and sleeve are a precise fit; do not intermix old and new pinion shafts and sleeves.



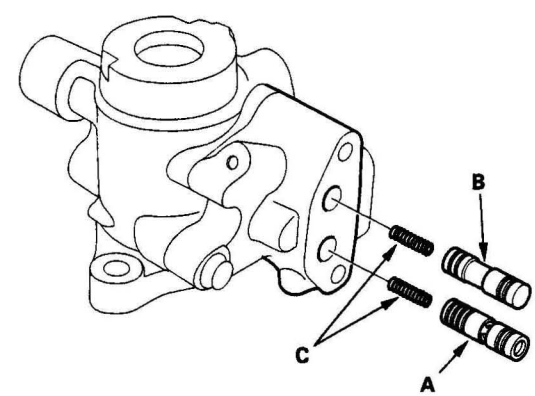
27. Press the valve oil seal (A) and bushing (B) out of the valve housing using a hydraulic press and special tool.



28. Remove the cap (A) and cap seal (B) from the valve body.



29. Remove the pressure control valve (A), assist control valve (B) and springs (C).

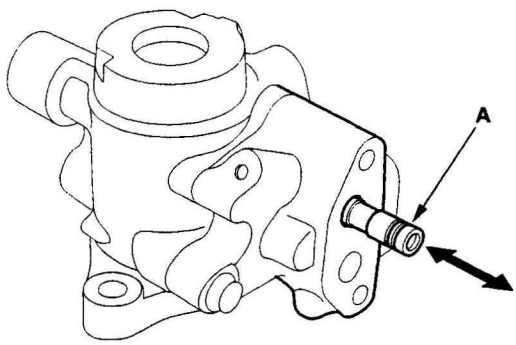


BACK

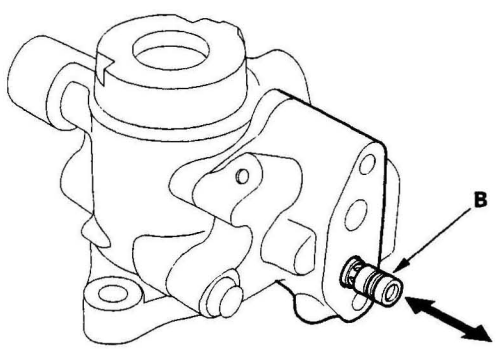
Protected by AR

30. Check the assist control valve (A) and pressure control valve (B). If the valves are damaged, replace the valve body as an assembly. Inspect its surface for scoring and scratches. Slip it back into the valve body unit, and make sure it slides smoothly without drag or side play.

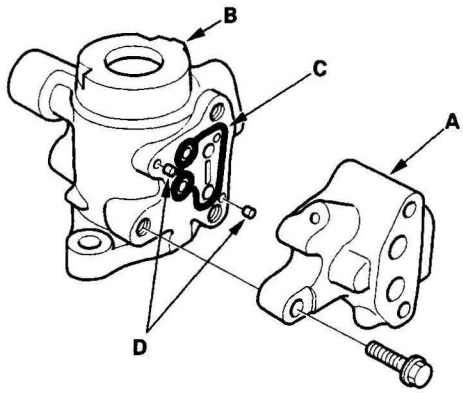
Assist Control Valve



Pressure Control Valve



31. Separate the valve body (A) and valve housing (B).

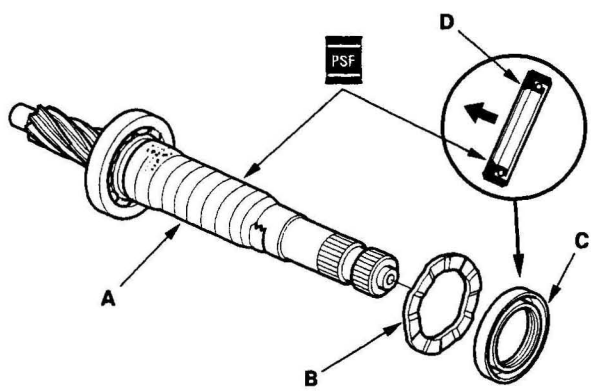


32. Remove the valve housing seal (C) dowel pins (D).

33. Clean the disassembled parts with solvent, and dry them with compressed air. Do not dip rubber parts in the solvent.

Reassembly

34. Apply vinyl tape (A) to the stepped portion of the pinion shaft, and coat the surface of the vinyl tape with the power steering fluid.



35. Install the wave washer (B).

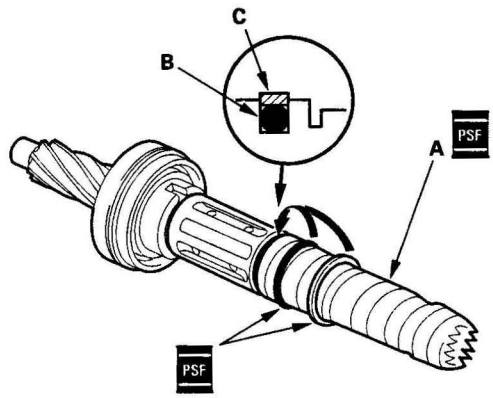
36. Coat the inside surface of the new valve oil seal (C) with power steering fluid, and install the seal with its grooved side facing opposite the bearing, then slide it over the pinion shaft, being careful not to damage its sealing lip (D). Remove the vinyl tape.

(cont'd)

Protected by AR

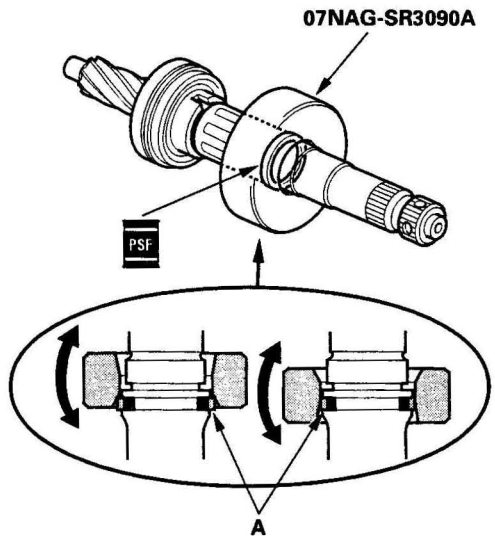
Steering Gearbox Overhaul (cont'd)

37. Apply vinyl tape (A) to the splines and stepped portion of the shaft, and coat the surface of the vinyl tape with the power steering fluid.



38. Fit the new O-ring (B) in the groove of the pinion shaft. Then slide the new valve seal ring (C) over the shaft and in the groove on the pinion shaft.

39. Remove the tape, and apply power steering fluid to the surface of the valve seal ring (A).



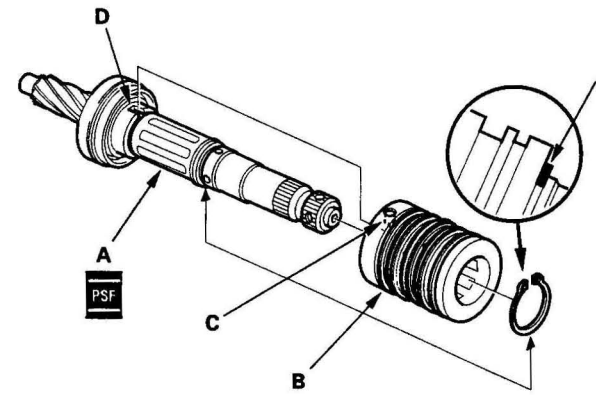
40. Apply power steering fluid to the inside of the special tool. Set the larger diameter end of the special tool over the valve seal ring, and move the special tool up and down several times to make the valve seal ring fit in the pinion shaft groove.

41. Remove the special tool, turn it over, slide the smaller diameter end over the valve seal ring. Move it up and down several times to make the valve seal ring fit snugly in the pinion shaft groove.

42. Apply power steering fluid to the surface of the pinion shaft (A). Slide the sleeve (B) onto the pinion shaft by aligning the locating pin (C) on the inside of the sleeve with the cutout (D) in the shaft. Then install the new snap ring (E) securely in the pinion shaft groove.

    Note these items during reassembly:

    - Be careful not to damage the valve seal ring when inserting the sleeve.
    - Install the snap ring with its radiused side toward the sleeve.



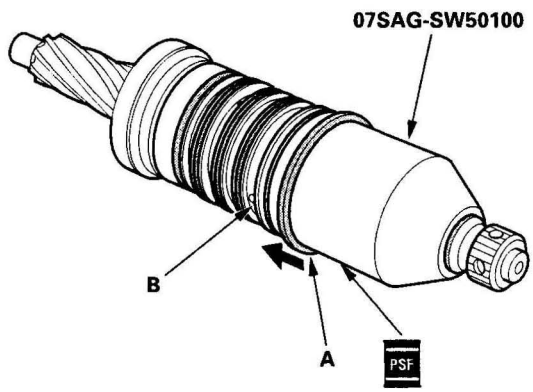
BACK

Protected by AR

43. Apply power steering fluid to the surface of the special tool. Slip 5 new seal rings (A) over the special tool from the smaller diameter end, and expand them.

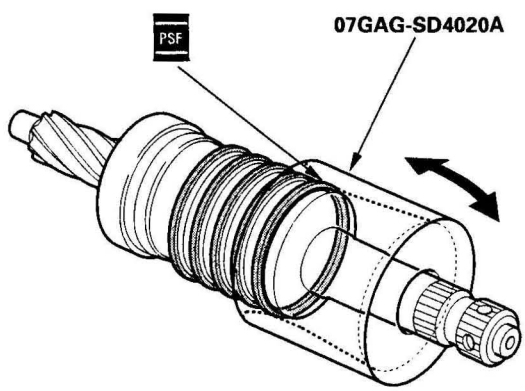
    Note these items when installing the seal ring:

    - Do not over-expand the seal ring. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal rings using the special tool (sizing tool).
    - There are 2 types of sleeve seal rings: black and brown. Do not mix the different types of rings as they are not compatible.



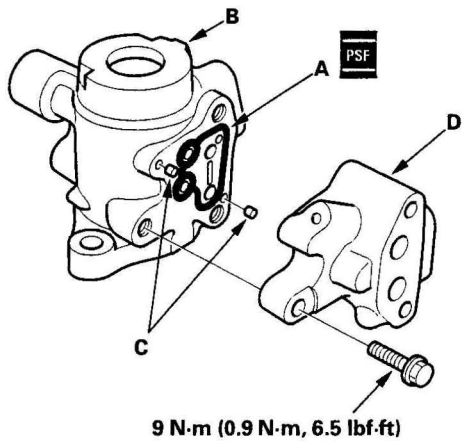
44. Align the special tool with each groove (B) in the sleeve, and slide a sleeve seal ring into each groove. After installation, compress the seal rings with your fingers temporarily.

45. Apply power steering fluid to the seal rings on the sleeve, and to the entire inside surface of the special tool, then slowly insert the sleeve into the special tool.

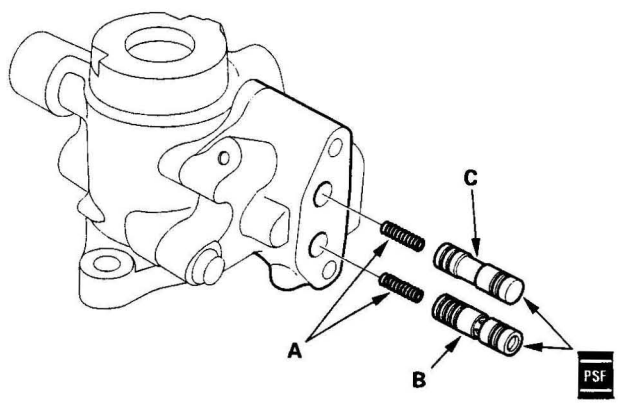


46. Move the special tool back and forth several times to make the seal rings snugly fit in the sleeve. Be sure that the seal rings are not twisted.

47. Coat the housing seal (A) with power steering fluid, and install it in the groove of the valve housing (B). Install the 2 dowel pins (C) and valve body (D) on the valve housing.



48. Install the valve springs (A).



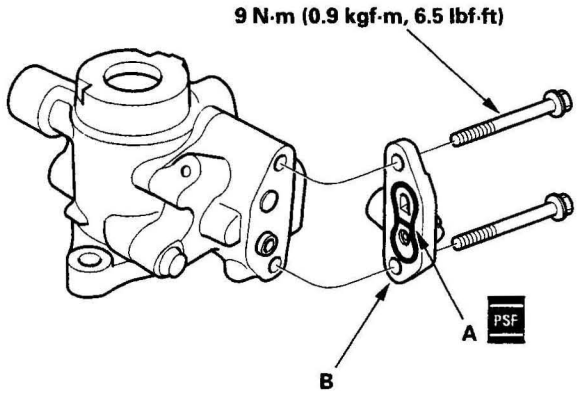
49. Coat the pressure control valve (B) and assist control valve (C) with power steering fluid, and install them into the valve body.

(cont'd)

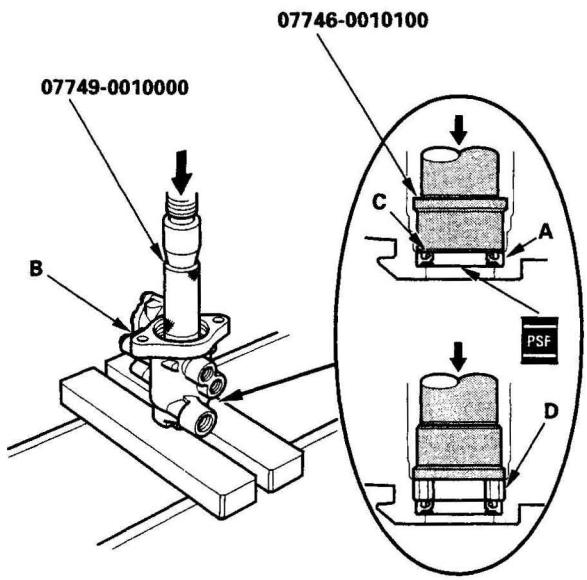
Protected by AR

Steering Gearbox Overhaul (cont'd)

50. Coat the cap seal (A) with power steering fluid, and install it in the groove of the cap (B). Install the cap on the valve body.

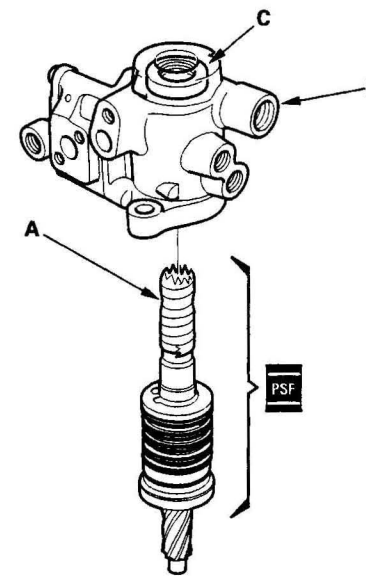


51. Apply power steering fluid to the seal ring lip of the new valve oil seal (A), then install the seal in the valve housing (B) using a hydraulic press and special tools. Install the seal with its grooved side (C) facing the tool.



52. Press the bushing (D) into the valve housing with a hydraulic press and special tool.

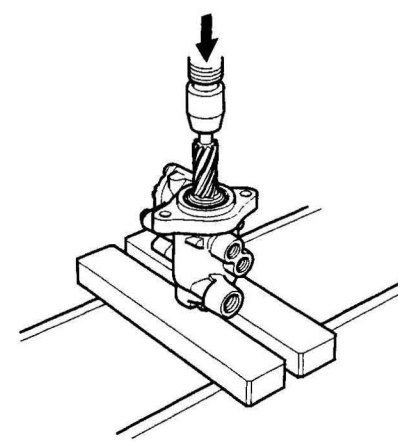
53. Apply vinyl tape (A) to the pinion shaft, then coat the vinyl tape with power steering fluid.



54. Insert the pinion shaft into the valve housing (B). Be careful not to damage the valve seal rings (C).

55. Remove the vinyl tape from the pinion shaft, then remove any residue from the tape adhesive.

56. Press the pinion shaft/sleeve into the valve housing with a hydraulic press. Check that the pinion shaft/sleeve turns smoothly by hand after installing it.



BACK

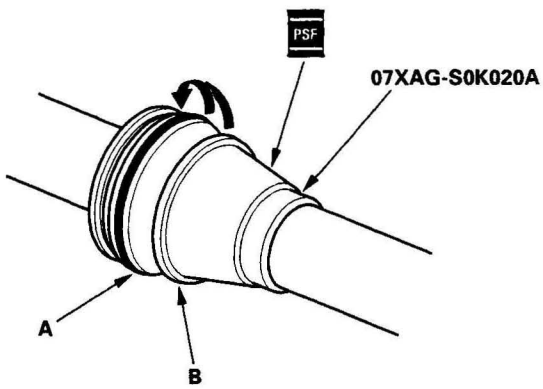
Protected by AR

57. Coat the special tool with power steering fluid, then slide it onto the rack, big end first.

58. Position the new O-ring (A) and new piston seal ring (B) on the special tool, then slide them down toward the big end of the tool.

    Note these items during reassembly:

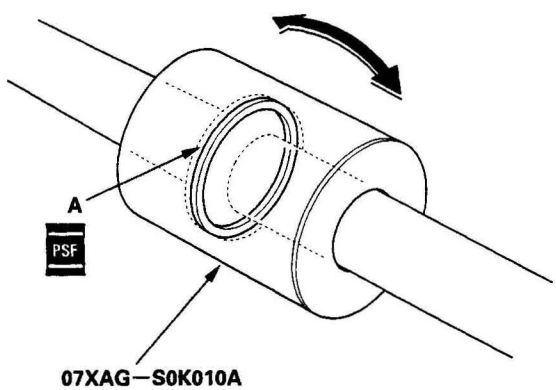
    - Do not over expand the resin seal rings. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal ring using the special tool (sizing tool).
    - Replace piston's O-ring and seal ring as a set.



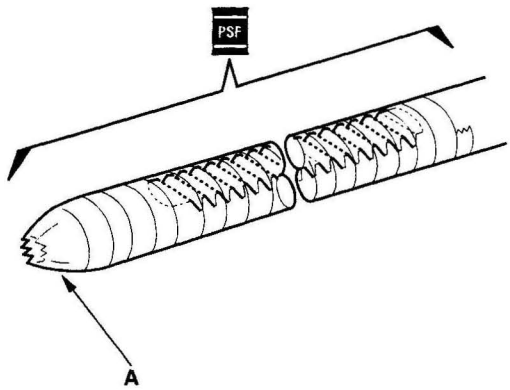
59. Pull the O-ring off into the piston groove, then pull the piston seal ring off into the piston groove on top of the O-ring.

60. Coat the piston seal ring (A) and the inside of the special tool with power steering fluid, then carefully slide the tool onto the rack and over the piston seal ring.

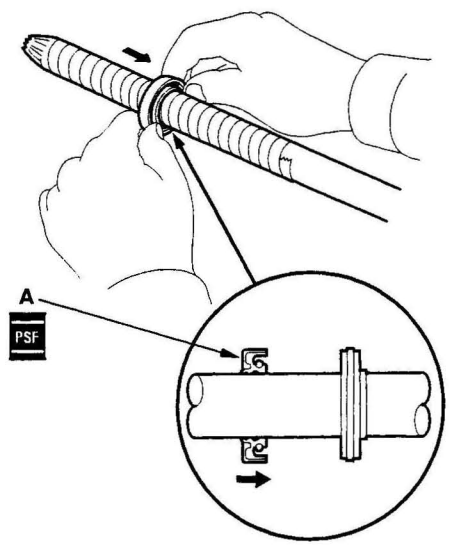
61. Move the special tool back and forth several times to make the piston seal ring fit snugly in the piston.



62. Wrap vinyl tape (A) around the rack teeth and rack end edges, then coat the surface of the tape with power steering fluid. Make sure that the vinyl tape is wrapped carefully so there is no stepped portion.



63. Coat the inside surface of the new cylinder end seal (A) with power steering fluid, then install it onto the steering rack with its grooved side toward the piston. When installing the cylinder end seal, be careful not damage the lip of the seal with the edges or teeth of the steering rack.



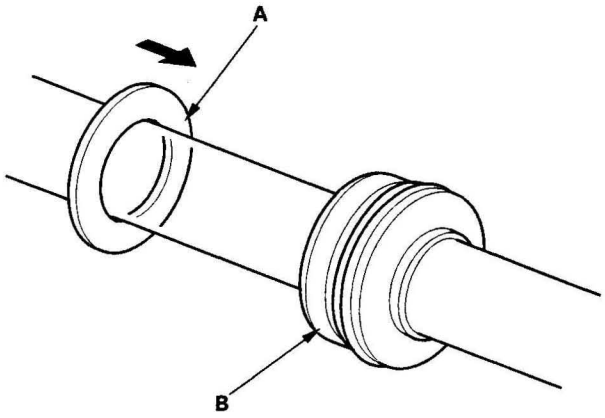
64. Remove the vinyl tape from the steering rack, then remove any adhesive residue.

(cont'd)

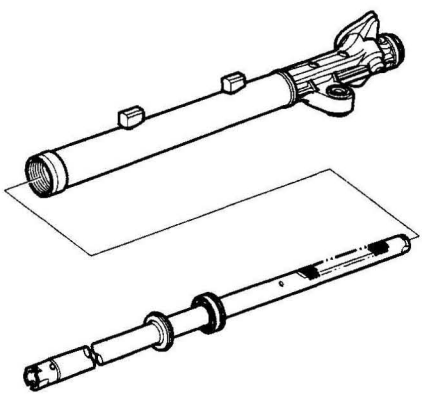
Protected by AR

Steering Gearbox Overhaul (cont'd)

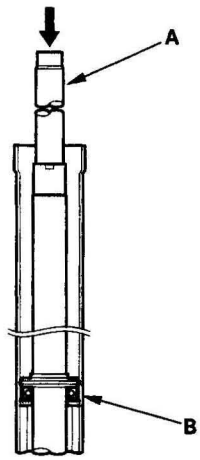
65. Install the new backup ring (A) on the steering rack, then place the cylinder end seal (B) against the piston.



66. Grease the steering rack teeth, then insert the steering rack into the gearbox housing. Be careful not to damage the inner surface of the cylinder wall with the rack edges.



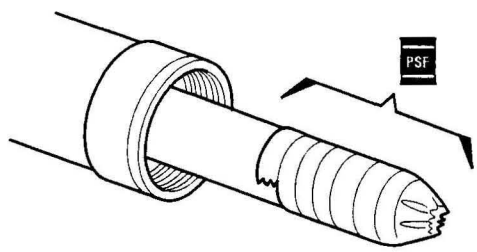
67. Insert an appropriate size deep socket wrench (A) onto the steering rack as shown.



68. Install the cylinder end seal (B) into the bottom of the cylinder by pressing on the tool with a press. Do not push on the tool with excessive force as it may damage the cylinder end seal.

69. Remove the deep socket wrench, and center the steering rack.

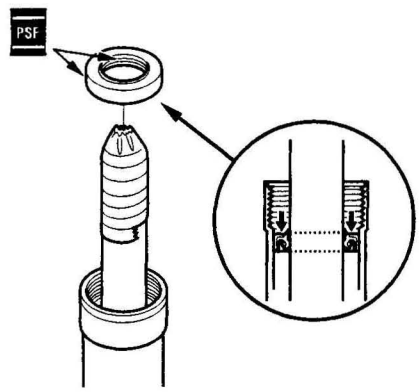
70. Wrap vinyl tape around the rack end edges, and coat the surface of the tape with the power steering fluid. Make sure that the vinyl tape is wrapped carefully so there is no stepped portion.



BACK

Protected by AR

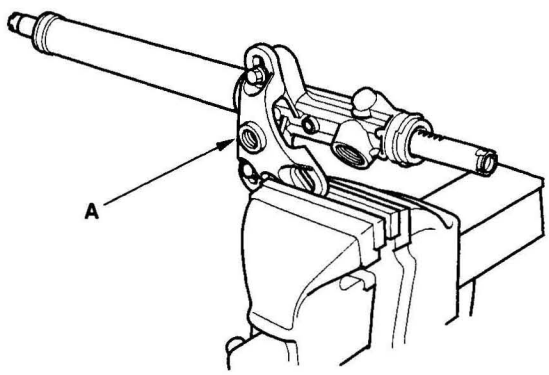
71. Coat the inside surface of the new cylinder end seal with power steering fluid, then install the seal onto the steering rack with its grooved side toward the piston.



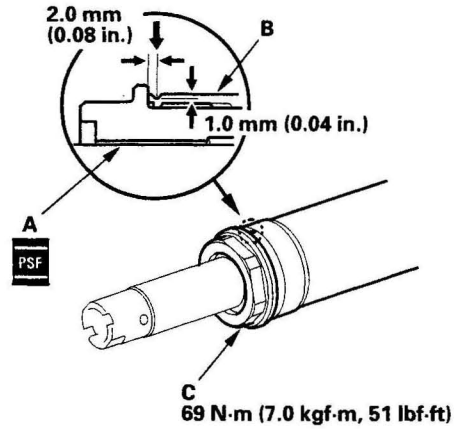
72. Push in the cylinder end seal with your finger. Be careful not to damage the face of the seal with the threads and burrs at the staked position of the cylinder housing.

73. Remove the vinyl tape from the steering rack, then remove any adhesive residue.

74. Attach the yoke of a universal puller (A) to the steering gearbox mounts with bolts, then clamp the yoke in a vise with soft jaws. Do not clamp the cylinder housing or gearbox housing in the vise.

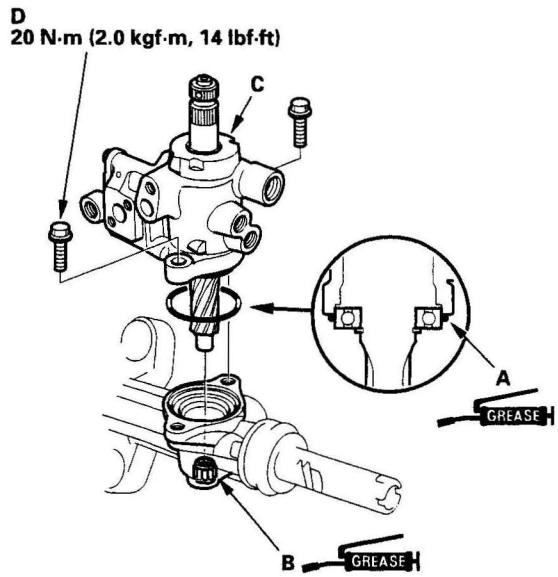


75. Coat the inside surface (A) of the cylinder end with power steering fluid, then install the cylinder end by screwing it into the cylinder (B).



76. Remove the yoke from the gearbox, then, after tightening the cylinder end (C), stake the point of the cylinder shown (opposite from where the stake was removed during disassembly).

77. Coat the new O-ring (A) with grease, and carefully fit it on the valve housing.



78. Apply grease to the needle bearing (B) in the gearbox housing, then install the valve body unit (C) by engaging the gears. Note the valve body unit installation position (direction of the line connections).

79. Tighten the flange bolts (D) to the specified torque.

(cont'd)

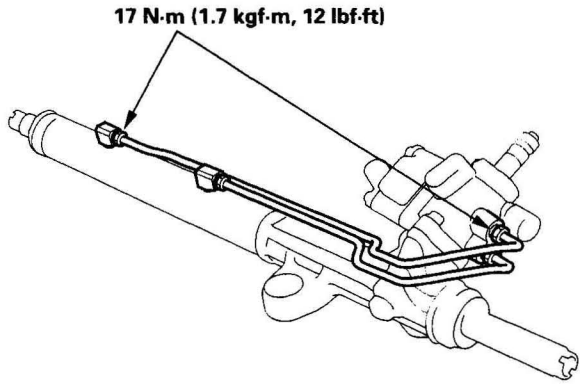
Protected by AR

Steering Gearbox Overhaul (cont'd)

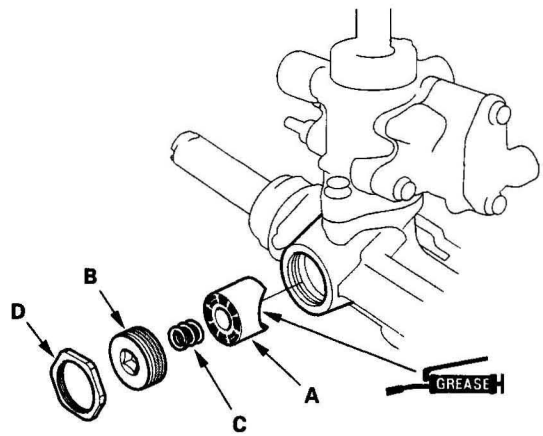
80. Install the cylinder lines.

    Note these items during reassembly:

    - Thoroughly clean the joints of the cylinder lines. The joints must be free of foreign material.
    - Install the cylinder lines by tightening the flare nuts by hand first, then tighten the flare nuts to the specified torque.



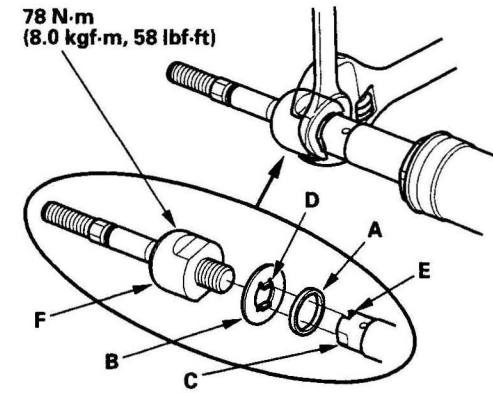
81. Grease the sliding surface of the rack guide (A), and install it onto the gearbox housing.



82. Apply sealant to the all around threads on the rack guide screw (B), then install the spring (C), rack guide screw and locknut (D).

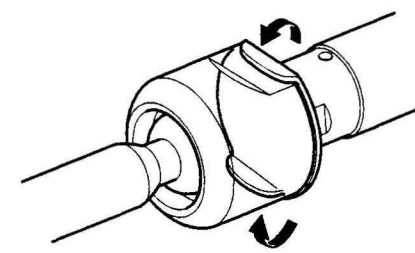
83. Adjust the rack guide screw (see page 17-34). After adjusting, check that the rack moves smoothly by sliding it right and left.

84. Install the stop washer (A), and the lock washer (B) on the rack (C). Align the lock washer tabs (D) with the slots (E) in the rack. Install the rack end (F) while holding with lock washer in place. Repeat this step for the other side of the rack.



85. Hold the flat surface sections of the right side steering rack with a wrench, and tighten the both rack ends. Be careful not to damage the rack surface with the wrench.

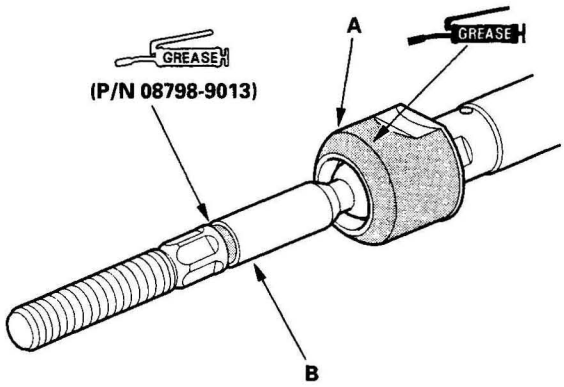
86. Bend the lock washer back against the flat spots on the rack end joint housing.



BACK

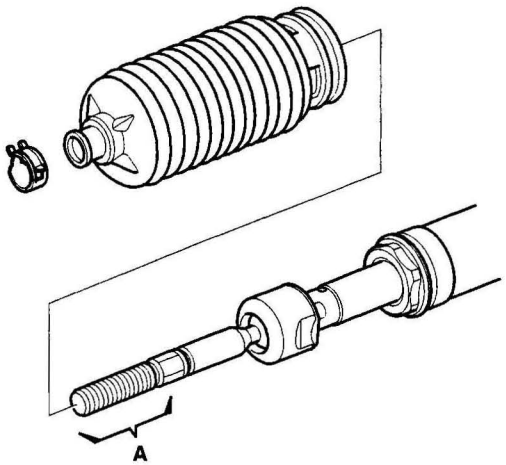
Protected by AR

87. Apply multipurpose grease to the circumference of the rack end joint housing (A).

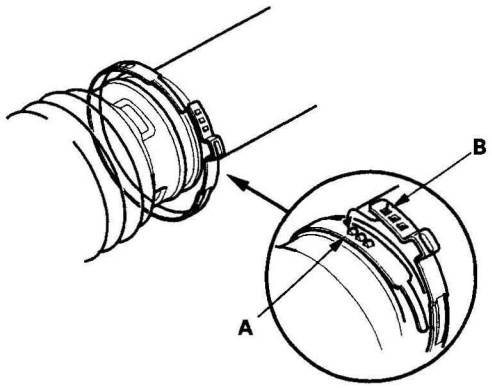


88. Apply a light coat of silicone grease to the boot grooves (B) on the rack end.

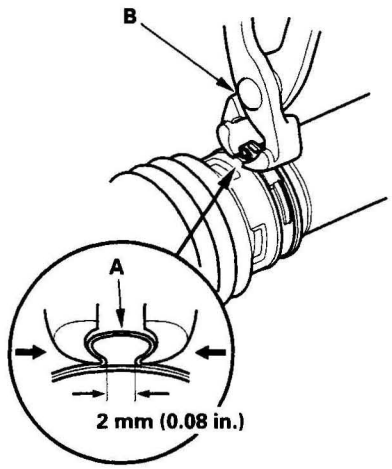
89. Center the steering rack within its stroke. Install the boots on the rack ends with the tie-rod clips. After installing the boots, wipe the grease off the threaded section (A) of the rack end.



90. Install the new boot bands by aligning the tabs (A) with holes (B) of the band.



91. Close the ear portion (A) of the band with commercially available pincers Oetiker 1098 or equivalent (B).



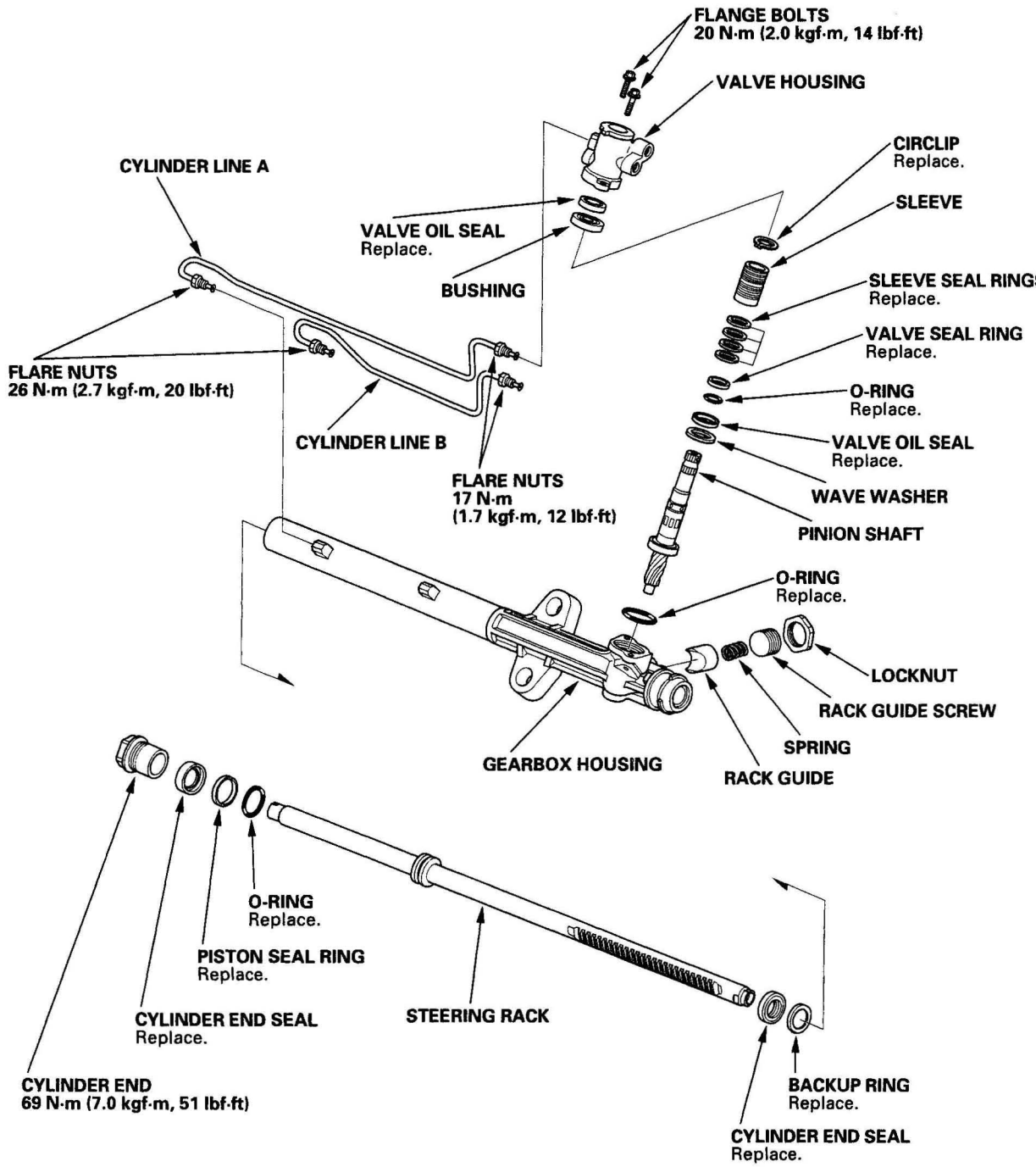
92. Slide the rack right and left to be certain that the boots are not deformed or twisted.

Protected by AR

Steering Gearbox Overhaul (cont'd)

Exploded View

'02-03 Type-S models:



BACK

Protected by AR

Special Tools Required
- Cylinder end seal remover attachment 07NAD-SR3020A
- Pilot collar 07GAF-PH70100
- Piston seal ring sizing tool 07NAG-SR3090A
- Ball joint boot clip guide 07974-SA50800
- Sleeve seal ring sizing tool 07974-SA5020A or 07974-SA50200
- Attachment, 32 x 35 mm 07746-0010100
- Driver 07749-0010000
- Piston seal ring guide 07HAG-SF10100 or 07HAG-SF1010A
- Piston seal ring sizing tool 07HAG-SF1020A or 07HAG-SF10200
- Pincers, Oetiker 1098 or equivalent, commercially available.

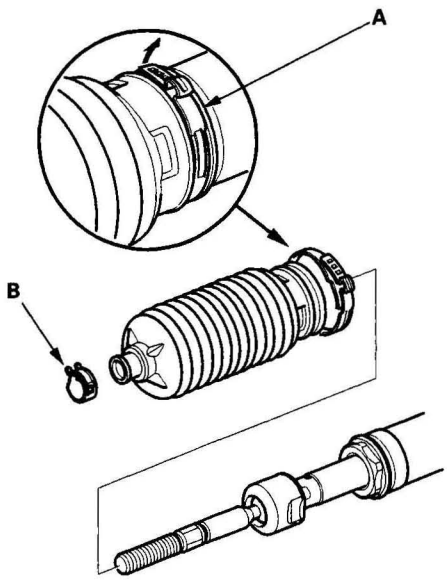
NOTE: Refer to the Exploded View as needed during this procedure.

Removal

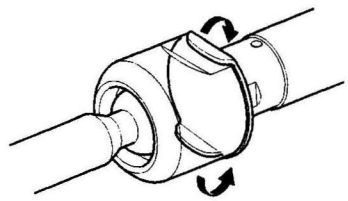
1. Remove the steering gearbox (see page 17-35).

Disassembly

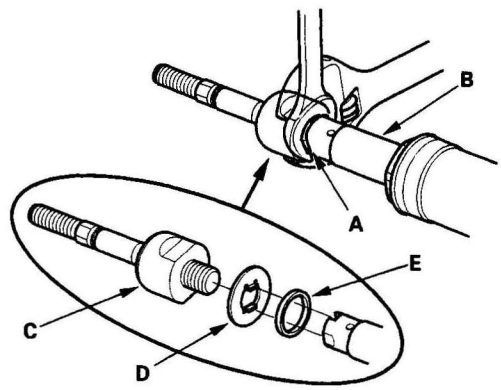
2. Remove the boot bands (A) and tie-rod clips (B). Pull the boots away from the ends of the gearbox.



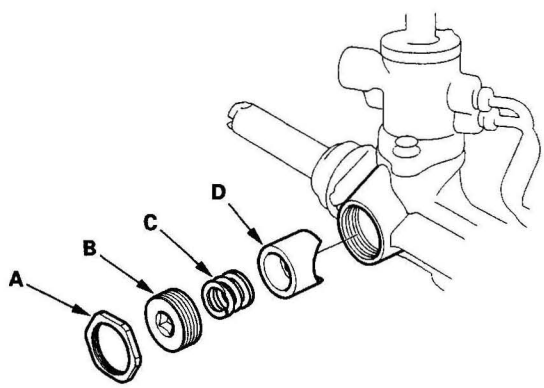
3. Unbend the lock washer.



4. Hold the flat surface sections (A) of the right side steering rack (B) with a wrench, and unscrew the both rack ends (C) with a wrench. Be careful not to damage the rack surface with the wrench. Remove the lock washer (D) and stop washer (E).



5. Loosen the locknut (A), then remove the rack guide screw (B).



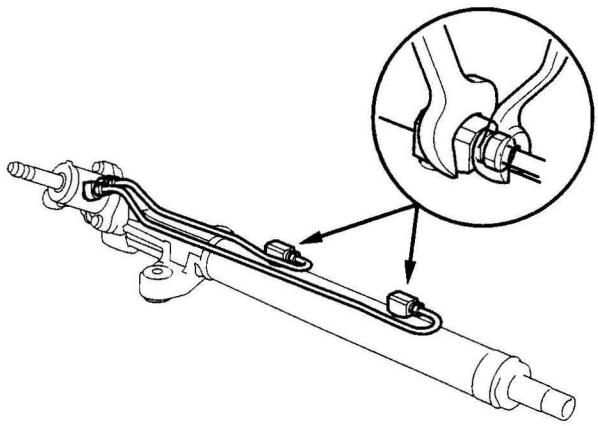
6. Remove the spring (C) and the rack guide (D) from the gearbox.

(cont'd)

Protected by AR

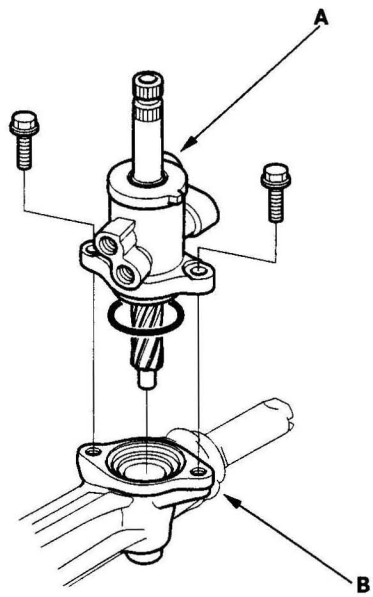
Steering Gearbox Overhaul (cont'd)

7. Remove the cylinder lines from the gearbox.

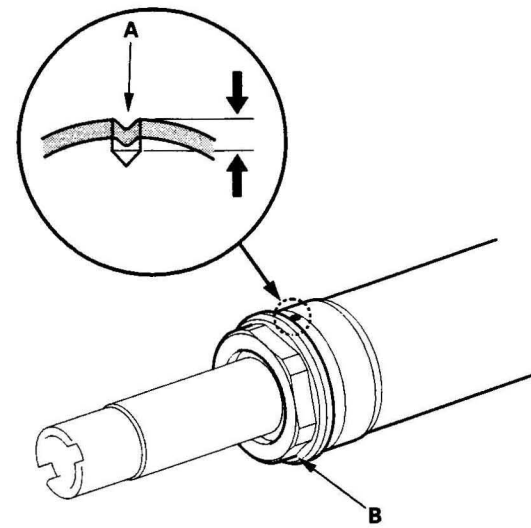


8. Drain the fluid from the cylinder fittings by slowly moving the steering rack back and forth.

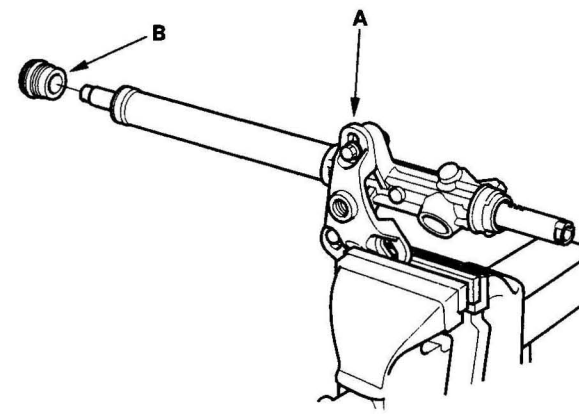
9. Remove the two flange bolts, then remove the valve body unit (A) from the gearbox (B).



10. Drill a 3 mm (0.12 in.) diameter hole approximately 2.5–3.0 mm (0.10–0.12 in.) in depth in the staked point (A) on the cylinder. Do not allow metal shavings to enter the cylinder housing. After removing the cylinder end (B), remove any burrs at the staked point.



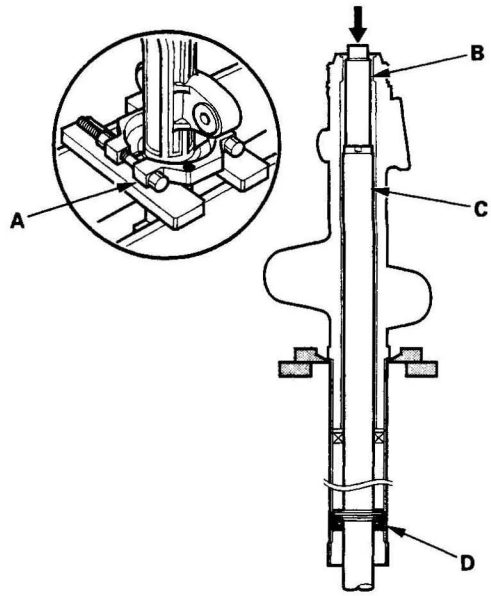
11. Attach the yoke of a universal puller (A) to the steering gearbox mounts with bolts. Clamp the yoke in a vise with soft jaws as shown, then loosen and remove the cylinder end (B). Do not clamp the cylinder housing or gearbox housing in the vise.



BACK

Protected by AR

12. Install the bearing separator (A) on the gearbox housing as shown.

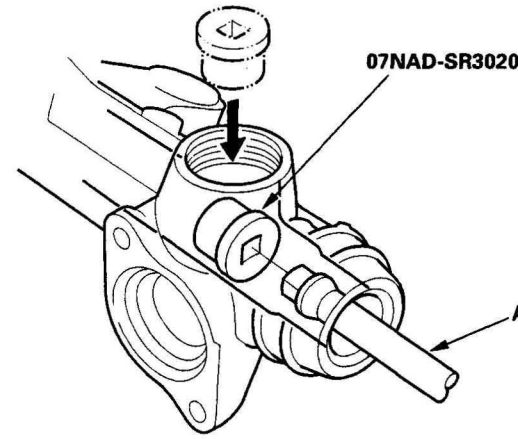


13. Place a appropriate size deep socket wrench (B) on the steering rack (C).

14. Set the steering gearbox in a press so the left side points upward, then press the cylinder end seal (D) and steering rack out of the gearbox. Hold the steering rack to keep it from falling when pressed clear. Be careful not to damage the inner surface of the cylinder housing with the tool.

15. Remove the cylinder end seal from the steering rack.

16. Insert a 24" long, 3/8" drive extension (A) and the special tool into the cylinder from the left side. Make sure that the special tool is securely positioned on the backup ring edges. Be careful not to damage the inner surface of the cylinder with the special tool.



(cont'd)

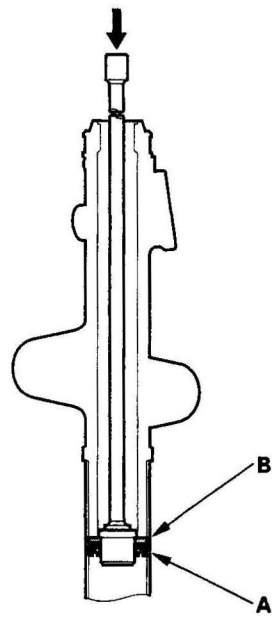
Protected by AR

Steering Gearbox Overhaul (cont'd)

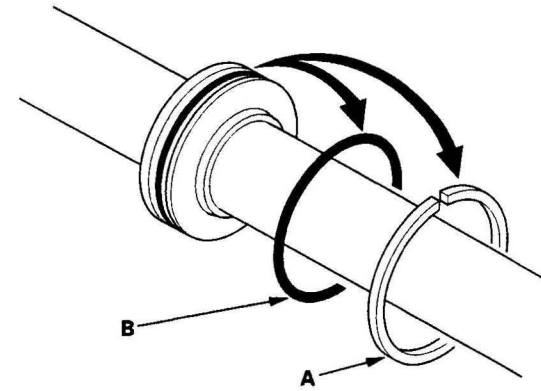
17. Set the gearbox in a press, then press out the cylinder end seal (A) and backup ring (B) from the gearbox.

    Note these items when pressing the cylinder end seal:

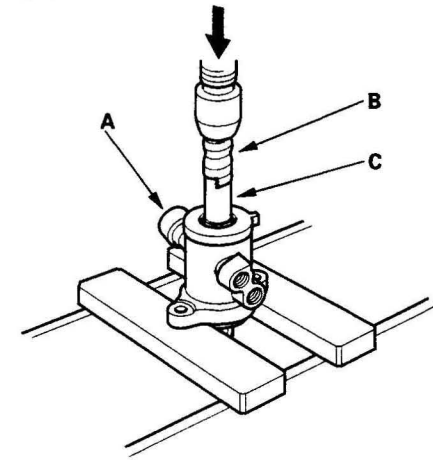
    - Keep the tool straight to avoid damaging the cylinder wall. Check the tool angle, and correct it if necessary, when removing the cylinder end seal.
    - Use a press to remove the cylinder end seal. Do not try to remove the seal by striking the tool. It will break the backup ring, and the cylinder end seal will remain in the gearbox.



18. Carefully pry the piston seal ring (A) and O-ring (B) off the rack piston. Be careful not to damage the inside of the seal ring groove and piston edges when removing the seal ring.



19. Before removing the valve housing (A), apply vinyl tape (B) to the splines on the pinion shaft (C).



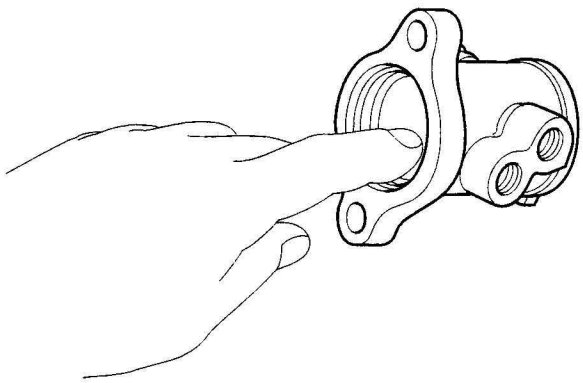
20. Separate the valve housing from the pinion shaft/valve using a press.

BACK

Protected by AR

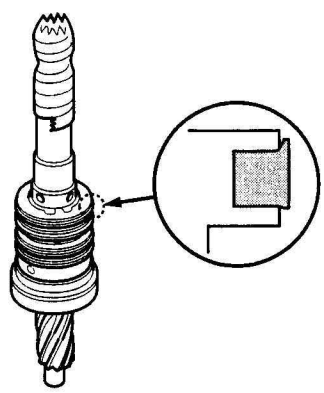
21. With your finger check the inner wall of the valve housing where the seal ring slides. If there is a step in the wall, the housing is worn. Replace it.

    NOTE: There may be sliding marks from the seal ring on the wall of the valve housing. Replace the valve housing only if the wall is stepped.

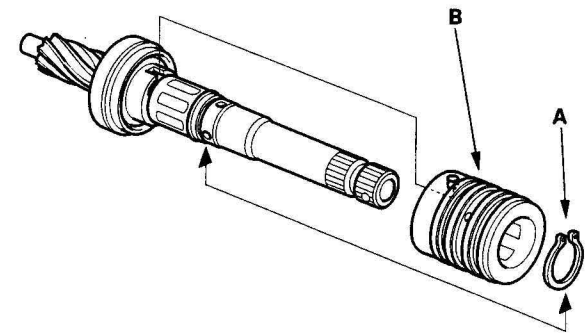


22. Check for wear, burrs and other damage to the edges of the grooves in the sleeve.

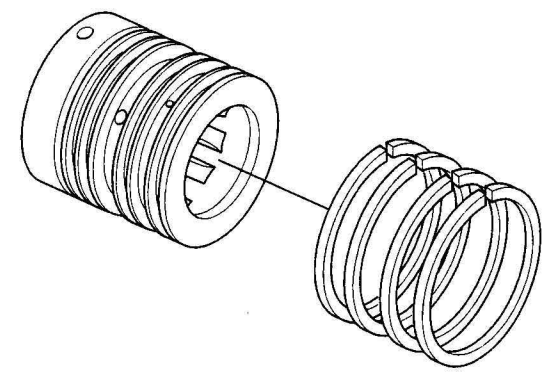
    NOTE: The pinion shaft and sleeve are a precision matched set. If either the pinion shaft or sleeve must be replaced, replace both parts as a set.



23. Remove the circlip (A) and sleeve (B) from the pinion shaft.



24. Using a cutter or an equivalent tool, cut and remove the four seal rings from the sleeve. Be careful not to damage the edges of the sleeve grooves and outer surface when removing the seal rings.

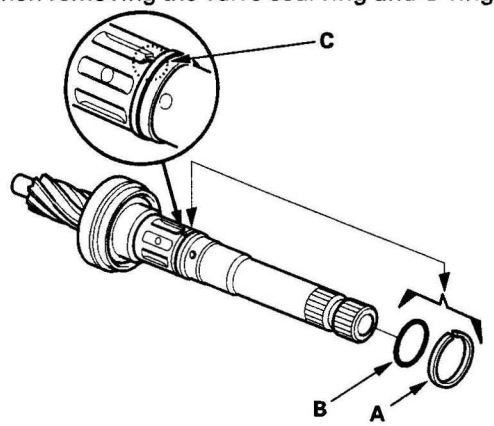


(cont'd)

Protected by AR

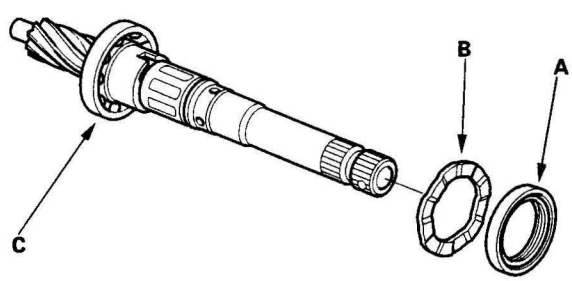
Steering Gearbox Overhaul (cont'd)

25. Using a cutter or an equivalent tool, cut the valve seal ring (A) and O-ring (B) at the cutting groove position (C) in the pinion shaft. Remove the valve seal ring and O-ring. Be careful not to damage the edges of the pinion shaft groove and outer surface when removing the valve seal ring and O-ring.

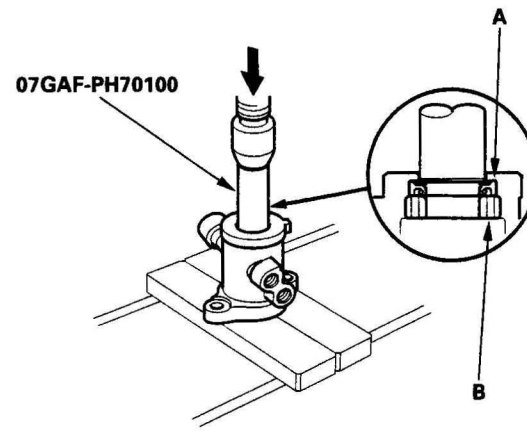


26. Remove the valve oil seal (A) and wave washer (B) from the pinion shaft.

    Note these items during disassembly:
    - Inspect the ball bearing (C) by rotating the outer race slowly. If there is any excessive play or wear, replace the pinion shaft and sleeve as an assembly.
    - The pinion shaft and sleeve are a precise fit; do not intermix old and new pinion shafts and sleeves.



27. Press the valve oil seal (A) and bushing (B) out of the valve housing using a hydraulic press and special tool.



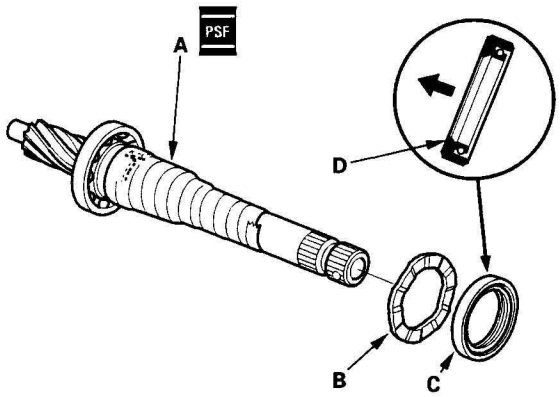
28. Clean the disassembled parts with solvent, and dry them with compressed air. Do not dip rubber parts in the solvent.

BACK

Protected by AR

Reassembly

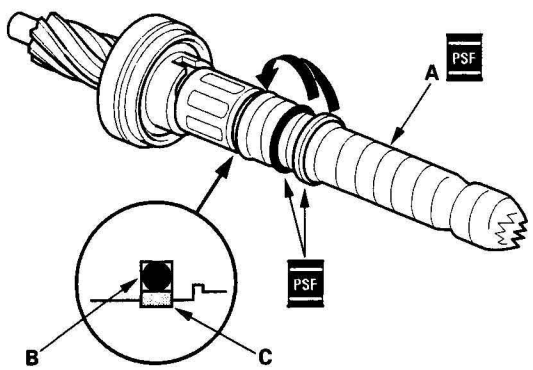
29. Apply vinyl tape (A) to the stepped portion of the pinion shaft, and coat the surface of the vinyl tape with the power steering fluid.



30. Install the wave washer (B).

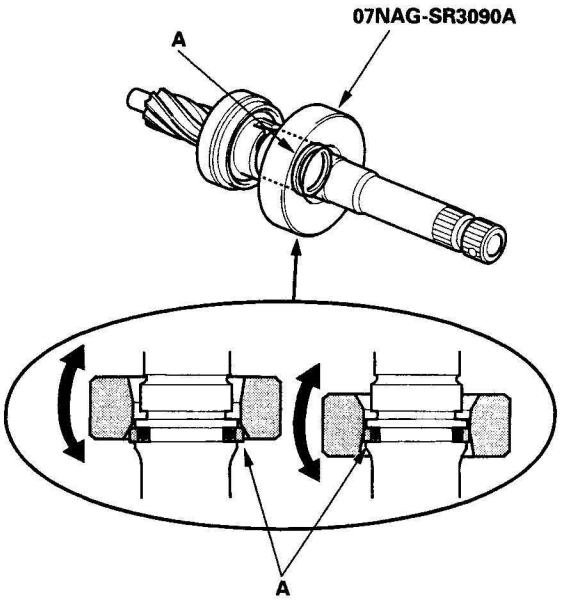
31. Coat the inside surface of the new valve oil seal (C) with power steering fluid, and install the seal with its grooved side facing opposite the bearing, then slide it over the pinion shaft, being careful not to damage its sealing lip (D).

32. Apply vinyl tape (A) to the splines and stepped portion of the shaft, and coat the surface of the vinyl tape with the power steering fluid.



33. Fit the new O-ring (B) in the groove of the pinion shaft. Then slide the new valve seal ring (C) over the shaft and in the groove on the pinion shaft.

34. Remove the tape, and apply power steering fluid to the surface of the valve seal ring (A).



35. Apply power steering fluid to the inside of the special tool. Set the larger diameter end of the special tool over the valve seal ring, and move the special tool up and down several times to make the valve seal ring fit in the pinion shaft groove.

36. Remove the special tool, turn it over, slide the smaller diameter end over the valve seal ring. Move it up and down several times to make the valve seal ring fit snugly in the pinion shaft groove.

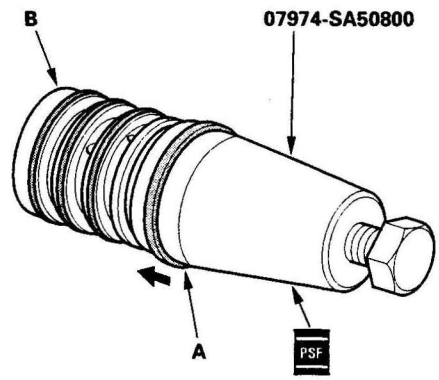
(cont'd)

Protected by AR

Steering Gearbox Overhaul (cont'd)

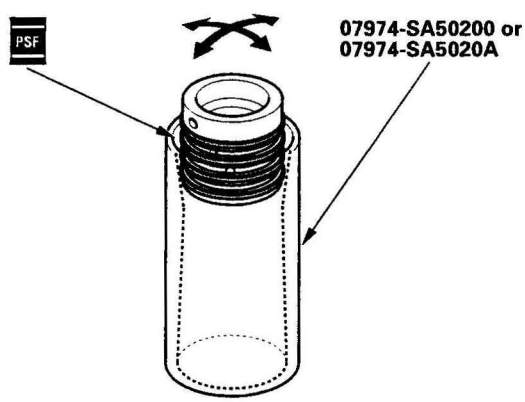
37. Apply power steering fluid to the surface of the special tool. Slip two new seal rings (A) over the special tool from the smaller diameter end, and expand them. Install only two rings at a time from each end of the pinion shaft sleeve (B).

    Note these items when installing the seal ring:
    - Do not over-expand the seal ring. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal rings using the special tool (sizing tool).
    - There are two types of sleeve seal rings: black and brown. Do not mix the different types of rings as they are not compatible.



38. Align the special tool with each groove in the sleeve, and slide a sleeve seal ring into each groove. After installation, compress the seal rings with your fingers temporarily.

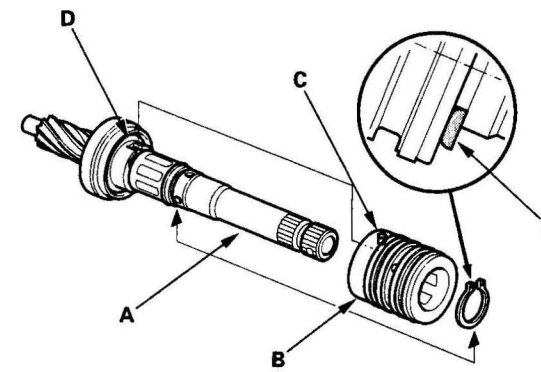
39. Apply power steering fluid to the seal rings on the sleeve, and to the entire inside surface of the special tool, then slowly insert the sleeve into the special tool.



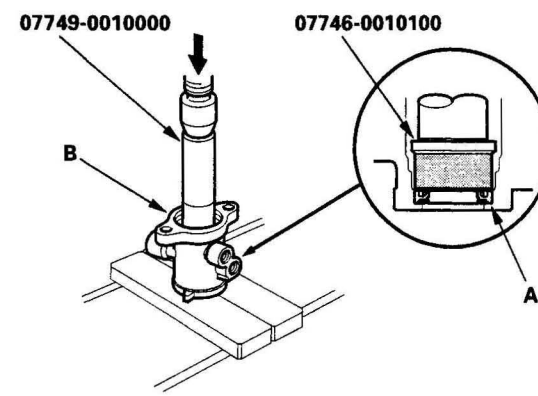
40. Move the sleeve back and forth several times to make the seal rings snugly fit in the sleeve. Be sure that the seal rings are not twisted.

41. Apply power steering fluid to the surface of the pinion shaft (A). Slide the sleeve (B) onto the pinion shaft by aligning the locating pin (C) on the inside of the sleeve with the cutout (D) in the shaft. Then install the new circlip (E) securely in the pinion shaft groove.

    Note these items during reassembly:
    - Be careful not to damage the valve seal ring when inserting the sleeve.
    - Install the circlip with its radiused side facing in.



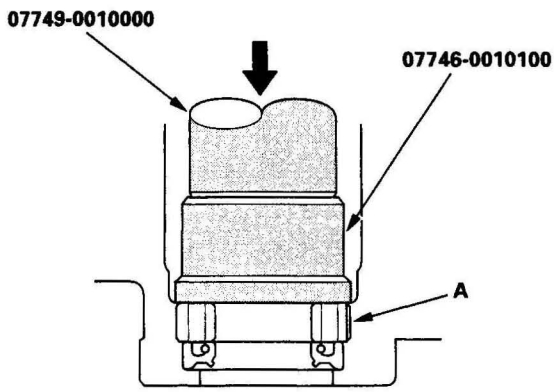
42. Apply power steering fluid to the seal ring lip of the new valve oil seal (A), then install the seal in the valve housing (B) using a hydraulic press and special tools. Install the seal with its grooved side facing the tool.



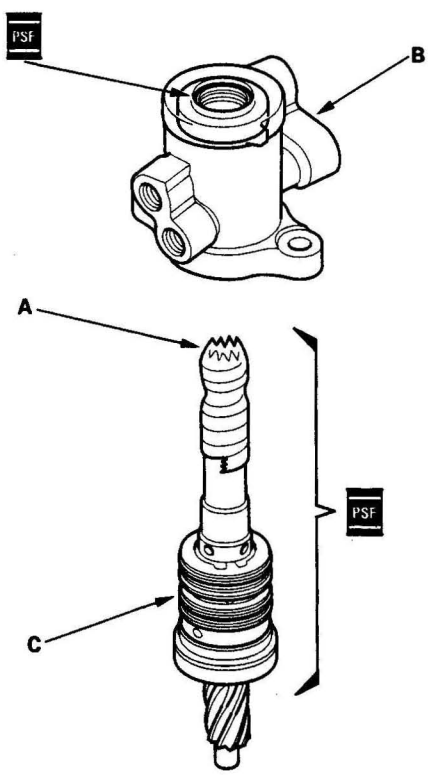
BACK

Protected by AR

43. Press the bushing (A) into the valve housing with a hydraulic press and special tool.



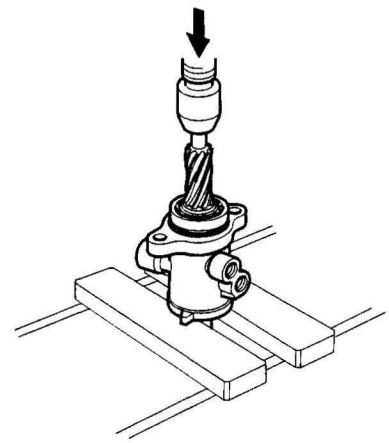
44. Apply vinyl tape (A) to the pinion shaft, then coat the vinyl tape with power steering fluid.



45. Insert the pinion shaft into the valve housing (B). Be careful not to damage the valve seal rings (C).

46. Remove the vinyl tape from the pinion shaft, then remove any residue from the tape adhesive.

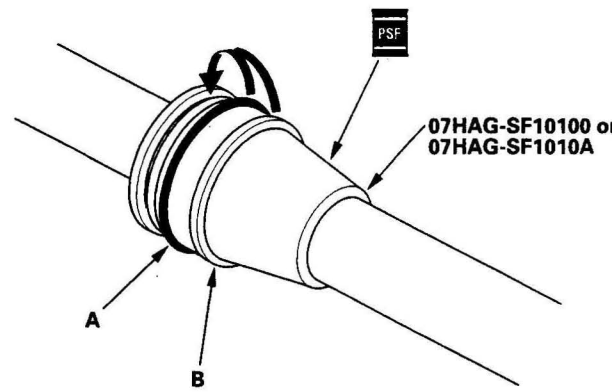
47. Press the pinion shaft/sleeve into the valve housing with a hydraulic press. Check that the pinion shaft/sleeve turns smoothly by hand after installing it.



48. Coat the special tool with power steering fluid, then slide it onto the rack, big end first.

49. Position the new O-ring (A) and new piston seal ring (B) on the special tool, then slide them down toward the big end of the tool.

Note these items during reassembly:
- Do not over expand the resin seal rings. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal ring using the special tool (sizing tool).
- Replace piston's O-ring and seal ring as a set.



50. Pull the O-ring off into the piston groove, then pull the piston seal ring off into the piston groove on top of the O-ring.

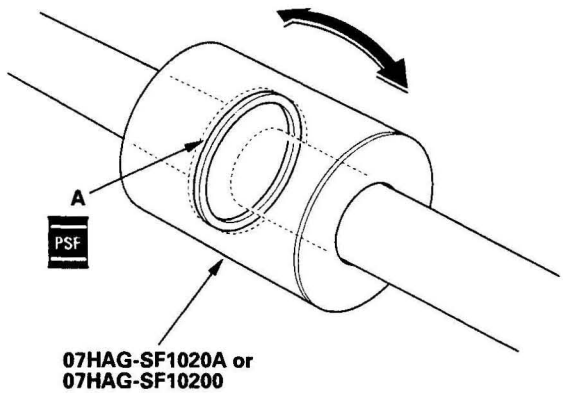
(cont'd)

Protected by AR

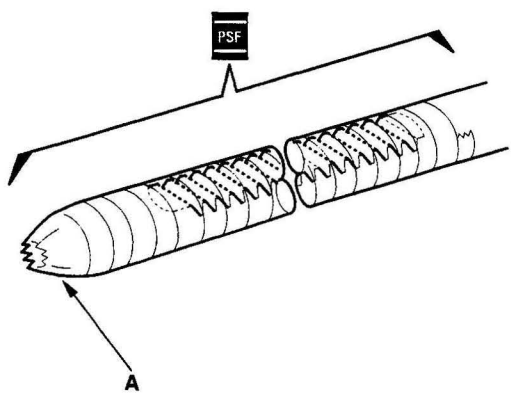
Steering Gearbox Overhaul (cont'd)

51. Coat the piston seal ring (A) and the inside of the special tool with power steering fluid, then carefully slide the tool onto the rack and over the piston seal ring.

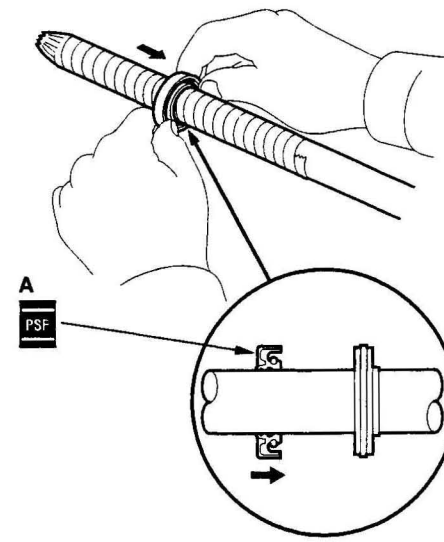
52. Move the special tool back and forth several times to make the piston seal ring fit snugly in the piston.



53. Wrap vinyl tape (A) around the rack teeth and rack end edges, then coat the surface of the tape with power steering fluid. Make sure that the vinyl tape is wrapped carefully so there is no stepped portion.

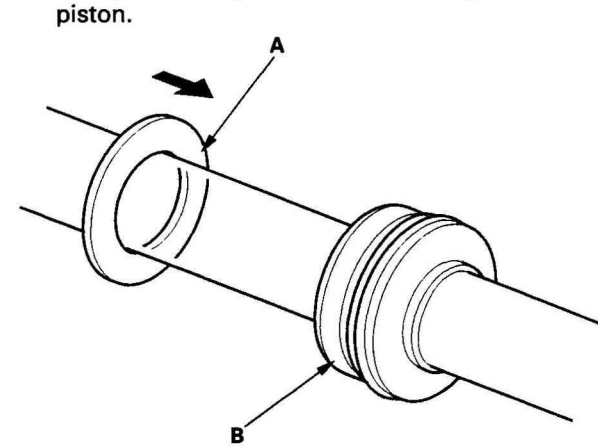


54. Coat the inside surface of the new cylinder end seal (A) with power steering fluid, then install it onto the steering rack with its grooved side toward the piston. When installing the cylinder end seal, be careful not damage the lip of the seal with the edges or teeth of the steering rack.



55. Remove the vinyl tape from the steering rack, then remove any adhesive residue.

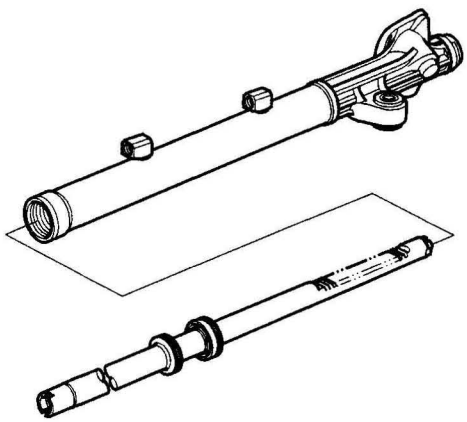
56. Install the new backup ring (A) on the steering rack, then place the cylinder end seal (B) against the piston.



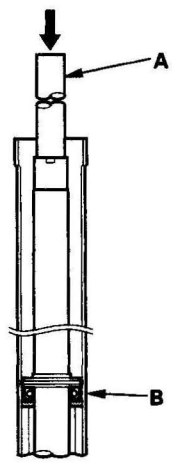
BACK

Protected by AR

57. Grease the steering rack teeth, then insert the steering rack into the gear box housing. Be careful not to damage to inner surface of the cylinder wall with the rack edges.



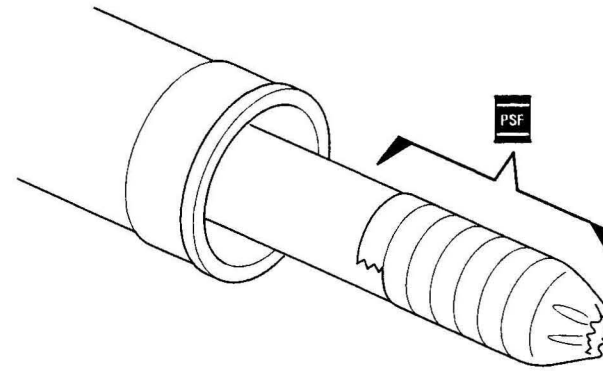
58. Insert an appropriate size deep socket wrench (A) onto the steering rack as shown.



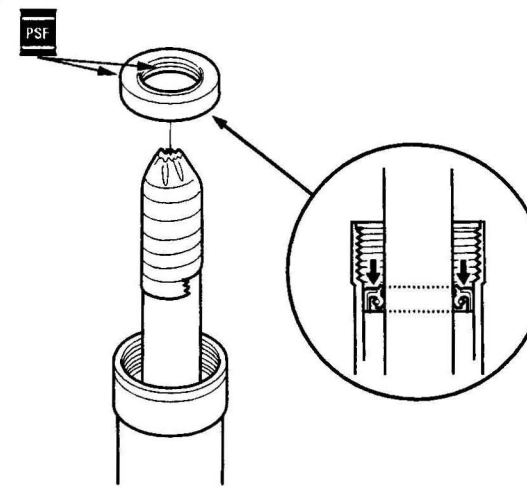
59. Install the cylinder end seal (B) into the bottom of the cylinder by pressing on the tool with a press. Do not push on the tool with excessive force as it may damage the cylinder end seal.

60. Remove the tool, and center the steering rack.

61. Wrap vinyl tape around the rack end edges, and coat the surface of the tape with the power steering fluid. Make sure that the vinyl tape is wrapped carefully so there is no stepped portion.



62. Coat the inside surface of the new cylinder end seal with power steering fluid, then install the seal onto the steering rack with its grooved side toward the piston.



63. Push in the cylinder end seal with your finger.Be careful not to damage the face of the seal with the threads and burrs at the staked position of the cylinder housing.

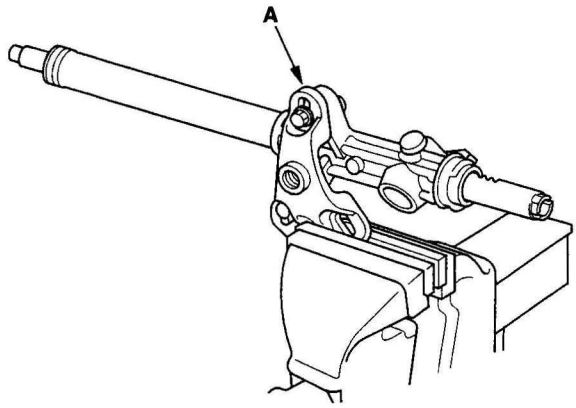
64. Remove the vinyl tape from the steering rack, then remove any adhesive residue.

(cont'd)

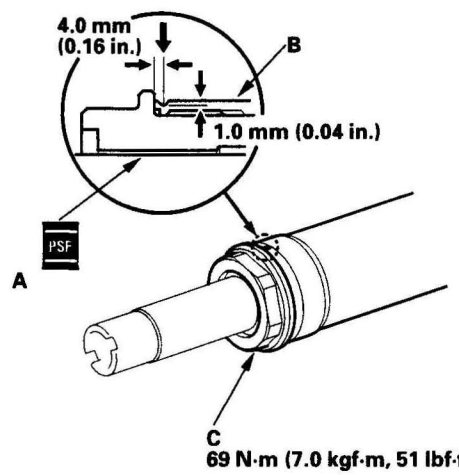
Protected by AR

Steering Gearbox Overhaul (cont'd)

65. Attach the yoke of a universal puller (A) to the steering gearbox mounts with bolts, then clamp the yoke in a vise with soft jaws. Do not clamp the cylinder housing or gearbox housing in the vise.

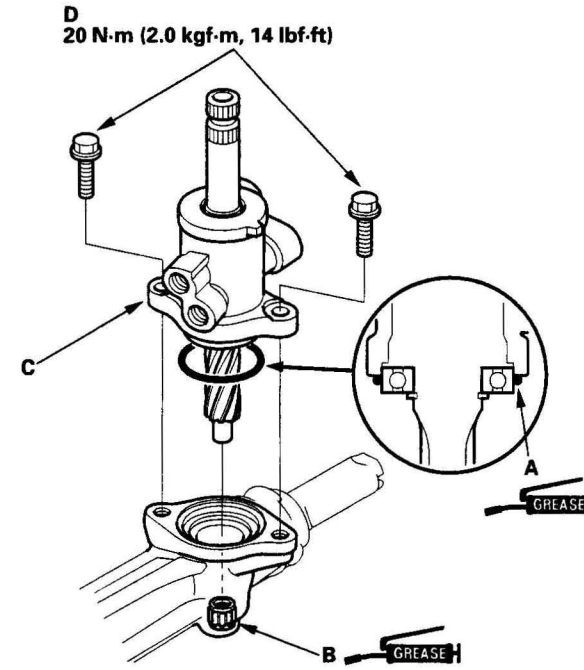


66. Coat the inside surface of the cylinder end (A) with power steering fluid, then install the cylinder end by screwing it into the cylinder (B).



67. Remove the yoke from the gearbox, then, after tightening the cylinder end (C), stake the point of the cylinder shown (opposite from where the stake was removed during disassembly).

68. Coat the new O-ring (A) with grease, and carefully fit it on the valve housing.



69. Apply grease to the needle bearing (B) in the gearbox housing, then install the valve body unit (C) by engaging the gears. Note the valve body unit installation position (direction of the line connections).

70. Tighten the flange bolts (D) to the specified torque.

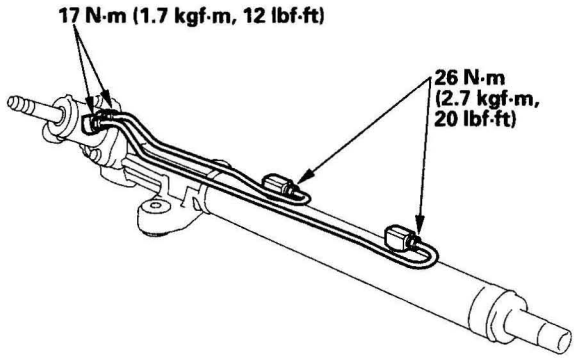
BACK

Protected by AR

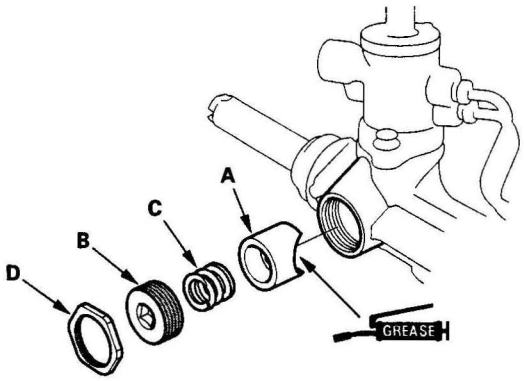
71. Install the cylinder lines.

    Note these items during reassembly:

    - Thoroughly clean the joints of the cylinder lines. The joints must be free of foreign material.
    - Install the cylinder lines by tightening the flare nuts by hand first, then tighten the flare nuts to the specified torque.



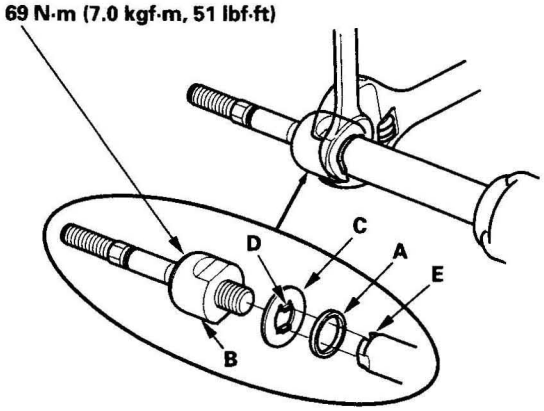
72. Grease the sliding surface of the rack guide (A), and install it onto the gearbox housing.



73. Remove the old sealant from the rack guide screw (B), then apply sealant all around the threads. Install the spring (C), rack guide screw and locknut (D).

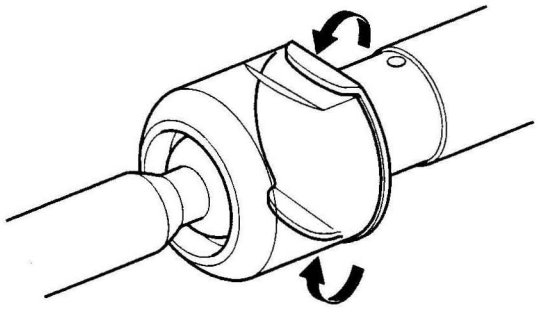
74. Adjust the rack guide screw (see page 17-34). After adjusting, check that the rack moves smoothly by sliding it right and left.

75. Install the stop washer (A), and screw each rack end (B) into the rack while holding the lock washer (C) so its tabs (D) are in the slots (E) in the end of the rack.



76. Hold the flat surface sections of the right side steering rack with a wrench, and tighten the both rack ends. Be careful not to damage the rack surface with the wrench.

77. Bend the lock washer back against the flat spots on the rack end joint housing.

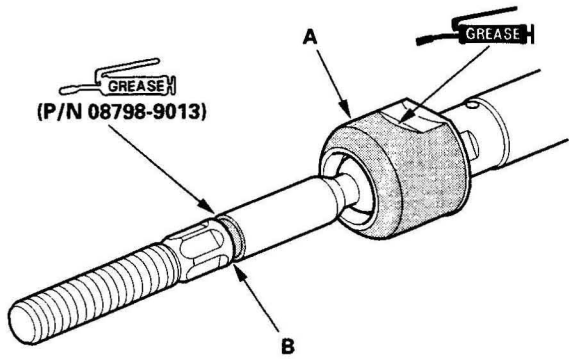


(cont'd)

Protected by AR

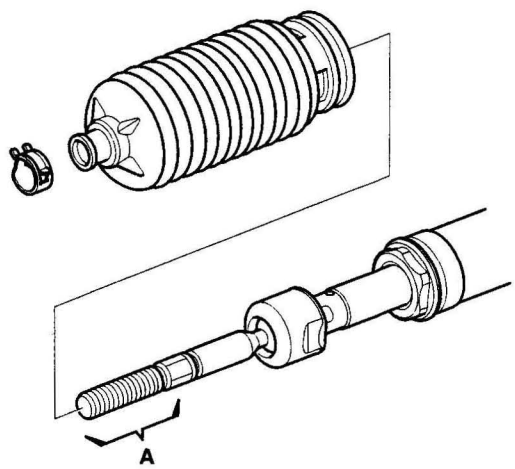
Steering Gearbox Overhaul (cont'd)

78. Apply multipurpose grease to the circumference of the rack end joint housing (A).

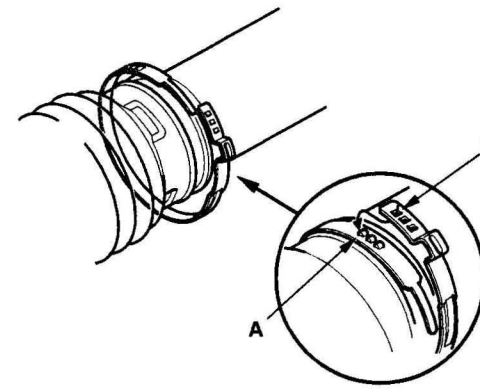


79. Apply a light coat of silicone grease to the boot grooves (B) on the rack end.

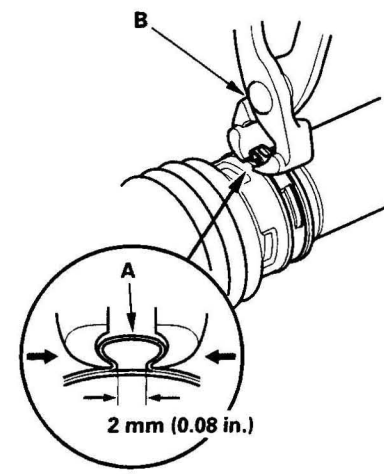
80. Center the steering rack within its stroke. Install the boots on the rack ends with the tie-rod clips. After installing the boots, wipe the grease off the threaded section (A) of the rack end.



81. Install the new boot bands by aligning the tabs (A) with holes (B) of the band.



82. Close the ear portion (A) of the band with commercially available pincers Oetiker 1098 or equivalent (B).



83. Slide the rack right and left to be certain that the boots are not deformed or twisted.

BACK

Protected by AR

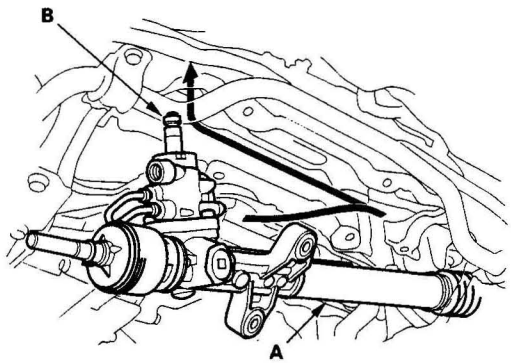
Steering Gearbox Installation

'99-03 Premium models:

1. Before installing the gearbox, slide the rack all the way to right.

   NOTE: Apply vinyl tape to the pinion shaft splines and the line fitting surfaces on the valve body unit to protect them from the rearbeam during installation.

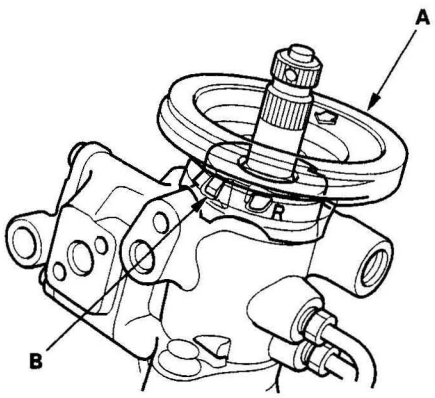
2. Pass the passenger's side of the steering gearbox (A) above and through the passenger's side of the rear beam. Be careful not to bend or damage the power steering lines and cylinder lines when installing the gearbox.



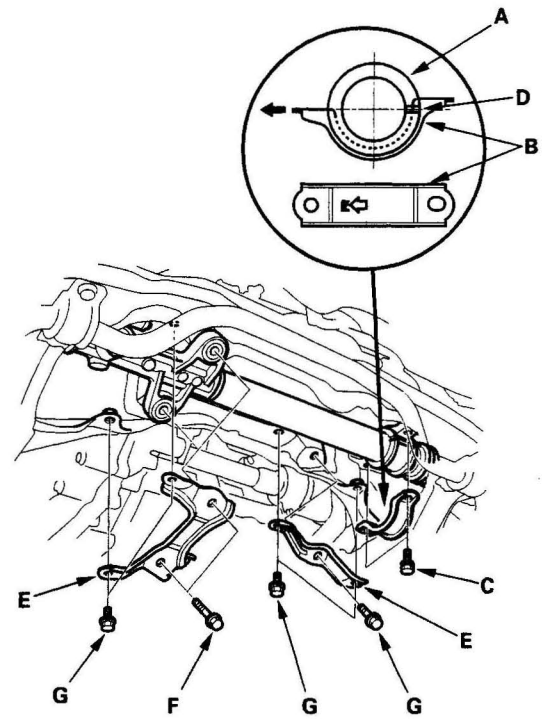
3. Raise the driver's side of the steering gearbox above and through the driver's side of the rear beam. Then insert the pinion shaft (B) up through the bulkhead.

4. Remove the vinyl tape from the pinion shaft and the valve body unit.

5. Install the pinion shaft grommet (A). Align the slot (B) in the pinion shaft grommet with the lug portion on the valve housing.



6. Install the mounting cushion (A) on the steering gearbox.



C, G: 38 N·m (3.9 kgf·m, 28 lbf·ft)
F: 43 N·m (4.4 kgf·m, 32 lbf·ft)

7. Install the mounting brackets (B) over the mounting cushion, then install the 2 gearbox mounting bolts (C). Position the split portion (D) of the mounting cushion as shown.

8. Install the stiffener plates (E) with the 2 gearbox mounting bolts (F) and 6 stiffener plate attaching bolts (G). Install the bolts loosely first, then tighten them securely.

9. Center the steering rack within its stroke.

(cont'd)

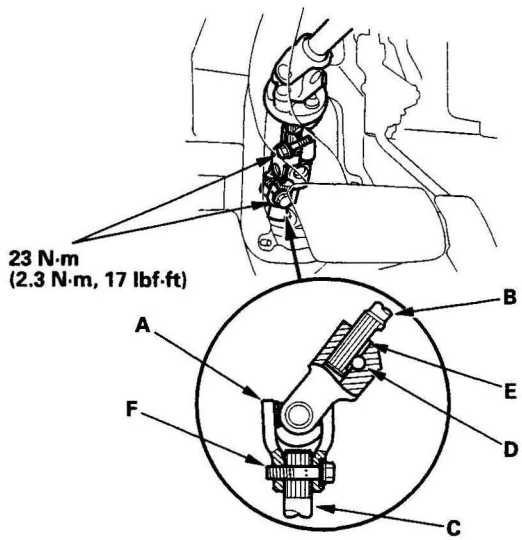
BACK

Protected by AR

Steering Gearbox Installation (cont'd)

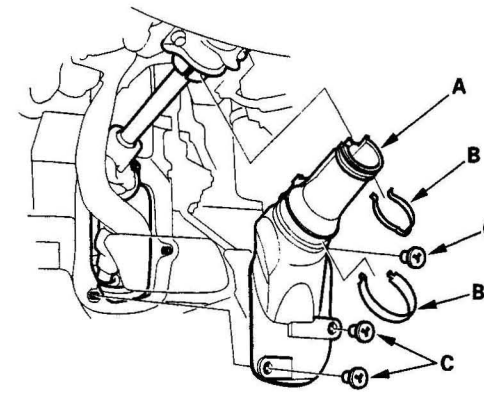
10. Install the steering joint (A), and reconnect the steering shaft (B) and pinion shaft (C). Make sure the steering joint is connected as follows:

    - Insert the upper end of the steering joint onto the steering shaft (line up the bolt hole (D) with the flat portion (E) on the shaft).
    - Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole (F) with the groove around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.
    - Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it.

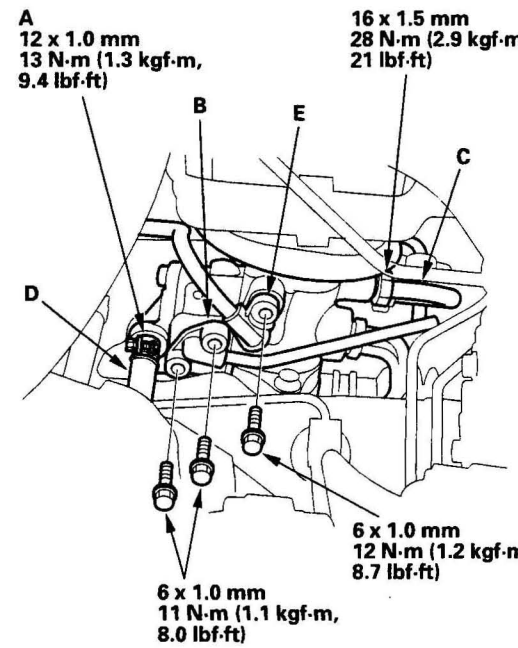


11. Center the cable reel by first rotating it clockwise until it stops. Then rotate it counterclockwise (approximately 2 and half turns) until the arrow mark on the label points straight up. Reinstall the steering wheel (see page 17-29).

12. Install the steering joint cover (A) with the clamps (B) and clips (C).



13. Install the sensor inlet hose fitting (A).

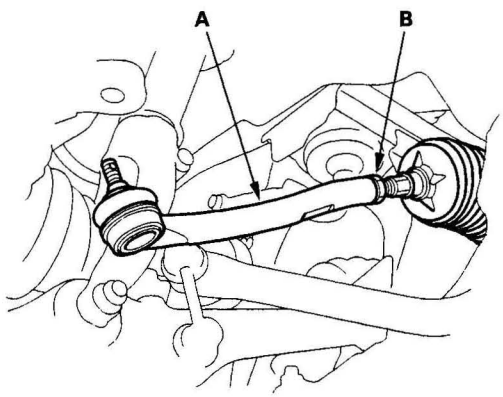


14. Connect the supply line (B), the return line (C), the sensor inlet hose (D), and the sensor return line (E) to the valve body unit.

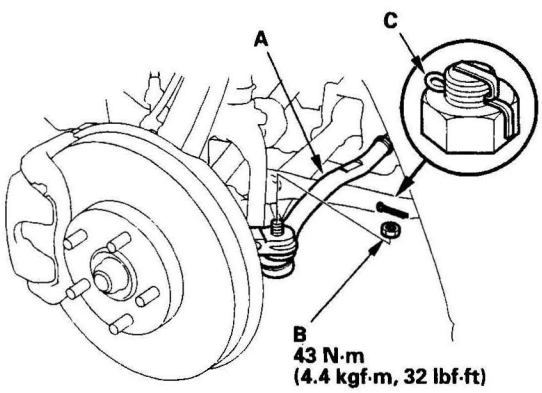
BACK

Protected by AR

15. Thread the right and left tie-rod ends (A) and locknut (B) onto the rack an equal number of turns.

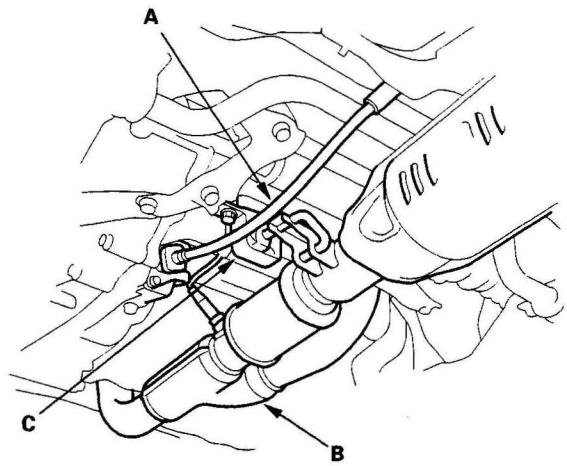


16. Wipe off any grease contamination from the ball joint tapered section and threads then reconnect tie-rod ends (A) to the steering knuckles. Install the 10 mm nut (B) and tighten it.



17. Install the new cotter pin (C) and bend it as shown.

18. '99 model: Connect the A/T shift cable (A) (see page 14-129) to the transmission.
'00-03 models: Connect the A/T shift cable (A) (see page 14-370) to the transmission.



19. Install the exhaust pipe (B) and mounting bracket (C) (see page 9-12).

20. Install the front wheels.

21. Fill the system with power steering fluid, and bleed air from the system (see page 17-18).

22. After installation, perform the following checks.

- Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid. Check the gearbox for leaks (see page 17-14).
- Adjust the front toe (see page 18-6).
- Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods equally, if necessary.

BACK

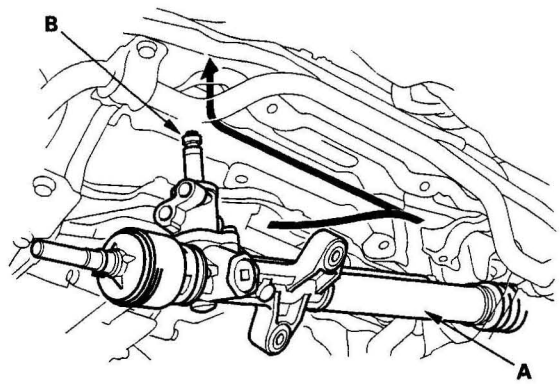
Protected by AR

Steering Gearbox Installation (cont'd)

'02-03 Type-S models:

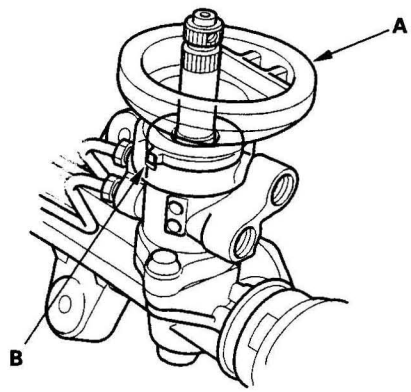
1. Before installing the gearbox, slide the rack all the way to right.

2. Pass the passenger's side of the steering gearbox (A) above and through the passenger's side of the rear beam. Be careful not to bend or damage the power steering lines and cylinder lines when installing the gearbox.

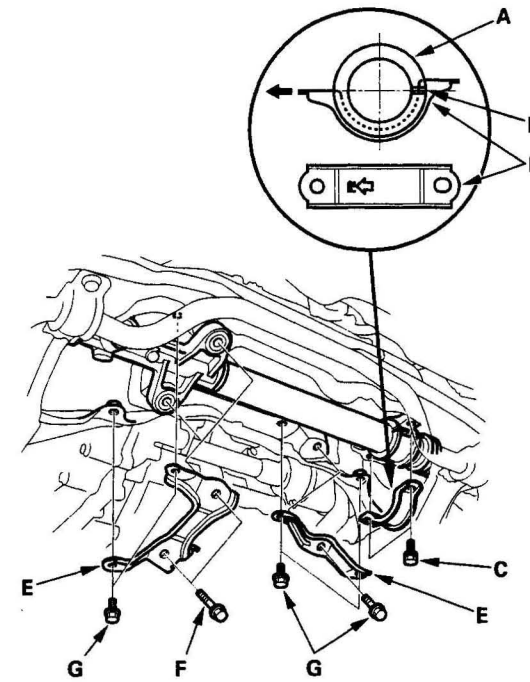


3. Raise the driver's side of the steering gearbox above and through the driver's side of the rear beam. Then insert the pinion shaft (B) up through the bulkhead.

4. Install the pinion shaft grommet (A). Align the slot (B) in the pinion shaft grommet with the lug portion on the valve housing.



5. Install the mounting cushion (A) on the steering gearbox.



C, G: 38 N·m (3.9 kgf·m, 28 lbf·ft)
F: 43 N·m (4.4 kgf·m, 32 lbf·ft)

6. Install the mounting brackets (B) over the mounting cushion, then install the two gearbox mounting bolts (C). Position the split portion (D) of the mounting cushion as shown.

7. Install the stiffener plates (E) with the two gearbox mounting bolts (F) and six stiffener plate attaching bolts (G). Install the bolts loosely first, then tighten them securely.

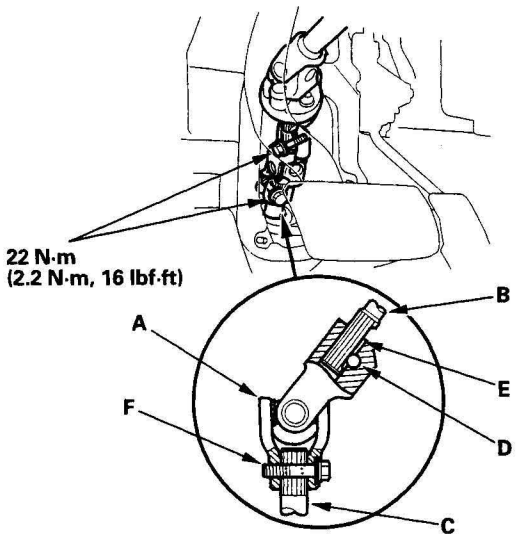
8. Center the steering rack within its stroke.

BACK

Protected by AR

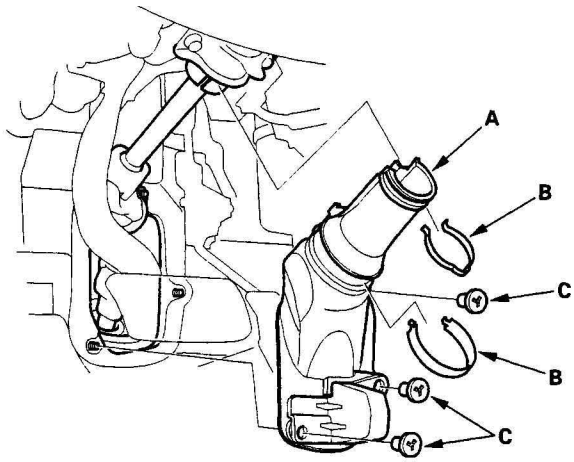
9. Install the steering joint (A), and reconnect the steering shaft (B) and pinion shaft (C). Make sure the steering joint is connected as follows:

   - Insert the upper end of the steering joint onto the steering shaft (line up the bolt hole (D) with the flat portion (E) on the shaft).
   - Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole (F) with the groove around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.
   - Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it.

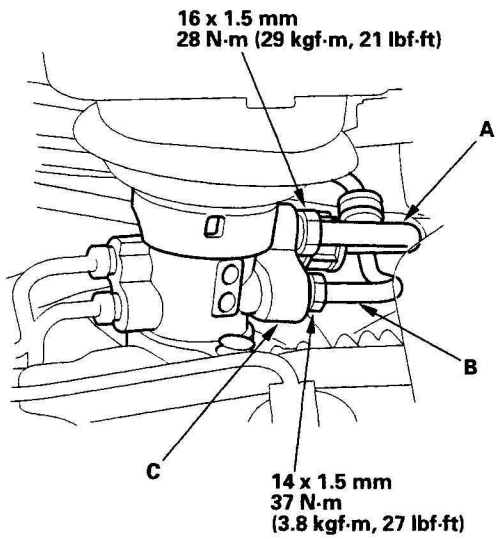


10. Center the cable reel by first rotating it clockwise until it stops. Then rotate it counterclockwise (approximately two and half turns) until the arrow mark on the label points straight up.
    Reinstall the steering wheel (see page 17-29).

11. Install the steering joint cover (A) with the clamps (B) and clips (C).



12. Connect the return line (A) and feed line (B) to the valve body unit (C). After connecting the fluid lines, make sure that there is no interference between the lines and other parts.

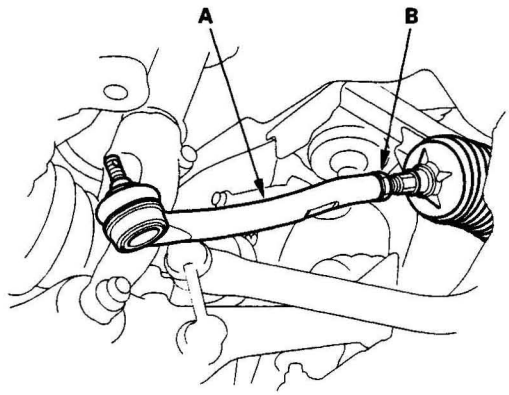


(cont'd)

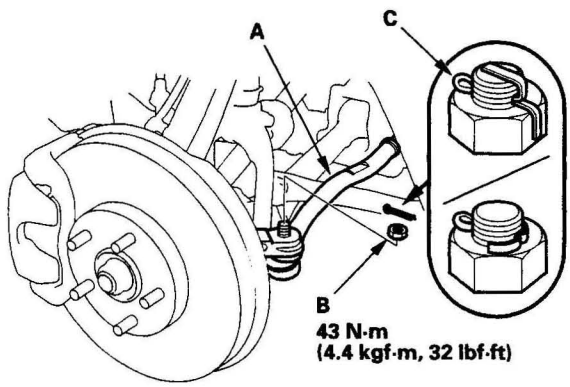
Protected by AR

Steering Gearbox Installation (cont'd)

13. Thread the right and left tie-rod ends (A) and locknut (B) onto the rack an equal number of turns.

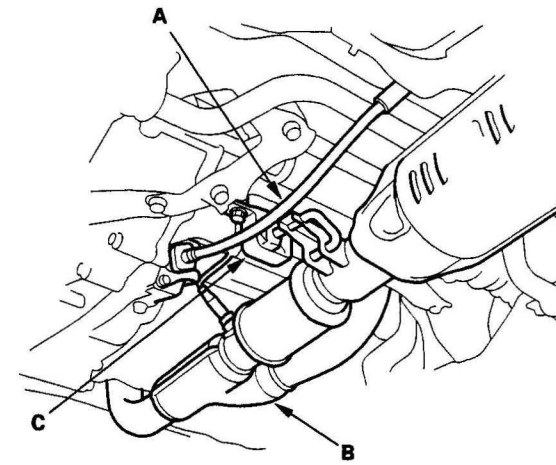


14. Wipe off any grease contamination from the ball joint tapered section and threads then reconnect tie-rod ends (A) to the steering knuckles. Install the 10 mm nut (B) and tighten it.



15. Install the new cotter pin (C) and bend it as shown.

16. Connect the A/T shift cable (see step 12 on page 14-371) to the transmission.



17. Install the exhaust pipe A (B) and mounting bracket B (C) (see page 9-12).

18. Install the front wheels.

19. Fill the system with power steering fluid, and bleed air from the system (see page 17-18).

20. After installation, perform the following checks.

    - Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid. Check the gearbox for leaks (see page 17-14).
    - Adjust the front toe (see page 18-5).
    - Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods equally, if necessary.

BACK

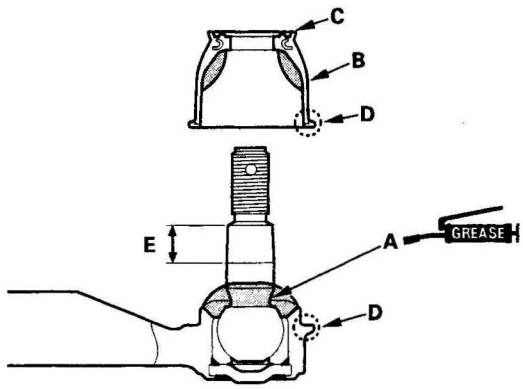
Protected by AR

Tie-rod Ball Joint Boot Replacement

Special Tools Required
Front hub dis/assembly tool 07965-SA50500

1. Remove the boot from the tie-rod end, and wipe the old grease off the ball pin.

2. Pack the lower area of the ball pin (A) with fresh multipurpose grease.

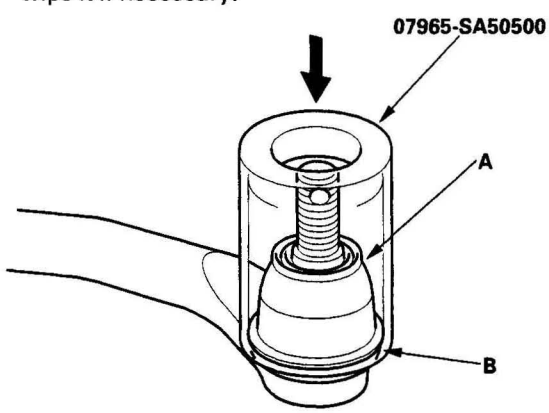


3. Pack the interior of the new boot (B) and lip (C) with fresh multipurpose grease.

   Note these items when installing new grease:

   - Keep grease off the boot installation section (D) and the tapered section (E) if the ball pin.
   - Do not allow dust, dirt, or other foreign materials to enter the boot.

4. Install the new boot (A) using the special tool. The boot must not have a gap at the boot installation sections (B). After installing the boot, check the ball pin tapered section for grease contamination, and wipe it if necessary.



BACK

Protected by AR

Suspension

Front and Rear Suspension

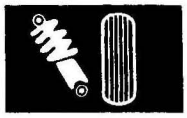
Special Tools 18-2
Component Location Index 18-3
Wheel Alignment 18-5
Wheel Bearing End-Play Inspection 18-8
Wheel Runout Inspection 18-8
Ball Joint Removal 18-9

Front Suspension

Knuckle/Hub Replacement 18-10
Ball Joint Boot Replacement 18-15
Upper Arm Replacement 18-16
Lower Arm Replacement 18-17
Damper/Spring Replacement 18-18

Rear Suspension

Hub/Bearing Unit Replacement 18-22
Knuckle Replacement 18-24
Upper Arm Replacement 18-26
Trailing Arm Replacement 18-27
Leading Arm Replacement 18-27
Lower Arm Replacement 18-28
Control Arm Replacement 18-28
Damper/Spring Replacement 18-29



Protected by AR

Special Tools

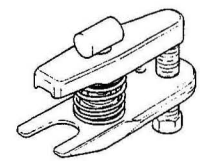
Ref.No.	Tool Number	Description	Qty
①	07GAF-SE00100	Hub Dis/Assembly Tool	1
②	07GAG-SD40700	Ball Joint Boot Clip Guide	1
③	07MAC-SL00200	Ball Joint Remover, 28 mm	1
④	07965-SA00600	Bearing Driver Attachment	1
⑤	07749-0010000	Driver	1
⑥	07947-6340201	Attachment, 58 x 72 mm	1
⑦	07965-SD90100	Support Base	1



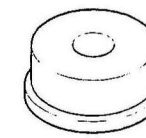
①



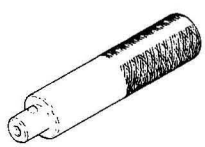
②



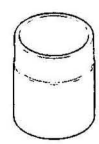
③



④, ⑥



⑤

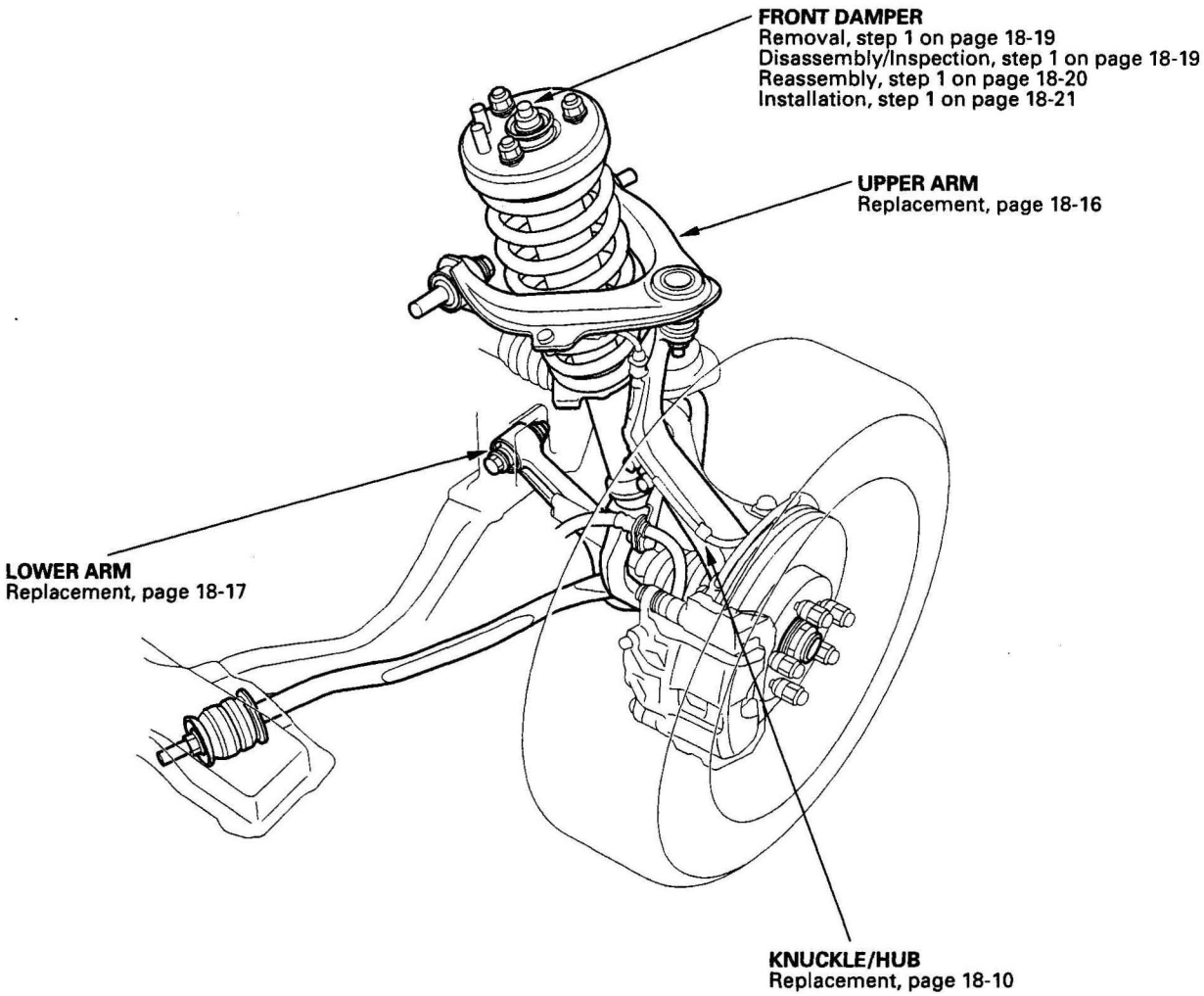


⑦

BACK

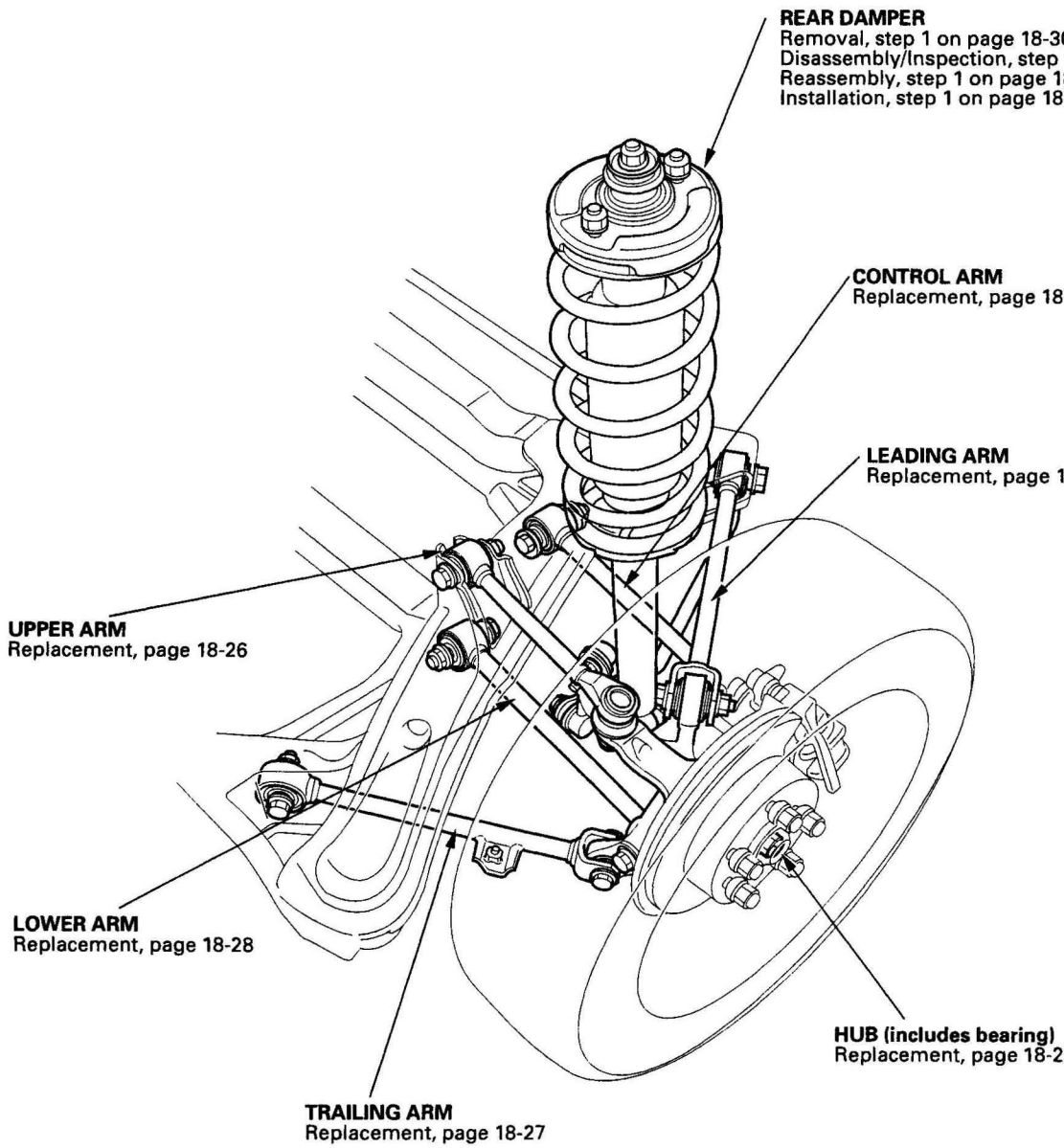
Protected by AR

Component Location Index



Protected by AR

Component Location Index (cont'd)



BACK

Protected by AR

Wheel Alignment

Caster Inspection

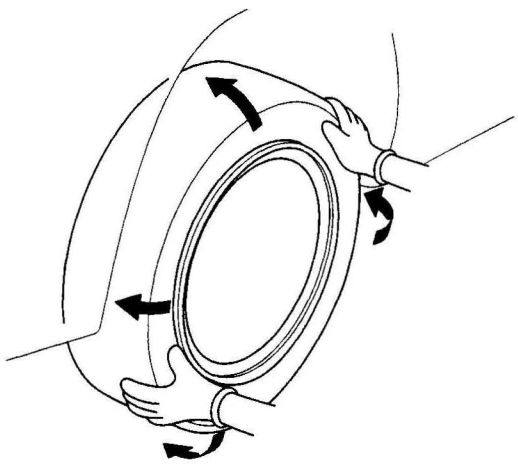
For proper inspection/adjustment of the wheel alignment, check and adjust the following before checking the alignment:

- Check that the suspension is not modified.
- Check the tire size and tire pressure.

Tire size:
Type S: P215/50 R17 93 V
Premium: P205/60 R16 91 V

Tire pressure
Front/Rear: 220 kPa (2.2 kgf/cm², 32 psi)

- Check the runout of the wheels and tires.
- Check the suspension ball joints. (Hold a wheel with your hands and move it up and down and right and left to check for wobbling).



Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Check the caster angle.

   Caster angle: 2°48′ ± 1°

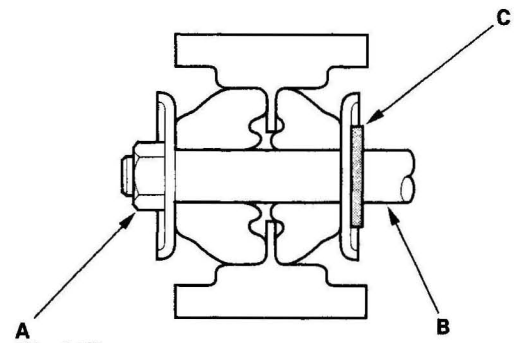
2. If out of specification, record the caster reading, then adjust the caster.

Caster Adjustment

Caster angle can be adjusted by increasing/decreasing the number of the adjusting shims. Remove and install the radius rod each time the caster angle is adjusted.

1. Raise the front of the vehicle, and make sure it is securely supported.

2. Remove the self-locking nut (A) on the end of the radius rod (B).



A
12 x 1.25 mm
54 N·m (5.5 kgf·m, 40 lbf·ft)

3. Remove the flange bolts at the radius rod (B) on the lower arm, and remove the radius rod (see page 18-17).

4. Adjust the caster angle by increasing/decreasing the adjusting shims (C).

   Note these items during adjustment:

   - Do not use more than two adjusting shims.
   - One adjusting shim changes the caster angle by 35′ and the caster angle can be adjusted by 1°10′ maximum.
   - One adjusting shim is 3.2 mm (0.13 in) in thickness.

5. After the adjustment, install the radius rod onto the lower arm, and tighten the flange bolts (see page 18-17).

6. Tighten the new self-locking nut to specified torque.

(cont'd)

BACK

Protected by AR

Wheel Alignment (cont'd)

Camber Inspection

Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Check the camber angle.

   Camber angle:
   Front: 0°00′ ± 1°
   Rear: −0°30′ ± 30′

2. If out of specification, check for bent or damaged suspension components.

Front Toe Inspection/Adjustment

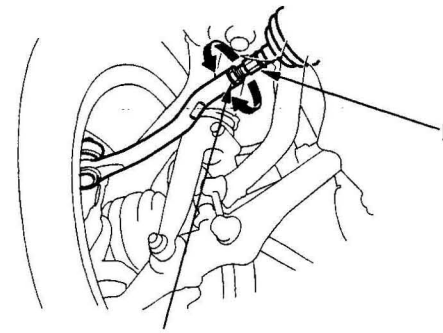
Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Check the tire pressure.
2. Center steering wheel spokes.
3. Check the toe with the wheels pointed straight ahead.

   Front Toe-in: 0 ± 2 mm (0 ± 1/16 in.)

   - If adjustment is required, go on to step 4.
   - If no adjustment is required, remove alignment equipment.

4. Loosen the tie-rod locknuts (A), and turn the tie-rods until the toe is within specification and the measurements are the same for the left and right wheels.



5. After adjusting, tighten the tie-rod locknuts. Reposition the tie-rod boot if it is twisted or displaced.

BACK

Protected by AR

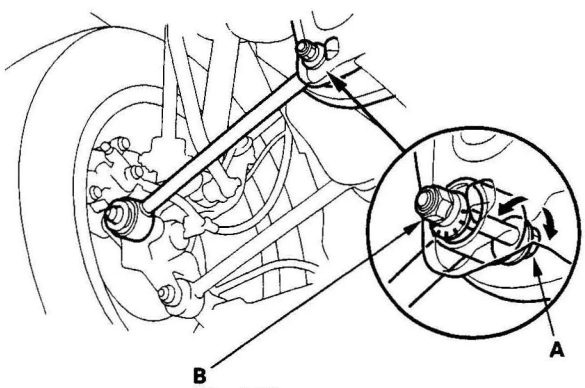
Rear Toe Inspection/Adjustment

Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Release the parking brake to avoid an incorrect measurement.
2. Check the toe.

   Rear Toe-in: 2±2 mm (1/16±1/16 in.)

   - If adjustment is required, go to step 3.
   - If no adjustment is required, remove alignment equipment.
3. Hold the adjusting bolt (A) on the rear control arm, and loosen the self-locking nut (B).



B
10 x 1,25 mm
54 N·m (5.5 kgf·m, 40 lbf·ft)

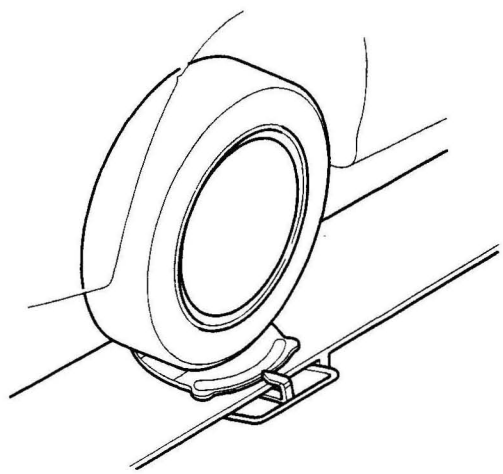
4. Adjust the rear toe by turning the adjusting bolt until toe is correct.
5. Install the self-locking nut, and tighten it while holding the adjusting bolt.

Turning Angle Inspection

Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and/or turning angle). Follow the equipment manufacturer's instructions.

1. Turn the wheel right and left while applying the brake, and measure the turning angle of both wheels.

   Turning angle:
   Inward wheel:
   Type S: 35°16′±2°
   Premium: 38°32′±2°
   Outward wheel (reference):
   Type S: 29°13′
   Premium: 31°03′



2. If the turning angle is not within the specifications, check for bent or damaged suspension components.

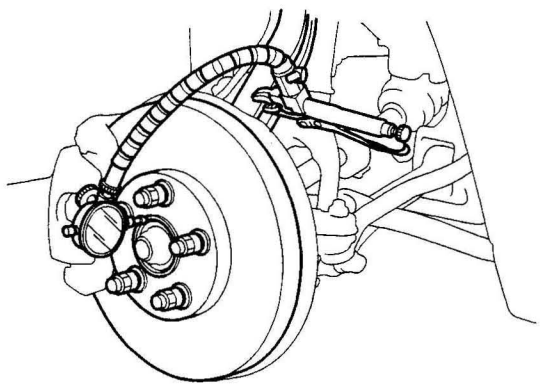
Protected by AR

Wheel Bearing End Play Inspection

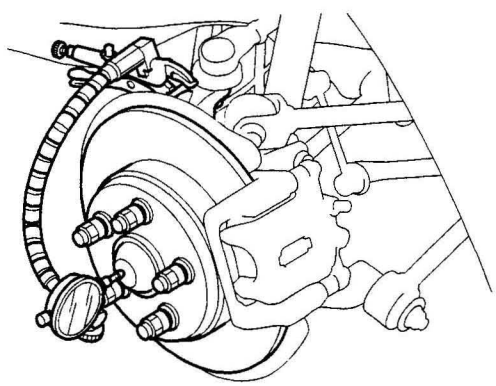
1. Raise the vehicle, and make sure it is securely supported.
2. Remove the wheels, then reinstall the wheel nuts.
3. Attach the dial gauge. On the front, place the dial gauge against the hub flange. On the rear, place the dial gauge against the center of the hub cap.

Front/Rear:
Standard: 0—0.05 mm (0—0.002 in.)

Front:



Rear:

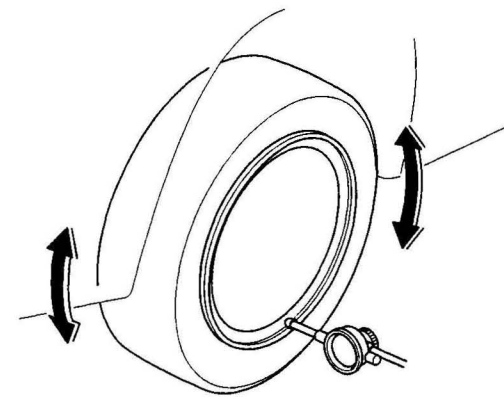


4. Measure the bearing end play moving the disc inward or outward.
5. If the bearing end play measurement is more than the standard, replace the wheel bearing.

Wheel Runout Inspection

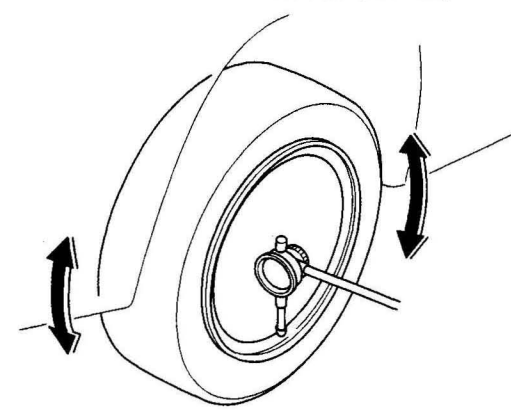
1. Raise the vehicle, and make sure it is securely supported.
2. Check for bent or deformed wheels.
3. Set up the dial gauge, and measure axial runout by turning the wheel.

Front and Rear Wheel Axial Runout:
Standard:
Aluminum Wheel: 0—0.7 mm (0—0.03 in.)
Service Limit: 2.0 mm (0.08 in.)



4. Readjust the dial gauge to the position shown, and measure radial runout.

Front and Rear Wheel Radial Runout:
Standard:
Aluminum Wheel: 0—0.7 mm (0—0.03 in.)
Service Limit: 1.5 mm (0.06 in.)



5. If the wheel runout is more than the service limit, replace the wheel.

BACK

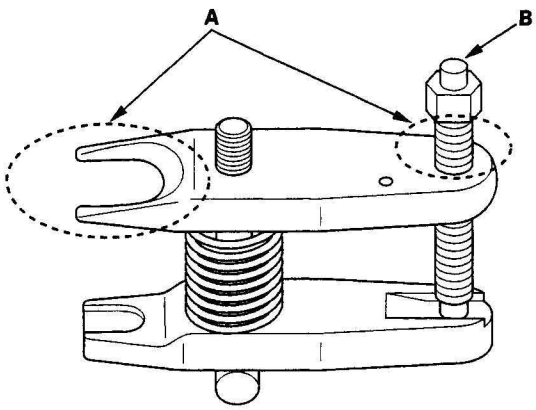
Protected by AR

Ball Joint Removal

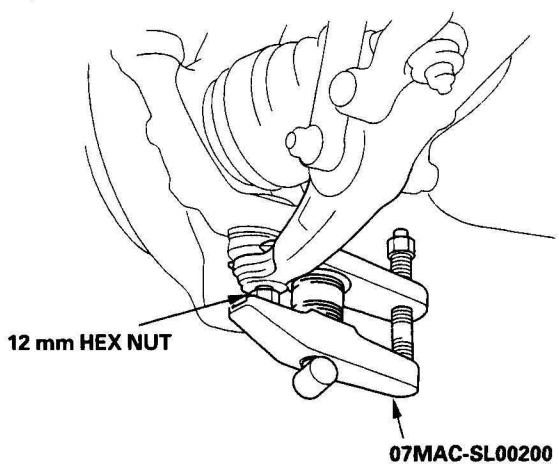
Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

1. Install a hex nut onto the threads of the ball joint. Make sure the nut is flush with the ball joint pin end to prevent damage to the threads end of the ball joint.

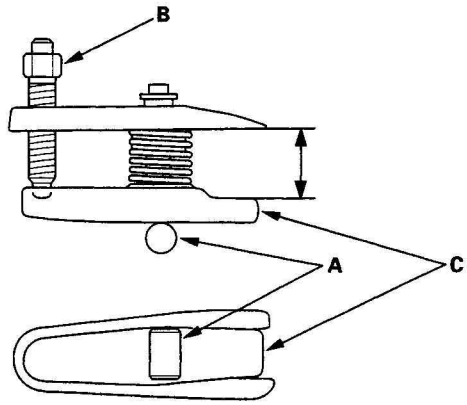
2. Apply grease (A) to the special tool on the areas shown. This will ease installation of the tool and prevent damage to the pressure bolt (B) threads.



3. Install the special tool as shown. Insert the jaws carefully, making sure you do not damage the ball joint boot. Adjust the jaw spacing by turning the pressure bolt.



4. Once the special tool is in place, turn the adjusting bolt (A) as necessary to make the jaws parallel. Then hand-tighten the pressure bolt (B), and recheck the jaws to make sure they are still parallel.



5. After making the adjustment to the adjusting bolt, make sure the head of the adjusting bolt is in this position (A) to allow the jaw (C) to pivot.

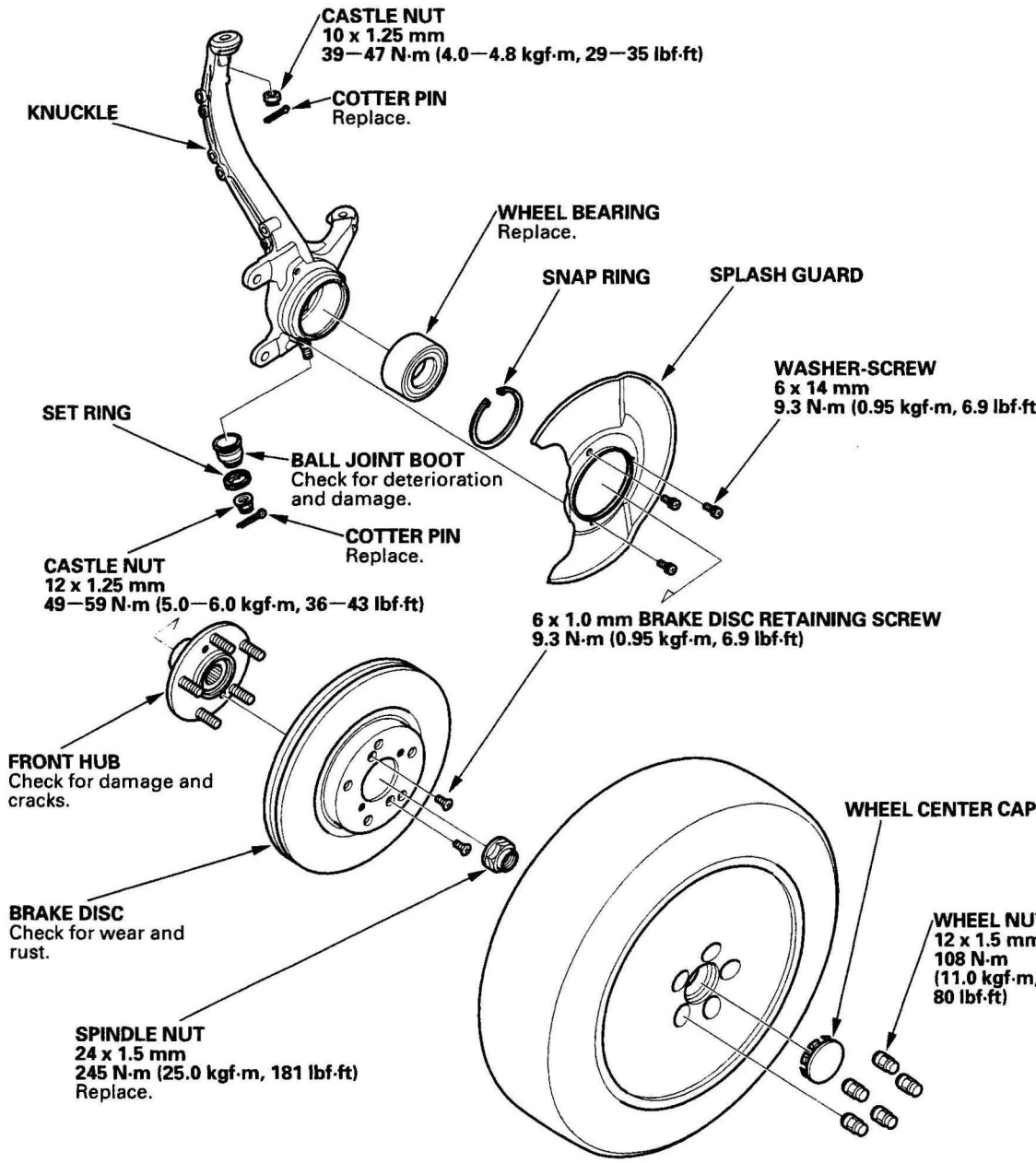
6. With a wrench, tighten the pressure bolt (B) until the ball joint shaft pops loose from the steering suspension arm. If necessary, apply penetrating type lubricant to loosen the ball joint.

7. Remove the tool, then remove the nut from the end of the ball joint and pull the ball joint out of the steering/suspension arm. Inspect the ball joint boot, and replace it if damaged.

Protected by AR

Knuckle/Hub Replacement

Exploded View

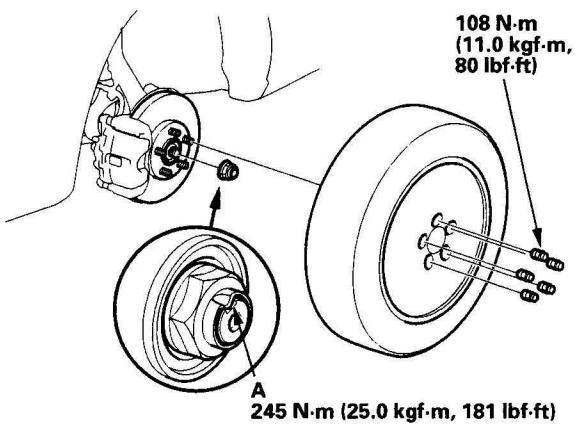


BACK

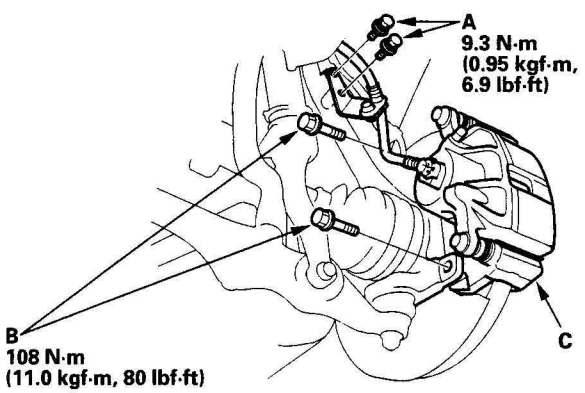
Protected by AR

Special Tools Required
- Ball joint remover, 28 mm 07MAC-SL00200
- Hub dis/assembly tool 07GAF-SE00100
- Attachment 58 x 72 mm 07947-6340201
- Bearing driver attachment 07965-SA00600
- Driver 07749-0010000
- Support base 07965-SD90100

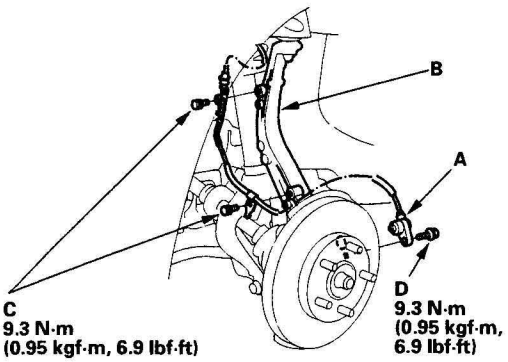
1. Loosen the wheel nuts slightly.
2. Raise the front of the vehicle, and make sure it is securely supported.
3. Remove the wheel nuts and front wheel.
4. Raise the locking tab on the spindle nut (A), then remove the nut.



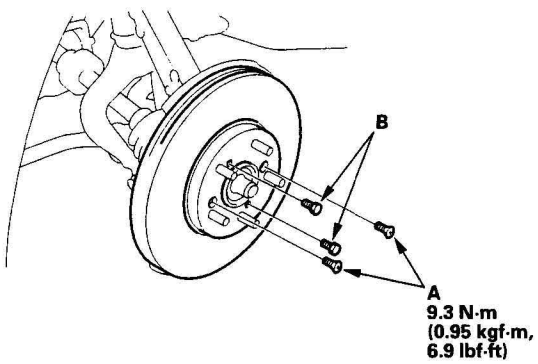
5. Remove the brake hose mounting bolts (A).



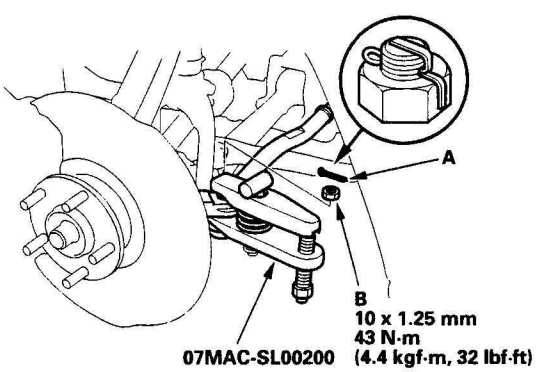
6. Remove the caliper mounting bolts (B), and hang the caliper assembly (C) to one side. To prevent damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper from the undercarriage.
7. Remove the wheel sensor (A) from the knuckle (B). Do not disconnect the wheel sensor connector.



8. Remove the 6 mm brake disc retaining screws (A).



9. Screw 2 8 x 1.25 mm bolts (B) into the disc to push it away from the hub. Turn each bolt 2 turns at a time to prevent cocking the disc excessively.
10. Remove the brake disc from the knuckle.
11. Check the front hub for damage and cracks.
12. Remove the cotter pin (A) from the tie-rod end ball joint, then loosen the nut (B).



(cont'd)

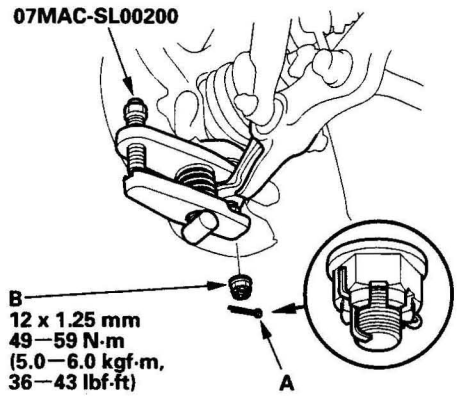
BACK

Protected by AR

Knuckle/Hub Replacement (cont'd)

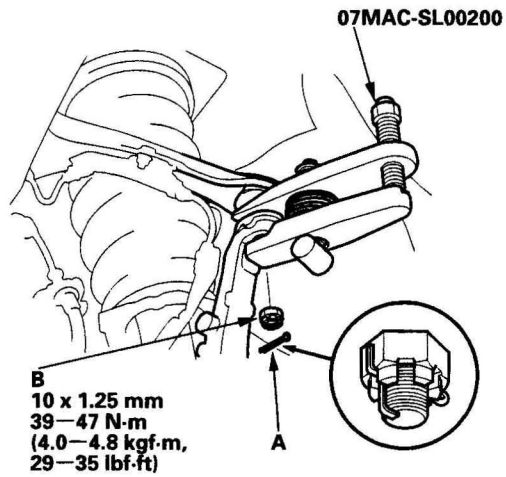
13. Remove the tie-rod ball joint from the knuckle using the special tool (see page 18-9).

14. Remove the cotter pin (A) from the lower arm ball joint castle nut (B), and remove the nut.



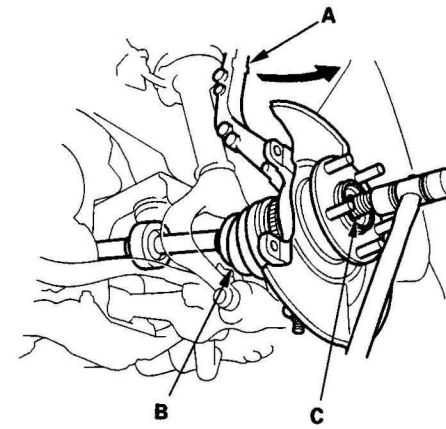
15. Remove the lower ball joint from the knuckle using the special tool (see page 18-9).

16. Remove the cotter pin (A) from the upper ball joint castle nut (B), and remove the nut.

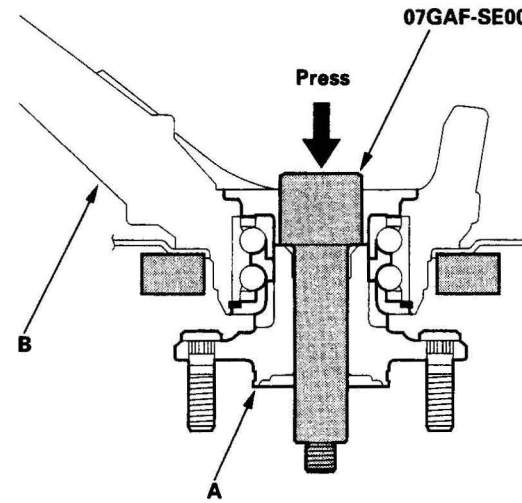


17. Remove the upper ball joint from the knuckle using the special tool (see page 18-9).

18. Pull the knuckle outward, and remove the driveshaft outboard joint (B) from the knuckle (A) by tapping the driveshaft end (C) with a plastic hammer, then remove the knuckle.



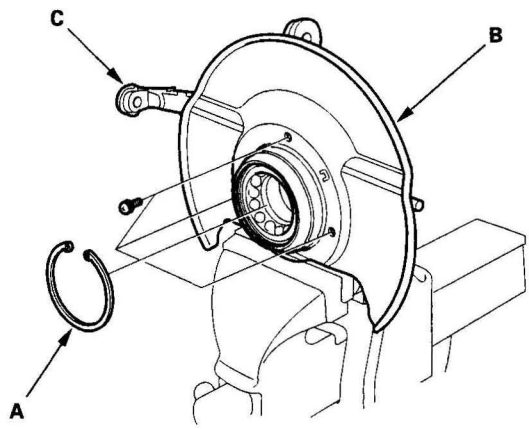
19. Separate the hub (A) from the knuckle (B) using the special tool and a hydraulic press. Take care not to distort the splash guard. Hold onto the hub to keep it from falling when pressed clear.



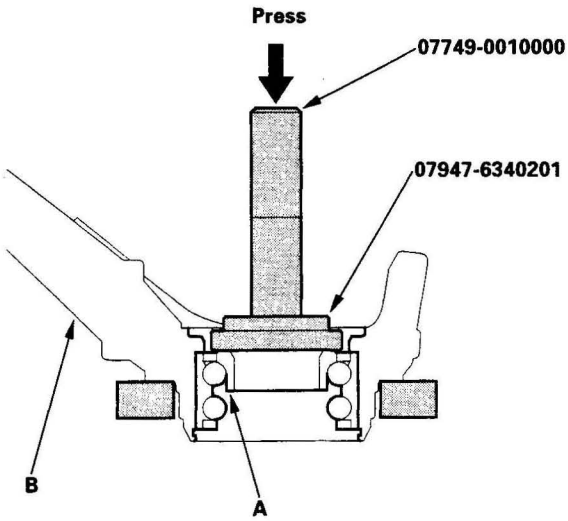
BACK

Protected by AR

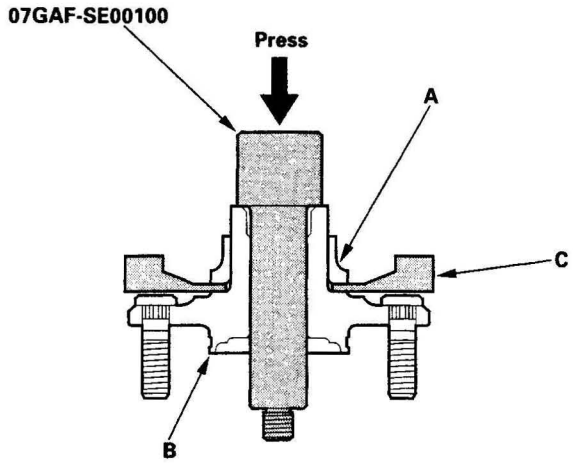
20. Remove the snap ring (A) and the splash guard (B) from the knuckle (C).



21. Press the wheel bearing (A) out of the knuckle (B) using the special tools and a press.

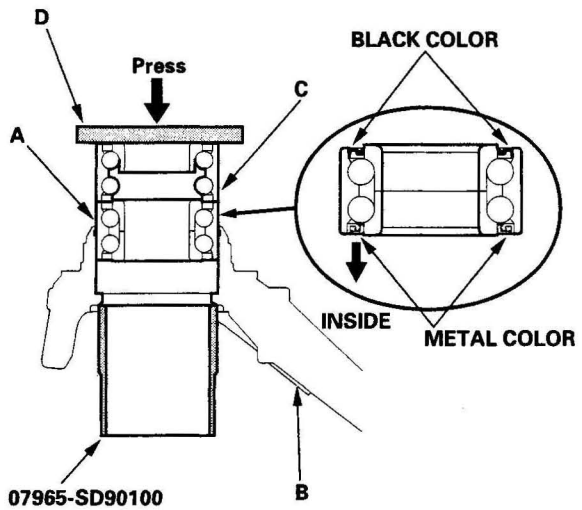


22. Press the wheel bearing inner race (A) from the hub (B) using the special tool, a commercially available bearing separator (C), and a press.



23. Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.

24. Press a new wheel bearing (A) into the knuckle (B) using the old bearing (C), a steel plate (D), the special tool, and a press. Place the wheel bearing on the knuckle with the pack seal side facing (metal color) toward the inside. Be careful not to damage the sleeve of the pack seal.



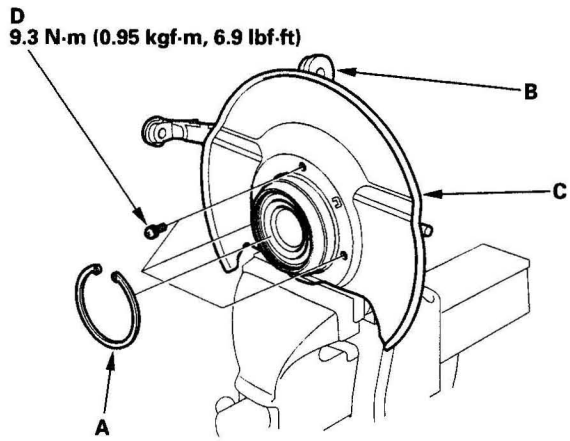
(cont'd)

BACK

Protected by AR

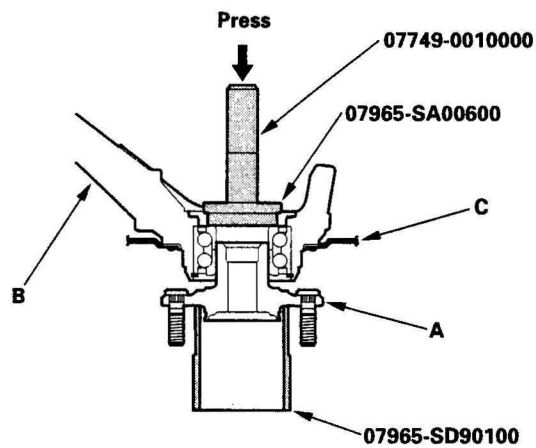
Knuckle/Hub Replacement (cont'd)

25. Install the snap ring (A) securely in the knuckle (B).



26. Install the splash guard (C), and tighten the screws (D).

27. Install the hub (A) on the knuckle (B) using the special tools shown and a hydraulic press. Be careful not to distort the splash guard (C).



28. Install the knuckle in the reverse order of removal, and pay particular attention to the following items:

- Be careful not to damage the ball joint boots when installing the knuckle.
- Torque all mounting hardware to the specified torque values.
- Torque the castle nuts to the lower torque specifications, then tighten them only far enough to align the slot with the pin hole. Do not align the castle nut by loosening.
- Install new cotter pins on the castle nuts after torquing.
- Raise the locking tab on the spindle nut (C), then remove the nut.
- Before installing the brake disc, clean the mating surface of the front hub and the inside of the brake disc.
- Before installing the spindle nut, apply a small amount of engine oil to the seating surface of the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.
- Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
- Check the front wheel alignment, and adjust it if necessary (see page 18-5).

BACK

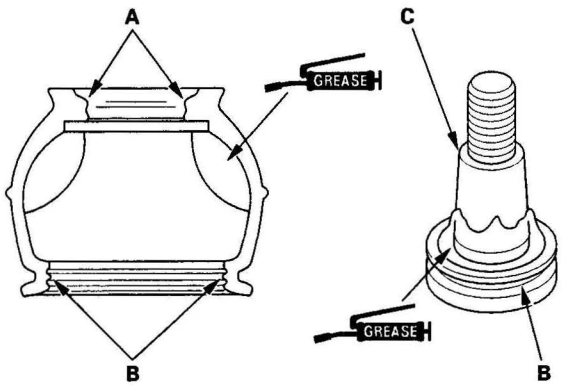
Protected by AR

Ball Joint Boot Replacement

Special Tools Required
Ball joint boot clip guide 07GAG-SD40700

1. Remove the boot clip and the boot.

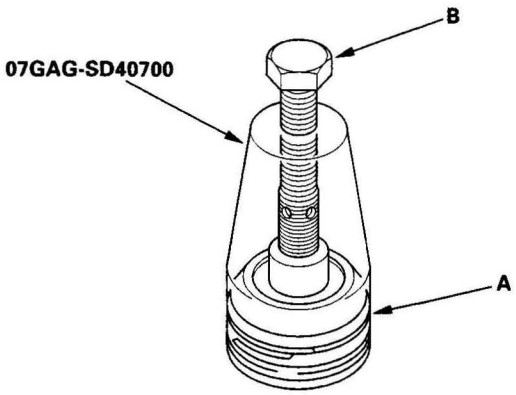
2. Pack the interior of the boot and lip (A) with grease. Do not contaminate the lower collar of the boot (B) with grease.



3. Wipe the grease off the tapered portion of the shaft and pack fresh grease into the base. Do not let dirt, or other foreign materials get into the boot.

4. Install the boot on the ball joint, then squeeze it gently to force out any air.

5. For a lower ball joint, adjust the special tool with the adjusting bolt (B) until its base is just above the groove around the bottom of the boot. Then slide the clip over the tool and into position on the boot.



6. For an upper ball joint, just hold the tool over the joint, then slide the clip over the tool and into position on the boot.

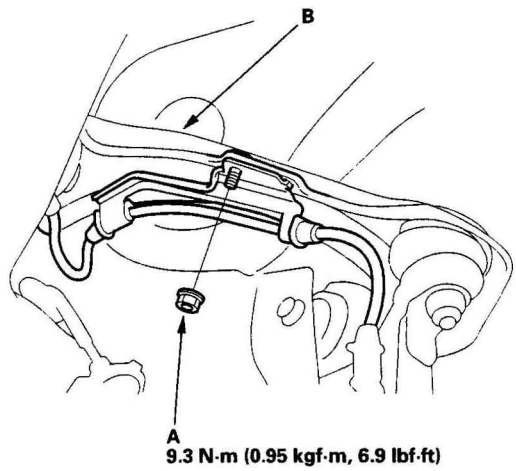
7. After installing a boot, wipe any grease off the exposed portion of the ball joint shaft.

Protected by AR

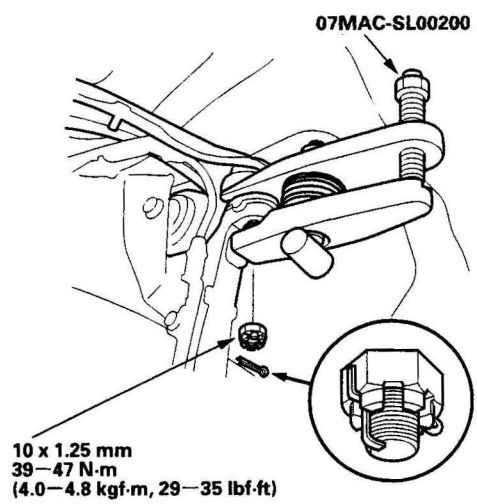
Upper Arm Replacement

Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

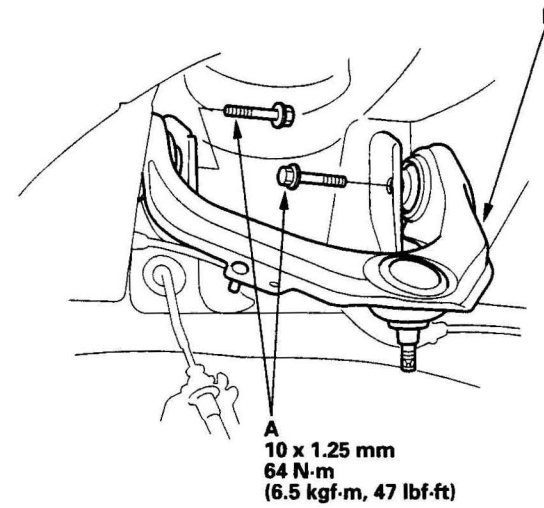
1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheel.
2. Remove the front damper (see step 1 on page 18-19).
3. Remove the wheel sensor bracket nut (A) from the upper arm (B).



4. Remove the cotter pin from the upper ball joint castle nut, and remove the nut.



5. Remove the upper ball joint from the knuckle using the special tool (see page 18-9).
6. Remove the flange bolts (A) from the upper arm (B).



7. Install the upper arm in the reverse order of removal, and note these items:
   - Be careful not to damage the ball joint boot when connecting the upper arm to the knuckle.
   - Tighten all mounting hardware to the specified torque values.Tighten the castle nut to the lower torque value, then tighten it only far enough to align the slot with the hole in the stud. Do not align the castle nut by loosening it.
   - Use a new cotter pin on the castle nut.
   - Before installing the wheel, clean the mating surface on the brake disc and the inside of the wheel.
   - Check the front wheel alignment, and adjust it if necessary (see page 18-5).

BACK

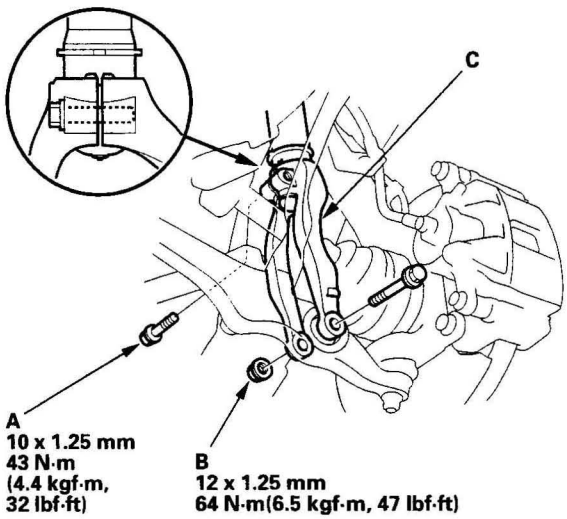
Protected by AR

Lower Arm Replacement

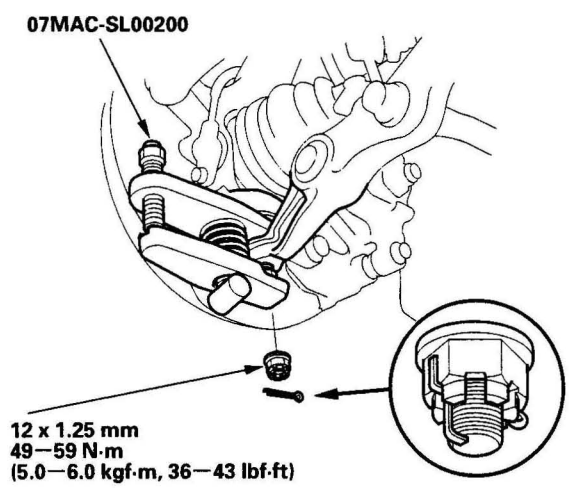
1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheel.

2. Remove the damper fork.

   –1 Remove the damper pinch bolt (A).
   –2 Remove the lower bolt and self-locking nut (B) from the damper fork.
   –3 Remove the damper fork (C) from the damper.



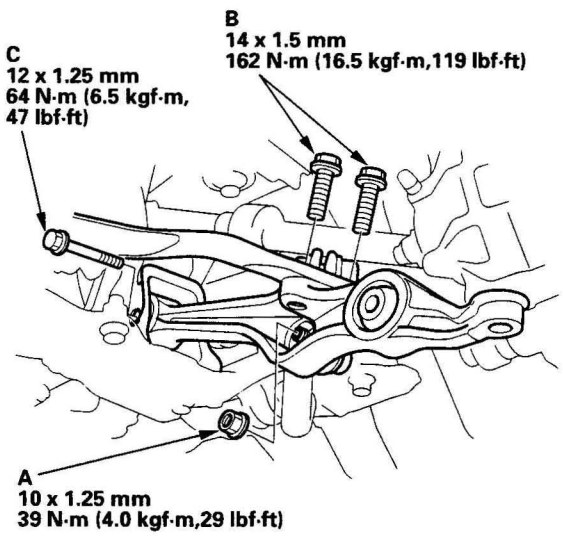
3. Remove the cotter pin from the lower ball joint castle nut, and remove the nut.



4. Remove the lower ball joint from the knuckle using the special tool (see page 18-9).

5. Remove the lower arm.

   –1 Remove the self-locking nut from the stabilizer link (A).
   –2 Remove the radius rod bolts (B).
   –3 Remove the lower arm mounting bolt (C).
   –4 Remove the lower arm (D) from the rear beam.



6. Install the lower arm in the reverse order of removal, and note these items:

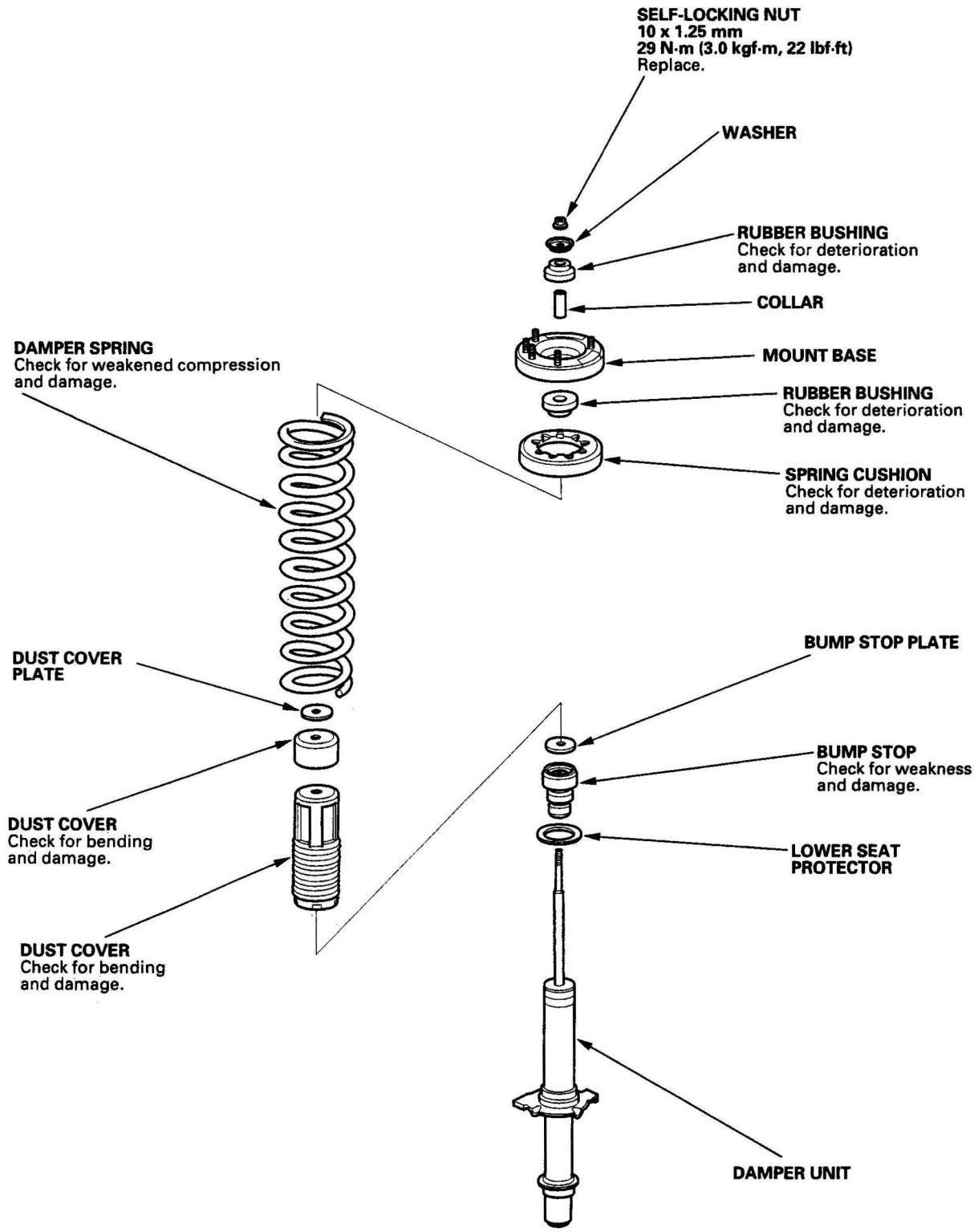
   - Be careful not to damage the ball joint boot when connecting the lower arm to the knuckle.
   - Tighten all mounting hardware to the specified torque values.
   - Tighten the castle nut to the lower torque value, then tighten it only far enough to align the slot with the hole in the stud. Do not align the castle nut by loosening it.
   - Use a new cotter pin on the castle nut.
   - Before installing the wheel, clean the mating surfaces on the brake disc and the inside of the wheel.
   - Check the front wheel alignment, and adjust it if necessary (see page 18-5).

BACK

Protected by AR

Damper/Spring Replacement

Exploded View



BACK

Protected by AR

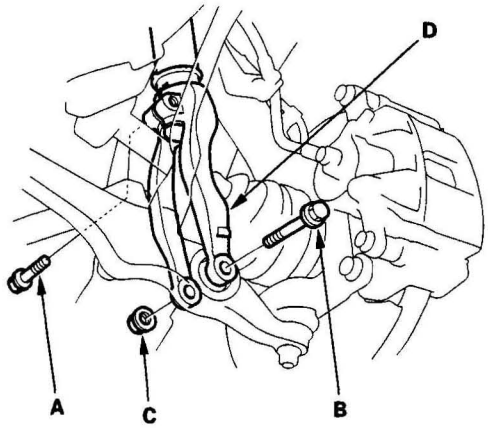
Special Tools Required
Strut spring compressor Branick MST-580A or Model 7200 or equivalent, commercially available

Removal

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheel.

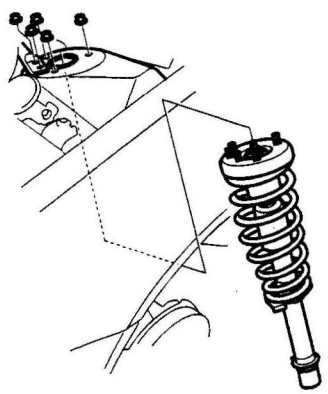
2. Remove the damper fork.

   -1 Remove the damper pinch bolt (A).
   -2 Remove the lower bolt (B) and self-locking nut (C) from the damper fork.
   -3 Remove the damper fork (D) from the damper.



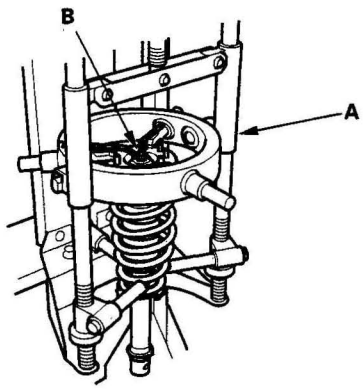
3. Remove the damper by removing the 5 flange nuts.

   NOTE: Damper springs are different, left and right. Mark the springs L and R before you continue.



Disassembly/Inspection

1. Compress the damper spring with a commercially available strut spring compressor (A) according to the manufacturer's instructions, then remove the self-locking nut (B). Do not compress the spring more than necessary to remove the nut.



2. Release the pressure from the strut spring compressor, then disassemble the damper as shown in the Exploded View.

3. Reassemble all parts, except the spring.

4. Compress the damper assembly by hand, and check for smooth operation through a full stroke, both compression and extension. The damper should move smoothly. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.

5. Check for oil leaks, abnormal noises, or binding during these tests.

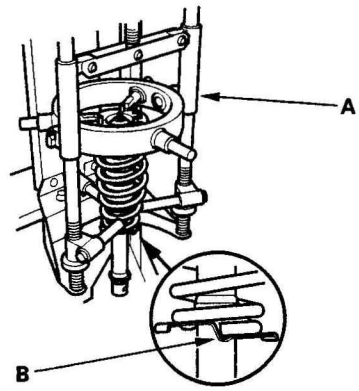
(cont'd)

Protected by AR

Damper/Spring Replacement (cont'd)

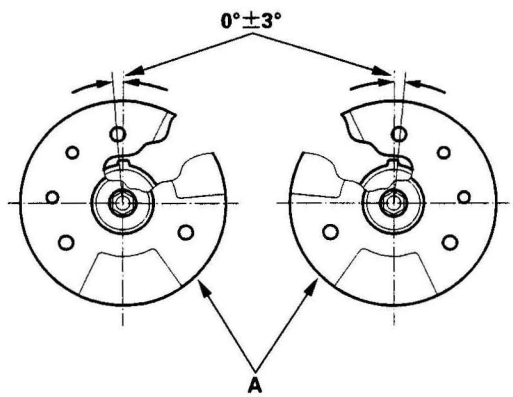
Reassembly

1. Install the damper unit on a commercially available strut spring compressor (A).



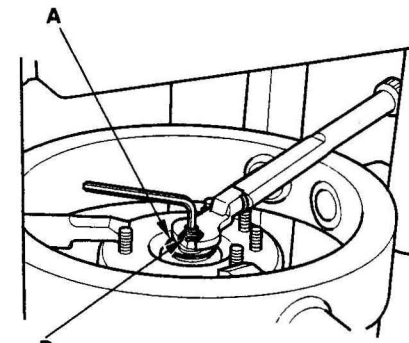
2. Assemble the damper in the reverse order of removal except for the washer and self-locking nut. Align the bottom of the damper spring and the spring lower seat (B).

3. Position the mount base (A) on the damper unit.



4. Compress the damper spring with the spring compressor.

5. Install the rubber bushing, washer (A), and a new 10 mm self-locking nut (B).



10 x 1.25 mm
29 N·m (3.0 kgf·m, 22 lbf·ft)

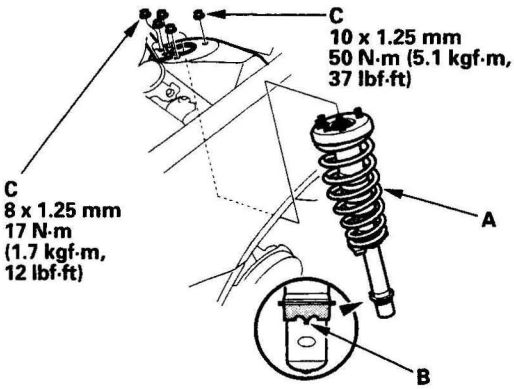
6. Hold the damper shaft, and tighten the 10 mm self-locking nut.

BACK

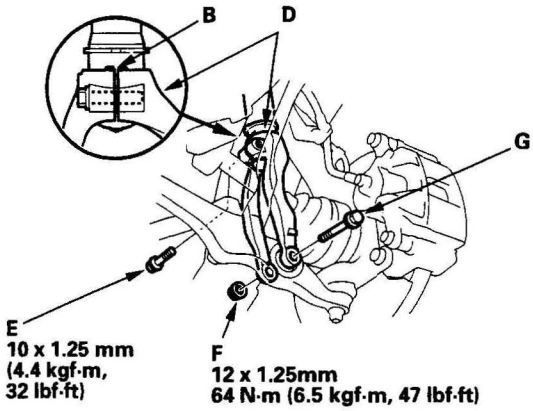
Protected by AR

Installation

1. Loosely install the damper (A) on the frame with the aligning tab (B) facing inside, then loosely install the five flange nuts (C).



2. Install the damper fork (D) over the driveshaft and onto the lower arm. Install the front damper in the damper fork so the aligning tab (B) is aligned with the slot in the damper fork.



3. Loosely install the damper pinch bolt (E) into the damper fork.

4. Loosely install a new self-locking nut (F) with the flange bolt (G).

5. Raise the knuckle with a floor jack until the vehicle just lifts off the safety stand.

6. Tighten the damper pinch bolt.

7. Tighten the flange bolt and the self-locking nut.

8. Tighten the flange nuts on the top of the damper to the specified torque.

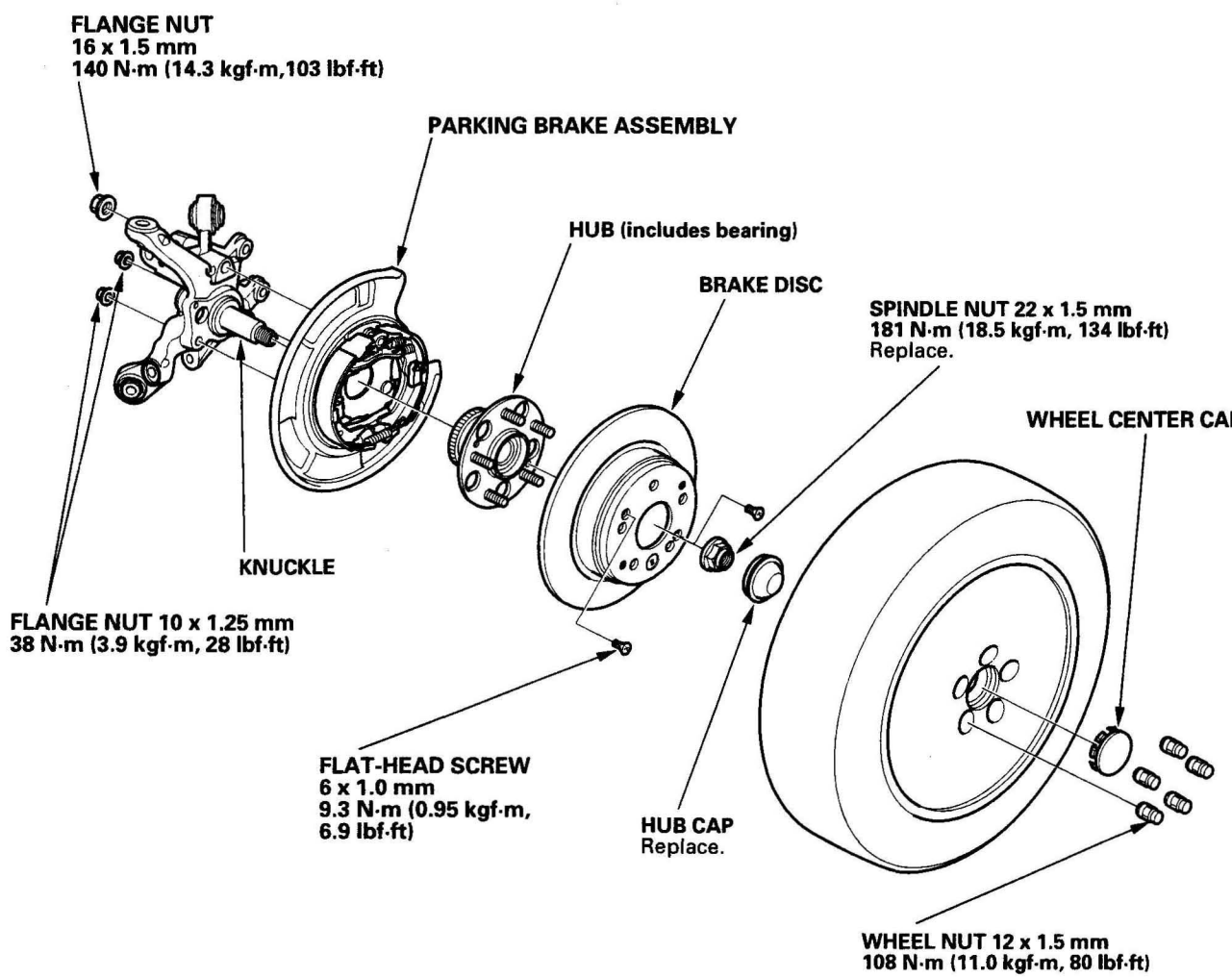
9. Install the front wheel.

BACK

Protected by AR

Hub/Bearing Replacement

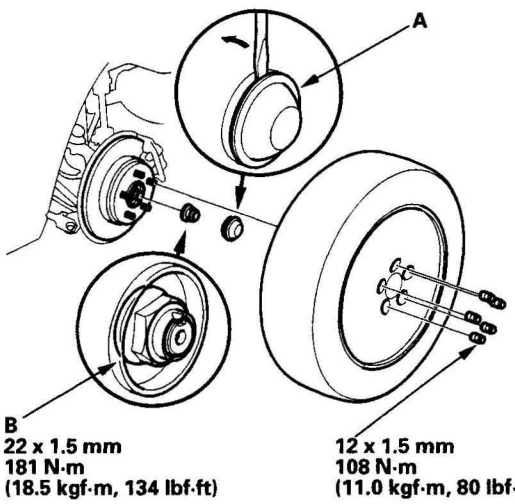
Exploded View



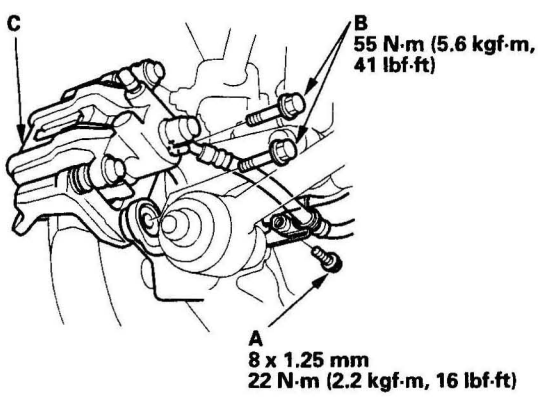
BACK

Protected by AR

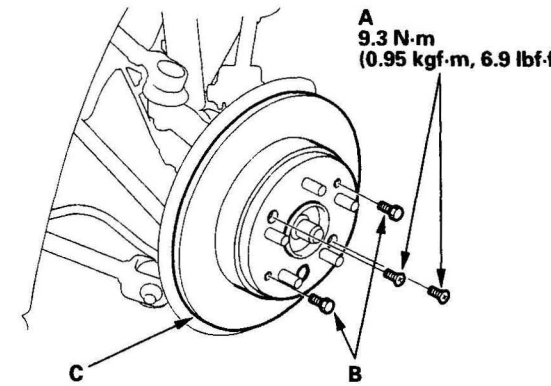
1. Raise the rear of the vehicle, and make sure it is securely supported.
2. Remove the wheel nuts and rear wheel.
3. Press down on the parking brake pedal.
4. Remove the hub cap (A).



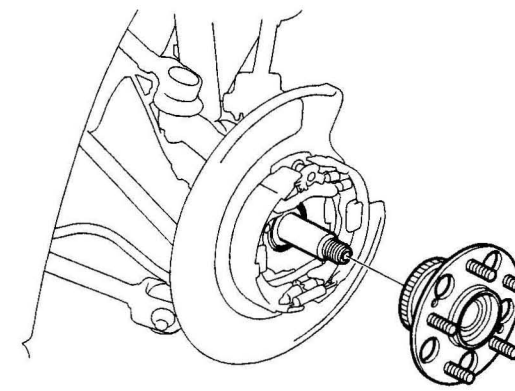
5. Raise the locking tab on the spindle nut (B), then remove the nut.
6. Release the parking brake pedal.
7. Remove the brake hose mounting bolt (A).



8. Remove the caliper bracket mounting bolts (B), and hang the caliper (C) to one side. To prevent damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.
9. Remove the 6 mm brake disc retaining screws (A).



10. Screw two 8 x 1.25 mm bolts (B) into the disc (C) to push it away from the hub. Turn each bolt two turns at a time to prevent cocking the disc excessively.
11. Remove the hub bearing unit from the knuckle.



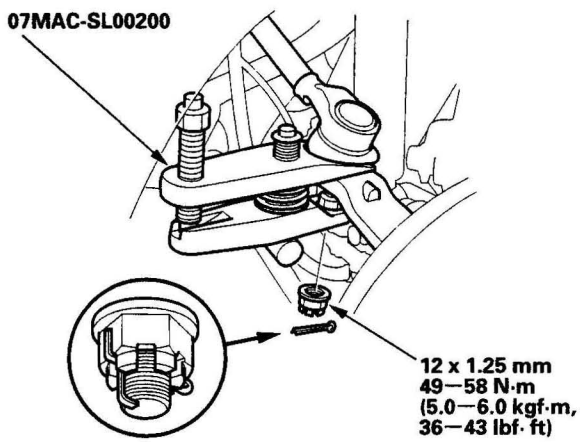
12. Install the bearing in the reverse order of removal, and pay particular attention to the following items:
    - Before installing the brake disc, clean the mating surfaces of the rear hub and brake disc.
    - Wash the bearing and spindle thoroughly in high flash point solvent before reassembly.
    - To prevent damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.
    - After tightening, use a drift to stake the spindle nut shoulder against the spindle.

Protected by AR

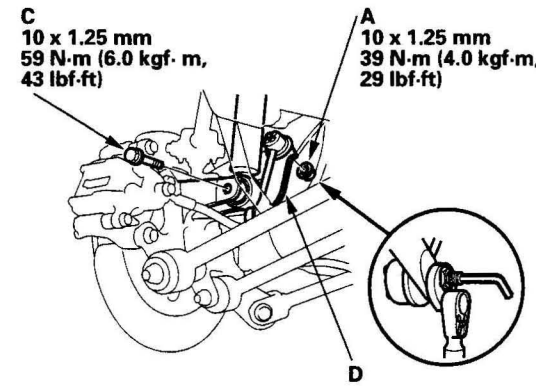
Knuckle Replacement

Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

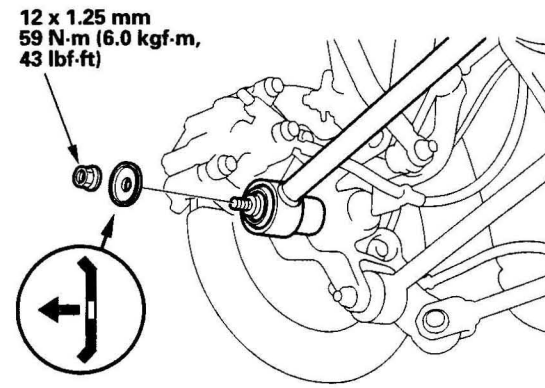
1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheel.
2. Remove the rear brake caliper, the caliper mounting bracket, and the brake hose mounting bolt from the rear knuckle (see step 7 on page 18-23).
3. Remove the rear brake disc and hub (see step 8 on page 18-23).
4. Remove the cotter pin from the upper ball joint castle nut, and remove the nut.



5. Separate the upper ball joint from the knuckle using the special tool (see page 18-9).
6. Remove the ABS sensor from the brake backing plate (see page 19-106).
7. Remove the flange nut (A) from the stabilizer link while holding the stabilizer link joint pin with a hex wrench (B).



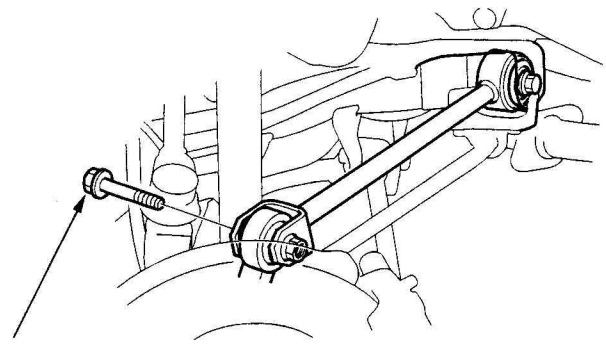
8. Remove the damper lower mount bolt (C), and the stabilizer link mounting bracket (D).
9. Remove the control arm mounting nut from the rear knuckle.



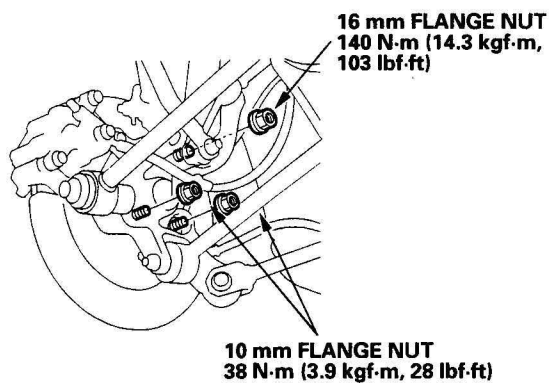
BACK

Protected by AR

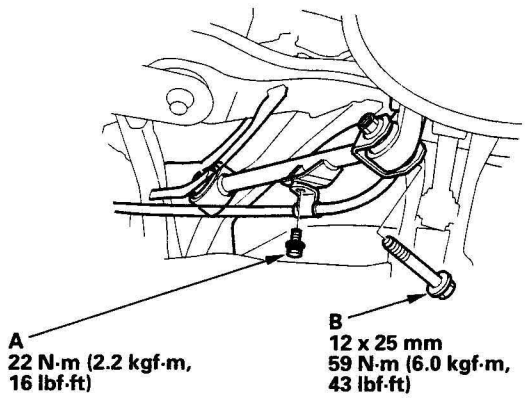
10. Remove the leading arm mounting bolt from the rear knuckle.



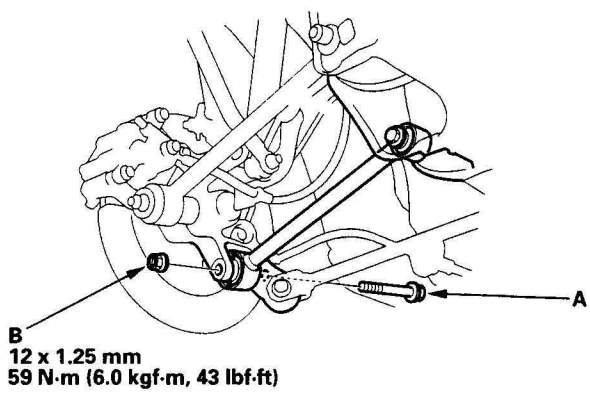
11. Remove the backing plate mounting nuts, then remove the backing plate.



12. Remove the parking brake cable mounting bolt (A) from the trailing arm, then remove the trailing arm mounting bolt (B) from the rear knuckle.



13. Remove the lower arm mounting bolt (A) and nut (B), then remove the knuckle.



14. Reinstall the knuckle in the reverse order of removal, and note these items:

- Be careful not to damage the boot joint boot when connecting the upper arm to the knuckle.
- Tighten all mounting hardware to the specified torque values.
- Tighten the castle nut to the lower torque specifications, then tighten it only far enough to align the slot with the hole in the stud. Do not align the castle nut by loosening it.
- Use a new cotter pin in the castle nut.
- Before installing the wheel, clean the mating surfaces on the brake disc and inside of the wheel.
- Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

BACK

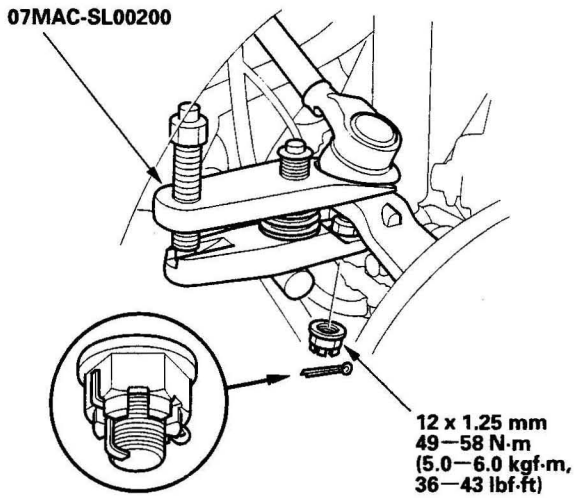
Protected by AR

Upper Arm Replacement

Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

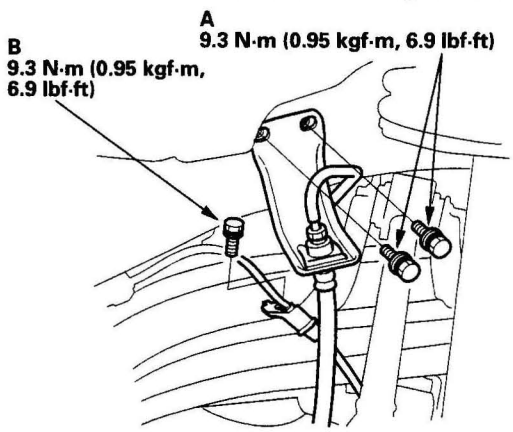
1. Remove the cotter pin from the upper ball joint castle nut, and remove the nut.

2. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheel.



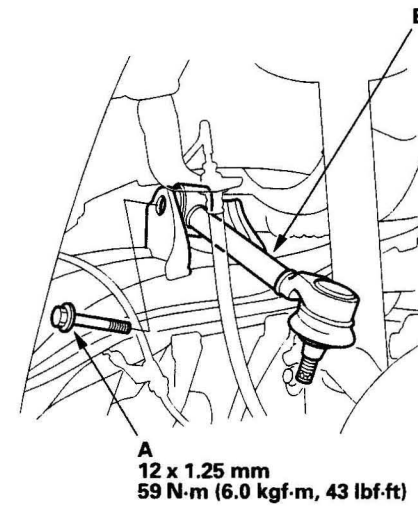
3. Remove the upper ball joint from the knuckle using the special tool (see page 18-9).

4. Remove the brake hose mounting bolts (A).



5. Remove the wheel sensor mounting bolt (B).

6. Remove the upper arm bolt (A). Remove the upper arm (B) from the vehicle.



7. Install the upper arm in the reverse order of removal, and note these items:

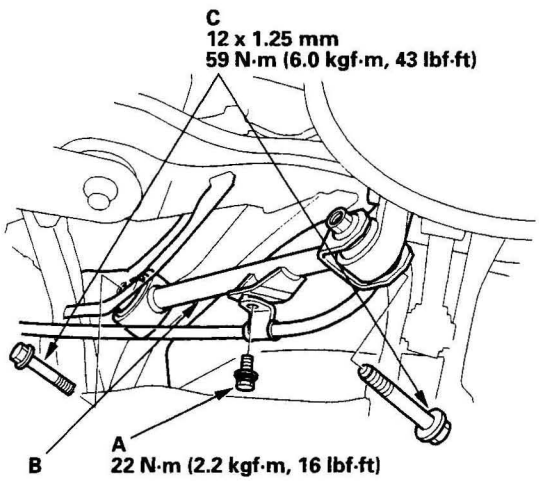
- Be careful not to damage the ball joint boot when connecting the upper arm to the knuckle.
- Tighten all mounting hardware to the specified torque values.
- Tighten the castle nut to the lower torque specifications, then tighten it only far enough to align the slot with the hole in the stud. Do not align the castle nut by loosening it.
- Use a new cotter pin in the castle nut.
- Before installing the wheel, clean the mating surfaces on the brake disc and the inside of the wheel.
- Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

BACK

Protected by AR

Trailing Arm Replacement

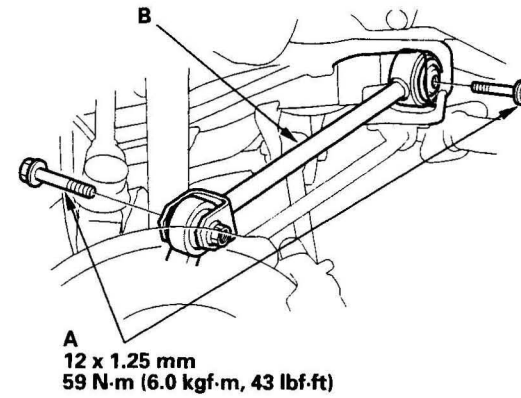
1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheel.
2. Remove the parking cable mounting bolt (A) from the trailing arm (B).
3. Remove the trailing arm mounting bolts (C).
4. Remove the trailing arm (B) from the vehicle.



5. Install the trailing arm in the reverse order of removal, and note these items:
   - Tighten all mounting hardware to the specified torque values.
   - Before installing the wheel, clean the mating surfaces on the brake disc and the inside of the wheel.
   - Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

Leading Arm Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheel.
2. Remove the leading arm mounting bolts (A), and remove the leading arm (B) from the vehicle.



3. Install the leading arm in the reverse order of removal, and note these items:
   - Tighten all mounting hardware to the specified torque values.
   - Before installing the wheel, clean the mating surfaces on the brake disc and the inside of the wheel.
   - Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

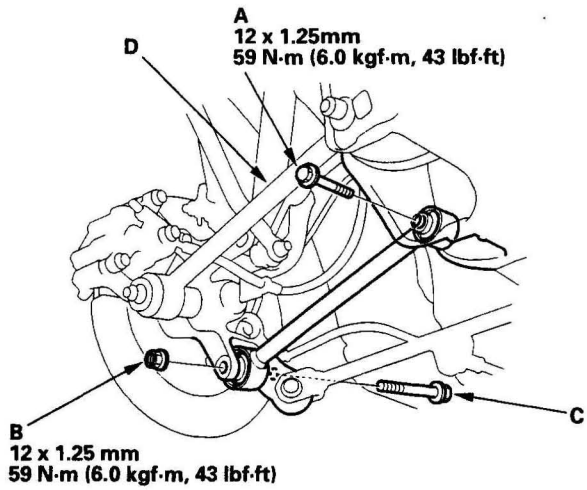
BACK

Protected by AR

Lower Arm Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheel.

2. Remove the leading arm mounting bolts (A), and remove the leading arm (B) from the vehicle.



3. Install the leading arm in the reverse order of removal, and note these items:

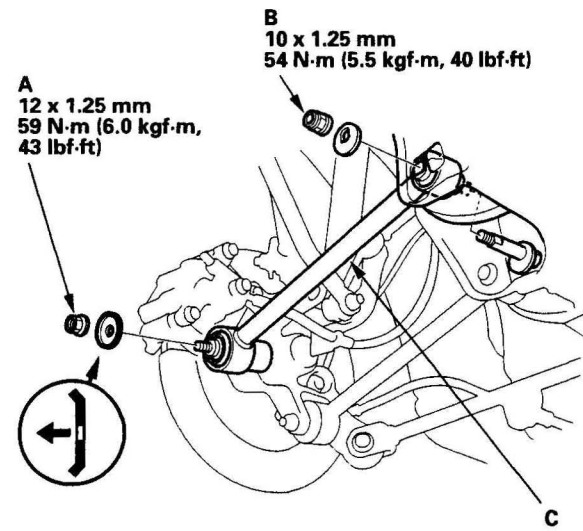
   - Tighten all mounting hardware to the specified torque values.
   - Before installing the wheel, clean the mating surfaces on the brake disc and the inside of the wheel.
   - Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

Control Arm Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheel.

2. Remove the control arm from the vehicle.

   –1 Remove the self-locking nut (A) from the knuckle bolt.
   –2 Remove the self-locking nut (B) from the rear suspension subframe.
   –3 Remove the control arm (C) from the vehicle.



3. Install the control arm in the reverse order of removal, and note these items:

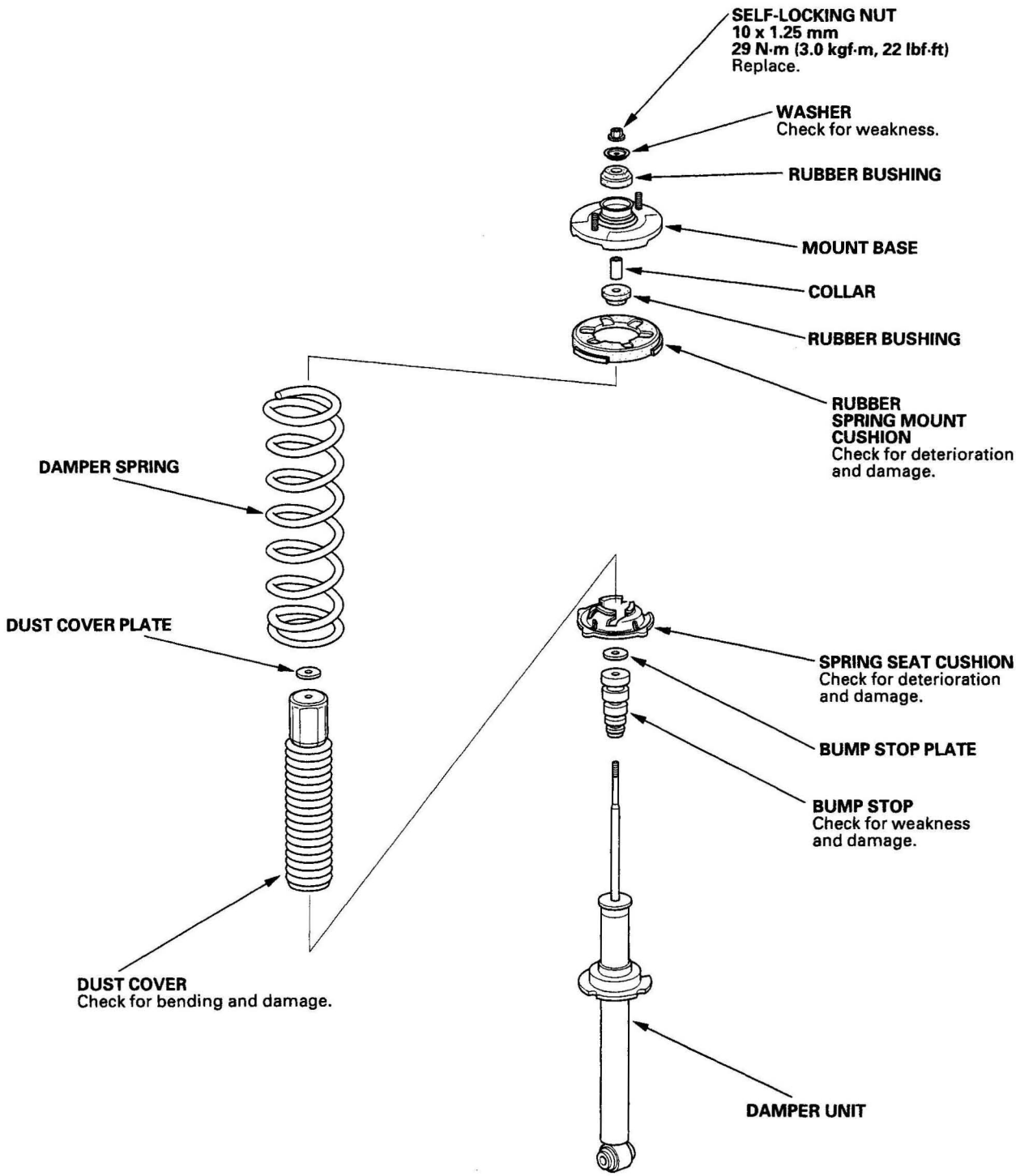
   - Tighten all mounting hardware to the specified torque values.
   - Before installing the wheel, clean the mating surfaces on the brake disc and the inside of the wheel.
   - Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

BACK

Protected by AR

Damper/Spring Replacement

Exploded View



(cont'd)

BACK

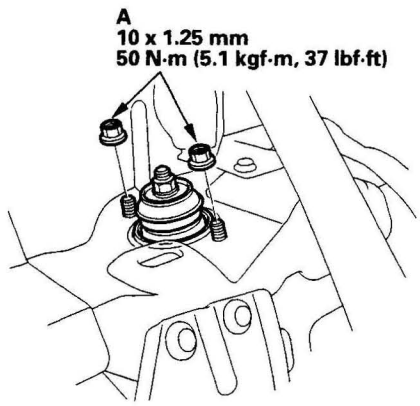
Protected by AR

Damper/Spring Replacement (cont'd)

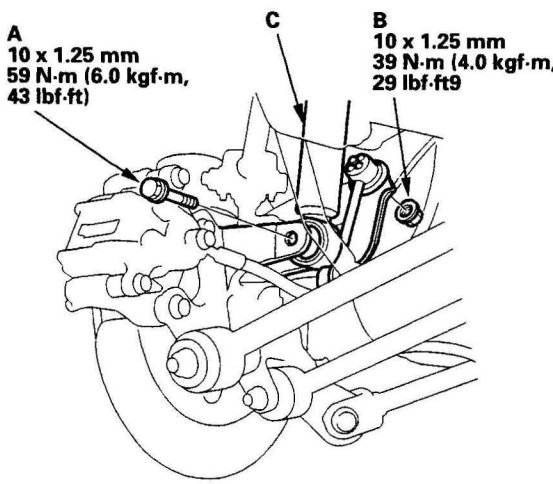
Special Tools Required
Strut spring compressor, Branick MST-580A or Model 7200 or equivalent, Commercially Available

Removal

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheel.
2. Remove the rear shelf (see page 20-56).
3. Remove the two flange nuts (A).



4. Remove the flange bolt (A) from the knuckle.

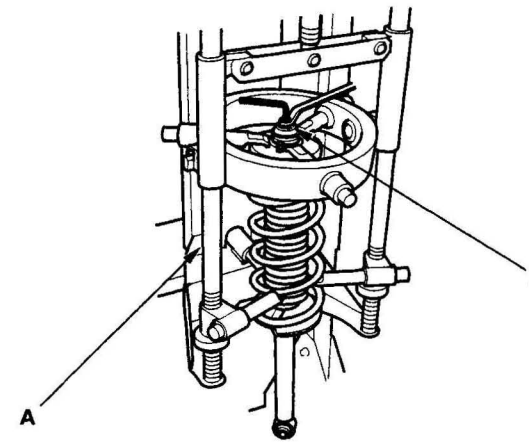


5. Remove the flange nut (B) from the stabilizer link.
6. Lower the rear suspension, and remove the damper (C) from the vehicle.

   NOTE: Damper springs are different, left and right. Mark the springs L and R before you continue.

Disassembly/Inspection

1. Compress the damper spring with the commercially available strut spring compressor (A) according to the manufacturer's instructions, then remove the self-locking nut (B). Do not compress the spring more than necessary to remove the self-locking nut.



2. Release the pressure from the strut spring compressor, then disassemble the damper as shown in the Exploded View.
3. Reassemble all parts, except the spring.
4. Compress the damper by hand, and check for smooth operation through a full stroke, both compression and extension. The damper should move smoothly. If it does not, replace it.
5. Check for oil leaks, abnormal noises, and binding during these tests.

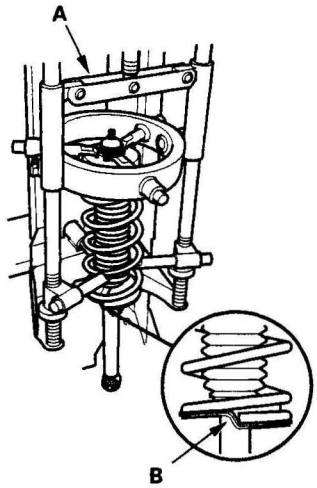
BACK

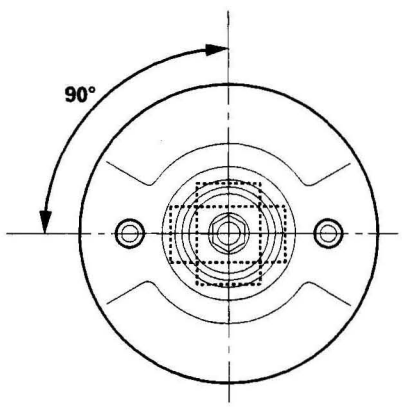
Protected by AR

Reassembly

1. Install the damper unit on a commercially available strut spring compressor (A).

2. Assemble the damper in reverse order of disassembly, except for the washer and self-locking nut. Align the bottom of the damper spring and the spring lower seat (B).

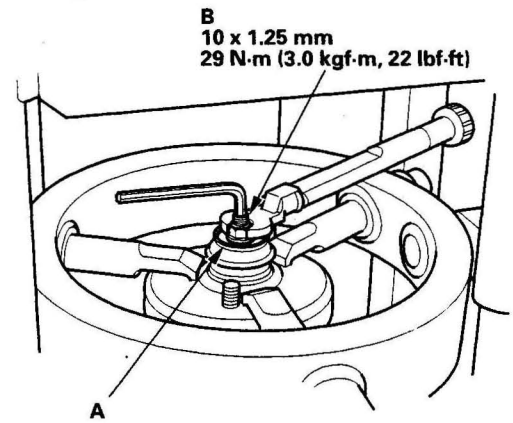




3. Position the damper mounting base on the damper unit.

4. Compress the damper spring with the spring compressor.

5. Install the washer (A), and loosely install a new self-locking nut (B).



6. Hold the damper shaft with a hex wrench, and tighten the self-locking nut.

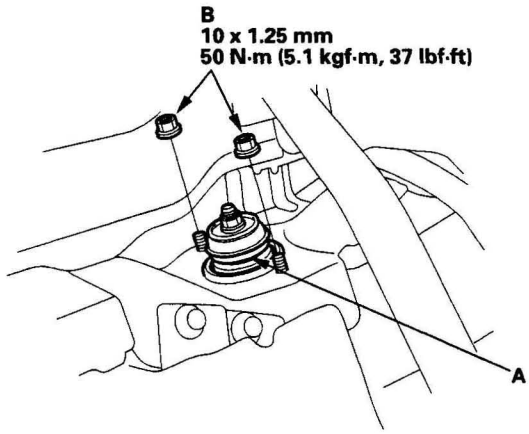
(cont'd)

Protected by AR

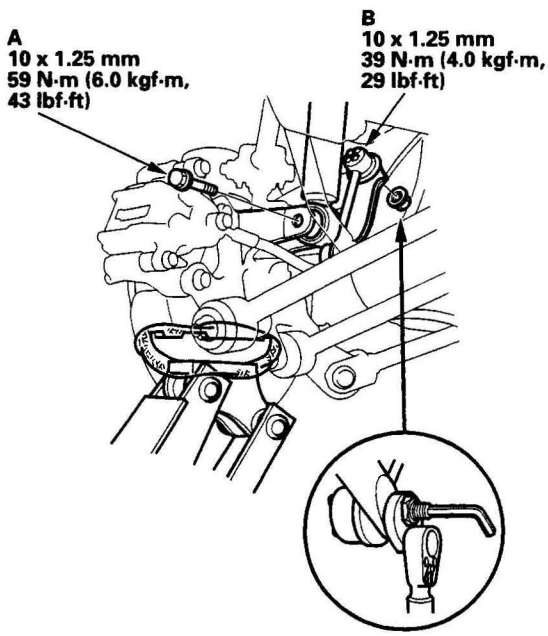
Damper/Spring Replacement (cont'd)

Installation

1. Lower the rear suspension, and position the damper (A), and loosely install the two flange nuts (B).



2. Loosely install the flange bolt (A) and nut (B).



3. Raise the rear suspension with a floor jack until the vehicle just lifts off the safety stand.
4. Tighten the flange bolt at the bottom of the damper to the specified torque.
5. Tighten the flange nut of the stabilizer link ball joint to the specified torque while holding the joint pin with a hex wrench.
6. Tighten the two flange nuts on top of the damper to the specified torque.
7. Install the rear shelf (see page 20-56).
8. Install the rear wheels.
9. Check the rear wheel alignment and adjust it if necessary (see page 18-5).

BACK

Protected by AR

Brakes

Conventional Brake Components

Special Tools 19-2
Component Location Index 19-3
Brake System Operation and Leakage Check 19-4
Brake Pedal and Brake Pedal Position Switch Adjustment 19-5
Parking Brake Check and Adjustment 19-6
Brake System Bleeding 19-8
Brake System Indicator Circuit Diagram 19-9
Parking Brake Switch Test 19-10
Brake Fluid Level Switch Test 19-10
Front Brake Pads Inspection/ Replacement 19-11
Front Brake Disc Inspection 19-13
Front Brake Caliper Overhaul 19-14
Master Cylinder Replacement 19-15
Master Cylinder Inspection 19-16
Master Cylinder Pushrod Clearance Adjustment 19-16
Brake Booster Test 19-18
Brake Booster Replacement 19-19
Rear Brake Pads Inspection/ Replacement 19-20
Rear Brake Disc Inspection 19-22
Rear Brake Caliper Overhaul 19-23
Parking Brake Inspection 19-24
Parking Brake Shoes Replacement 19-26
Lining Surface Break-in 19-29
Brake Hoses and Lines Inspection 19-30
Brake Hose Replacement 19-31
Parking Brake Cable Replacement 19-32

ABS/TCS (Anti-Lock Brake System/Traction Control System) Components 19-35

VSA (Vehicle Stability Assist) System Components 19-107

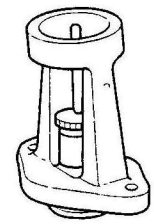


Protected by AR

Conventional Brake Components

Special Tools

Ref.No.	Tool Number	Description	Qty
①	07JAG-SD40100	Pushrod Adjustment Gauge	1

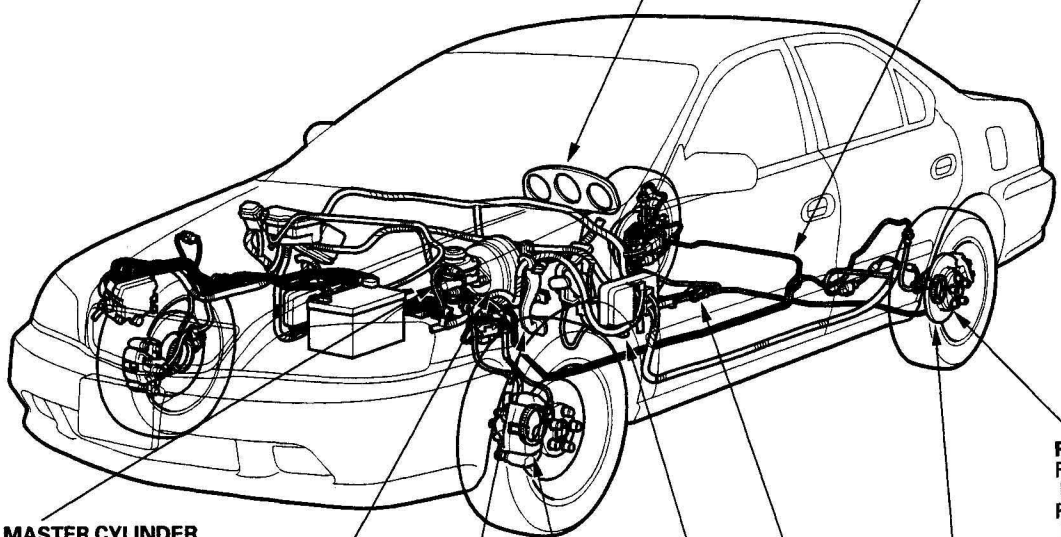


①

BACK

Protected by AR

Component Location Index



INDICATOR
Brake System Indicator Circuit Diagram, page 19-9
Parking Brake Switch Test, page 19-10
Brake Fluid Level Switch Test, page 19-10

BRAKE HOSES/LINES
Brake Hoses and Lines Inspection, page 19-30
Brake Hose Replacement, page 19-31

PARKING DRUM BRAKE
Parking Brake Inspection, page 19-24
Parking Brake Shoes Replacement, page 19-26
Lining Surface Break-in, page 19-29

REAR DISC BRAKE
Rear Brake Pads Inspetion/ Replacement, page 19-20
Rear Brake Disc Inspection, page 19-22
Rear Brake Caliper Overhaul, page 19-23

PARKING BRAKE CABLE
Parking Brake Cable Replacement, page 19-32

PARKING BRAKE PEDAL
Parking Brake Check and Adjustment, page 19-6

FRONT BRAKES
Front Brake Pads Inspection/ Replacement, page 19-11
Front Brake Disc Inspection, page 19-13
Front Brake Caliper Overhaul, page 19-14

BRAKE PEDAL
Brake Pedal Adjustment, page 19-5

BRAKE BOOSTER
Brake Booster Test, page 19-18
Brake Booster Replacement, page 19-19

MASTER CYLINDER
Brake System Bleeding, page 19-8
Master Cylinder Replacement, page 19-15
Master Cylinder Inspection, page 19-16
Master Cylinder pushrod Clearance Adjustment, page 19-16

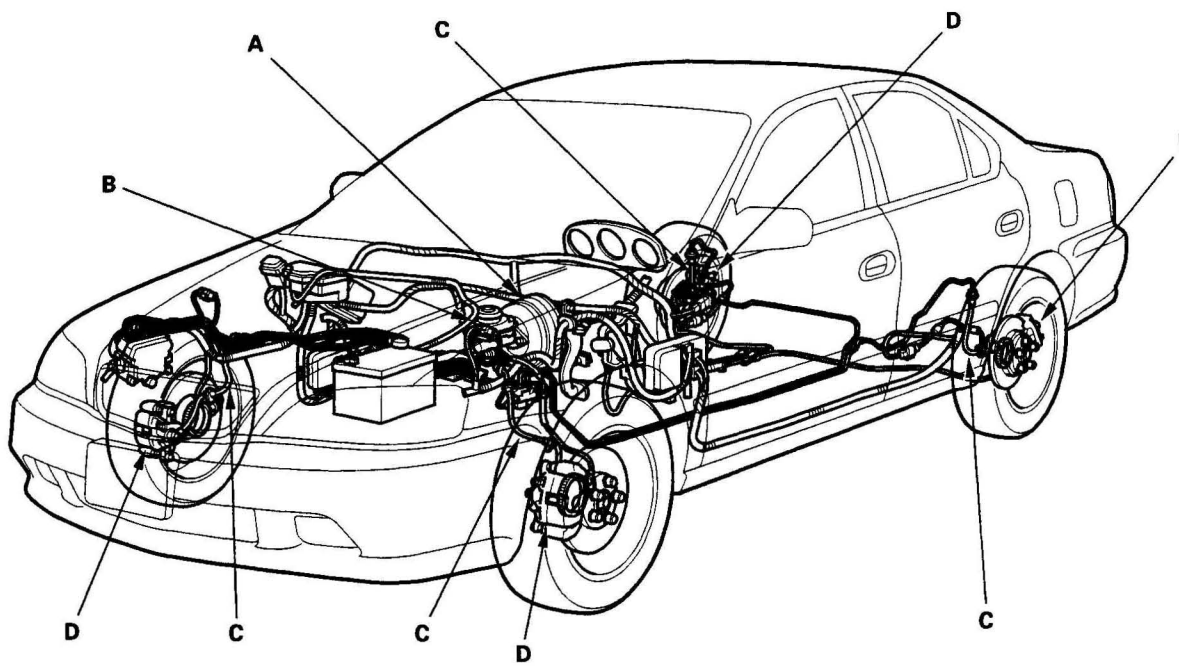
BACK

Protected by AR

Brake System Operation and Leakage Check

Check all of the following items:

Component	Procedure
Brake Booster (A)	Check brake operation by applying the brakes during a test drive. If the brakes do not work properly, check the brake booster. Replace the brake booster as an assembly if it does not work properly or if there are signs of leakage.
Piston Cup and Pressure Cup Inspection (B)	• Check brake operation by applying the brakes. Look for damage or signs of fluid leakage. Replace the master cylinder as an assembly if the pedal does not work properly or if there is damage or signs of fluid leakage. • Check for a difference in brake pedal stroke between quick and slow brake applications. Replace the master cylinder if there is a difference in pedal stroke.
Brake Hoses (C)	Look for damage or signs of fluid leakage. Replace the brake hose with a new one if it is damaged or leaking.
Caliper Piston Seal and Piston Boots (D)	Check brake operation by applying the brakes. Look for damage or signs of fluid leakage. If the pedal does not work properly, the brakes drag, or there is damage or signs of fluid leakage, disassemble and inspect the brake caliper. Replace the boots and seals with new ones whenever the brake caliper is disassembled.



BACK

Protected by AR

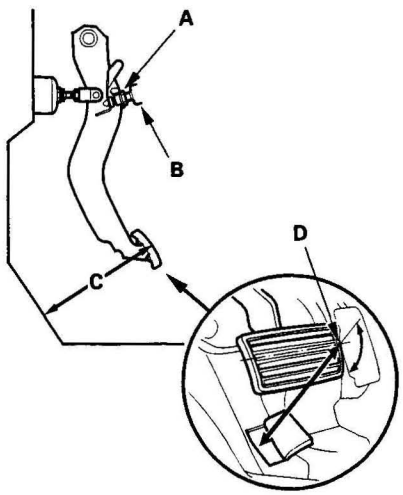
Brake Pedal and Brake Pedal Position Switch Adjustment

Pedal Height

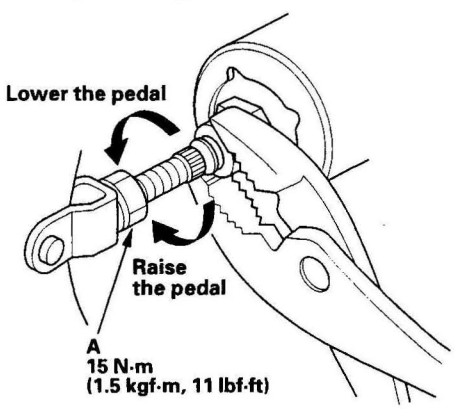
1. Disconnect the brake pedal position switch (brake switch) connector, loosen the brake pedal position switch locknut (A), and back off the brake pedal position switch (B) until it is no longer touching the brake pedal.

2. Pull back the carpet. At the insulator cutout, measure the pedal height (C) from the middle of the right side of the pedal pad (D).

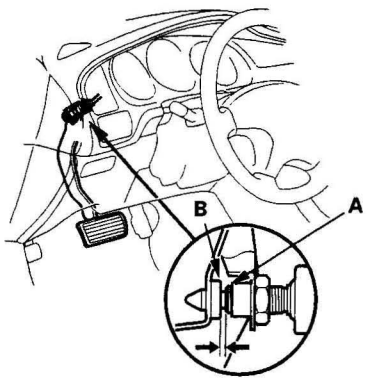
   Standard Pedal Height (with carpet removed): 169 mm (6 10/16 in.)



3. Loosen the pushrod locknut (A), and screw the pushrod in or out with pliers until the standard pedal height from the floor is reached. After adjustment, tighten the locknut firmly. Do not adjust the pedal height with the pushrod pushed in.



4. Screw in the brake pedal position switch until its plunger is fully pushed in (threaded end (A) touching the pad (B) on the pedal arm). Then back off the switch 1/4 turn to make 0.3 mm (0.01 in.) of clearance between the threaded end and pad. Tighten the locknut firmly.
   Connect the brake pedal position switch connector. Make sure that the brake lights go off when the pedal is released.

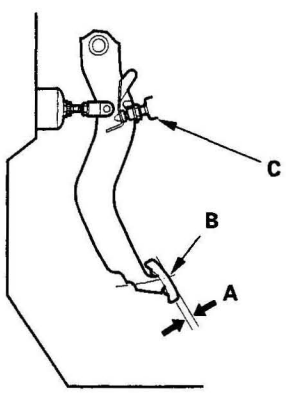


5. Check the brake pedal free play as described below.

Pedal Free Play

1. With the engine off, inspect the pedal free play (A) on the pedal pad (B) by pushing the pedal by hand.

   Free Play: 1—5 mm (1/16—3/16 in.)



2. If the pedal free play is out of specification, adjust the brake pedal position switch (C). If the pedal free play is insufficient, it may result in brake drag.

BACK

Protected by AR

Parking Brake Check and Adjustment

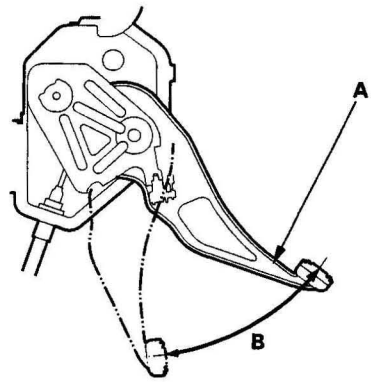
Check

1. Press the parking brake pedal (A) with 294 N (30 kgf, 66 lbf) of force. The parking brake pedal should travel within the specified number of clicks (B).

   Pedal Notches: 2–4

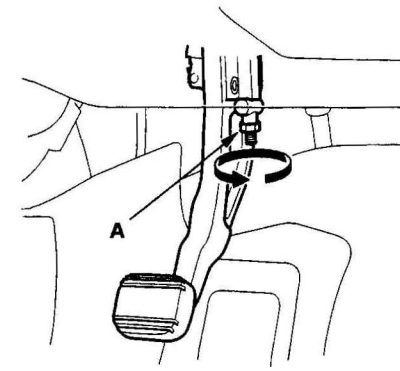
   If the number of clicks is excessive, adjust the parking brake pedal.
   Minor parking brake pedal adjustment (1 – 2 clicks) can be made with the adjusting nut in the parking brake pedal.
   If a larger adjustment is required, follow the major adjustment procedure using the adjuster at the parking brake drum.

   NOTE: After installing new brake shoes and/or new rear brake disc/drums, make sure you drive the vehicle for "Break-in" (see page 19-29).



Minor Adjustment

1. Raise the rear wheels off the ground, and support the vehicle on safety stands.
2. Tighten the adjusting nut (A) until the parking brakes drag slightly when the rear wheels are turned.



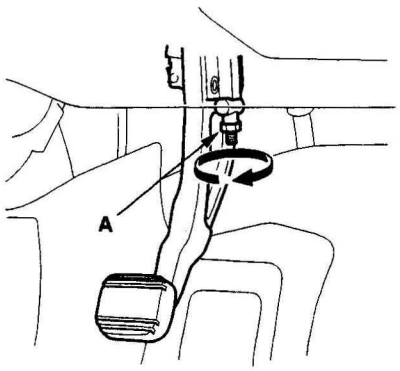
3. Back off the adjusting nut in half turn increments, and check for proper adjustment.

BACK

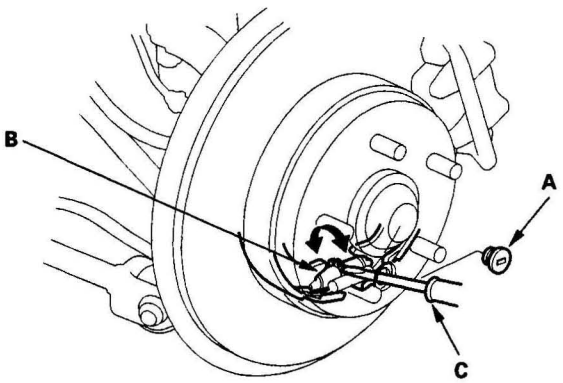
Protected by AR

Major Adjustment

1. Raise the rear wheels off the ground, and support the vehicle on safety stands.
2. Release the parking brake pedal, and back off the adjusting nut (A) in the parking brake pedal.



3. Remove the rear wheels.
4. Remove the access plug (A).



5. Turn the brake shoe adjuster (B) up with a flat blade screwdriver (C) until the shoes lock, then back off 8 notches.
6. Check the number of clicks by pressing the parking brake pedal with 294 N (30 kgf, 66 lbf) of force.

   Pedal Clicks: **2–4**

   If number of clicks exceed the specification, follow the minor adjustment procedure.
7. Install the access plug and rear wheels.

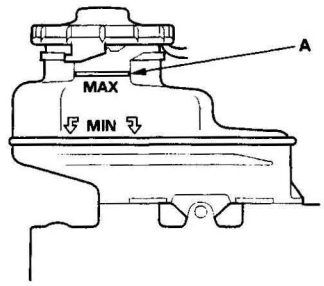
Protected by AR

Brake System Bleeding

NOTE:
- Do not reuse the drained fluid.
- Always use Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not spill brake fluid on the vehicle, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of bleeding procedure and checked after bleeding each brake caliper. Add fluid as required.

Conventional Method

1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line (A).



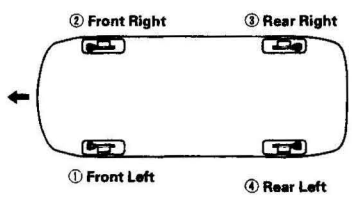
2. Attach a length of clear drain tube to the bleed screw.

3. Have someone slowly pump the brake pedal several times, then apply steady pressure.

4. Loosen the left-front brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.

5. Repeat the procedure for each wheel in the sequence shown until air bubbles no longer appear in the fluid coming out of the drain tube.

BLEEDING SEQUENCE:



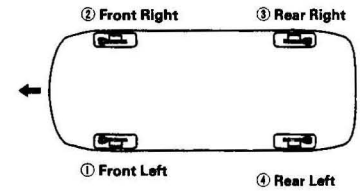
6. Refill the master cylinder reservoir to the MAX (upper) level line.

Pressure Bleeding

1. Install the appropriate power probe pressure bleeder adapter onto the master cylinder.

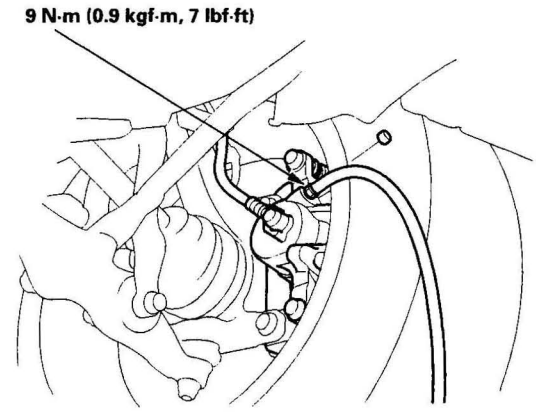
2. Use the bleeding sequence below, and follow the bleeding instructions that come with your pressure bleeder.

BLEEDING SEQUENCE:

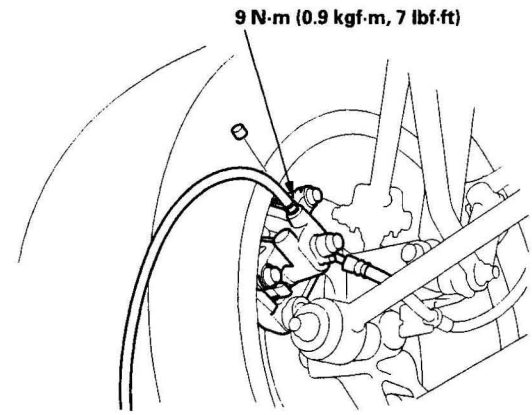


Bleed Screw Locations

FRONT:



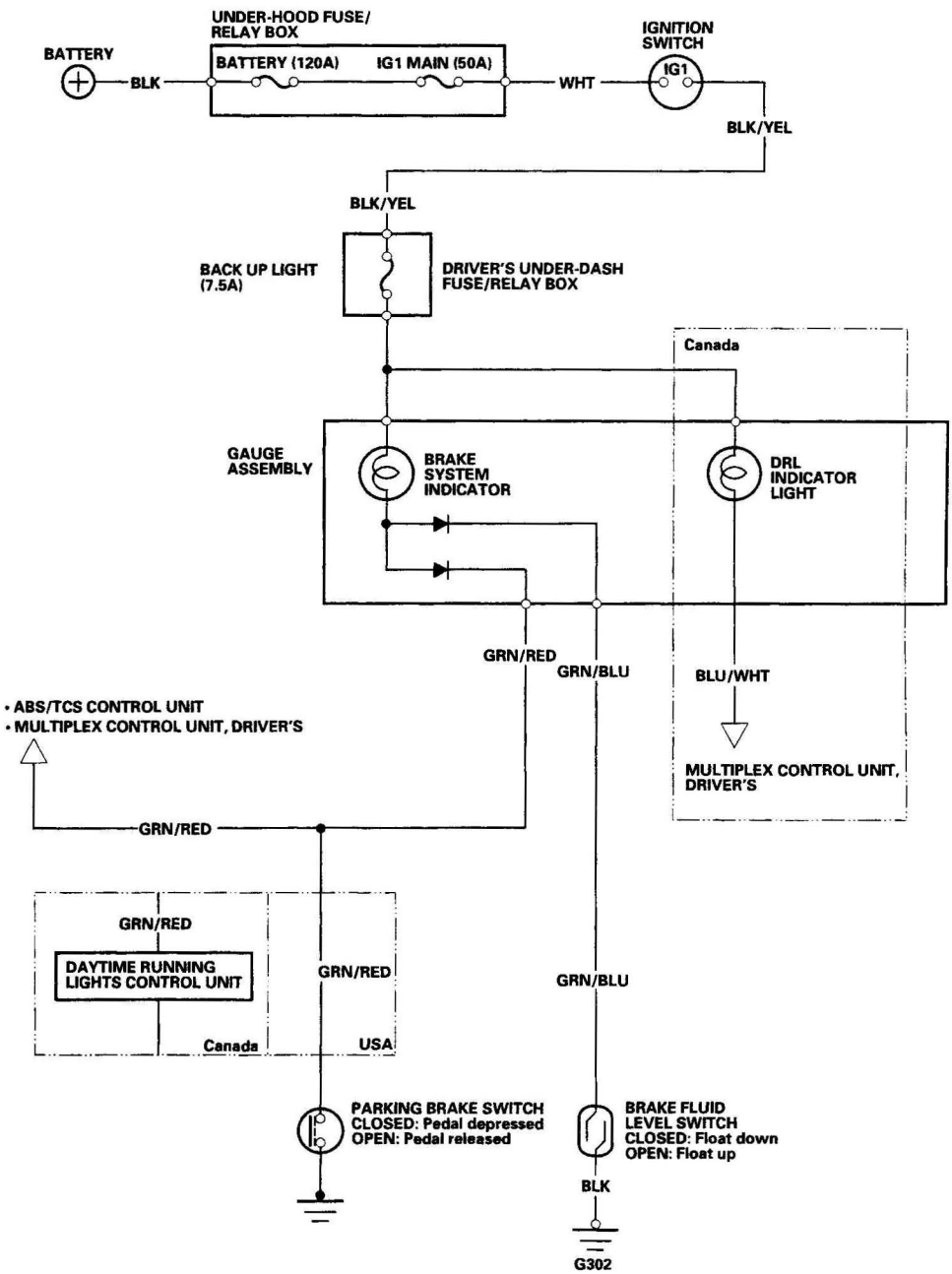
REAR:



BACK

Protected by AR

Brake System Indicator Circuit Diagram

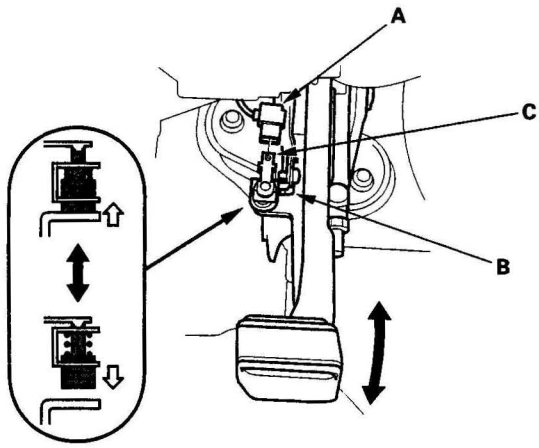


BACK

Protected by AR

Parking Brake Switch Test

1. Disconnect the parking brake switch connector (A) from the switch (B).

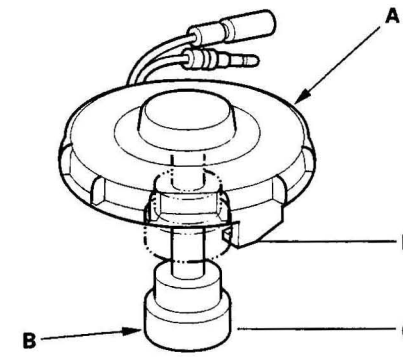


2. Check for continuity between the positive terminal (C) and body ground.
   - With the parking brake pedal pressed, there should be continuity.
   - With the parking brake pedal released, there should be no continuity.

NOTE(Canada): If the parking brake switch is OK, but the brake system indicator does not function, do the input test for the daytime running lights control unit (see page 22-163).

Brake Fluid Level Switch Test

1. Remove the reservoir cap (A). Check that the float (B) moves up and down freely; if it doesn't, replace the reservoir cap assembly.



2. Check for continuity between the terminals with the float in the down position (C) and the up position (D):
   - With the float up, there should be no continuity.
   - With the float down, there should be continuity.

BACK

Protected by AR

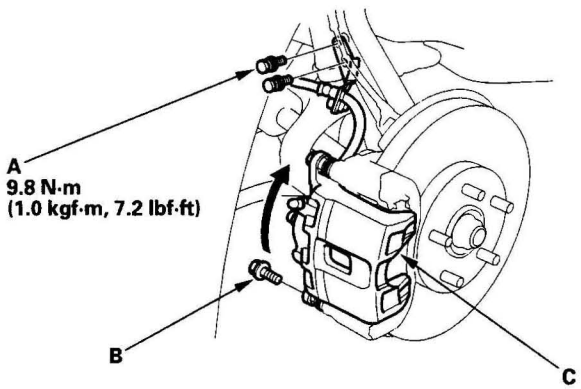
Front Brake Pads Inspection and Replacement

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

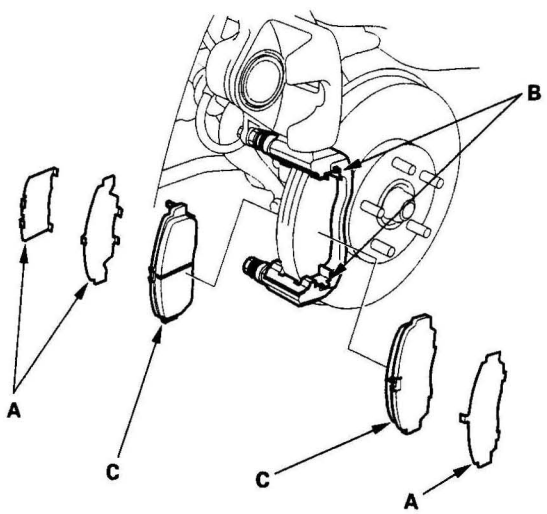
1. Loosen the front wheel nuts slightly. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.

2. Remove the brake hose mounting bolts (A) from the knuckle.



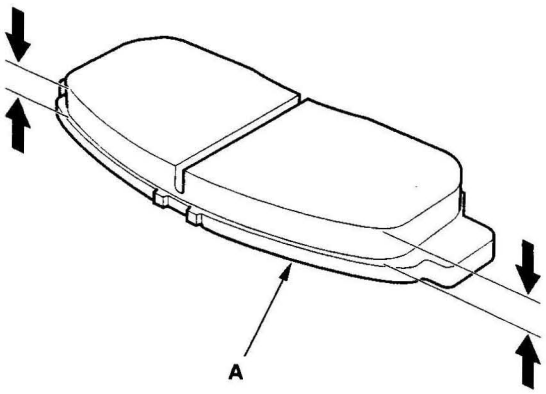
3. Remove caliper bolt, and pivot the caliper (C) up out of the way. Check the hoses and pin boots for damage and deterioration.

4. Remove the pad shims (A), pad retainers (B), and pads (C).



5. Using vernier calipers, measure the thickness of each brake pad lining. The measurement does not include pad backing plate (A) thickness.

Brake Pad Thickness:
Standard: 10.5—11.5 mm (0.41—0.45 in.)
Service Limit: 1.6 mm (0.06 in.)

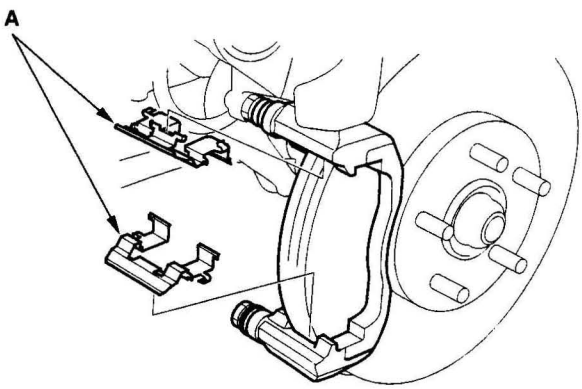


6. If the brake pad thickness is less than the service limit, replace the front pads as a set.

7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.

8. Check the brake disc for damage and cracks.

9. Install the pad retainers (A).

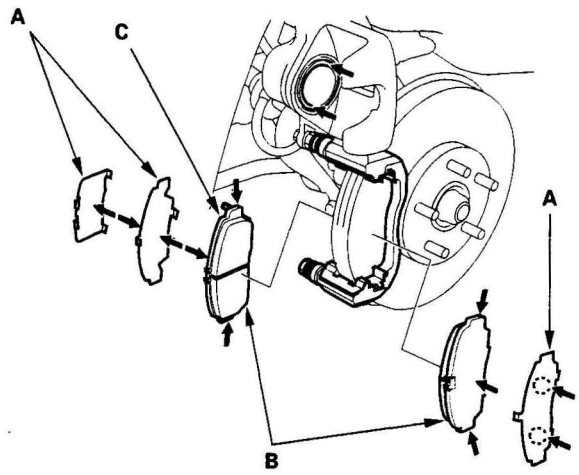


(cont'd)

Protected by AR

Front Brake Pads Inspect and Replacement (cont'd)

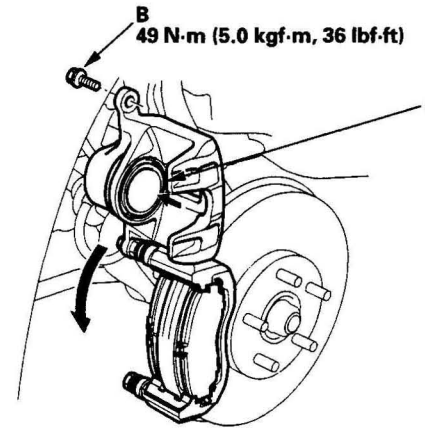
10. Apply Molykote M77 grease or Daikalub 528D grease to the pad side of the shims (A) and back of the pads (B). Wipe excess grease off the shim. Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.



11. Install the brake pads and pad shims correctly. Install the pad with the wear indicator (C) on the inside.

    If you are reusing the pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.

12. Push in the piston (A) so the caliper will fit over the pads. Make sure the piston boot is in position to prevent damaging it when pivoting the caliper down.



13. Pivot the caliper down into position. Being careful not to damage the pin boot, install the caliper bolt (B), and torque it to proper specification.

14. Install the brake hose onto the knuckle.

15. Press the brake pedal several times to make sure the brakes work, then road-test.

    NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

16. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

BACK

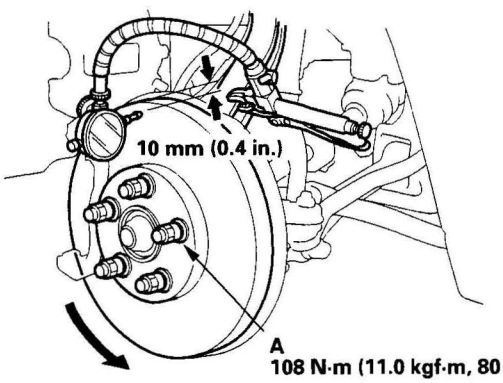
Protected by AR

Front Brake Disc Inspection

Runout

1. Loosen the front wheel nuts slightly, then raise the vehicle and make sure it is securely supported. Remove the front wheels.
2. Remove the brake pads (see page 19-11).
3. Inspect the disc surface for damage and cracks. Clean the disc thoroughly, and remove all rust.
4. Use wheel nuts and suitable flat washers (A) to hold the disc securely against the hub, then mount a dial indicator as shown, and measure the runout at 10 mm (0.4 in.) from the outer edge of the disc.

   Brake Disc Runout:
   Service Limit: 0.10 mm (0.004 in.)



5. If the disc is beyond the service limit, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation. When refinishing a front brake disc make sure the TCS switch is OFF.

   Max. Refinish Limit: 26.0 mm (1.02 in.)

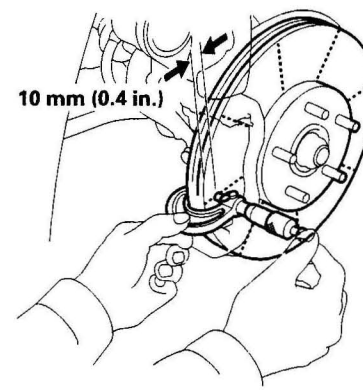
   NOTE:
   - If the brake disc is beyond the service limit for refinishing, replace it (see page 18-10).
   - A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).

Thickness and Parallelism

1. Loosen the front wheel nuts slightly, then raise the vehicle and make sure it is securely supported. Remove the front wheels.
2. Remove the brake pads (see page 19-11).
3. Using a micrometer, measure disc thickness at 8 points, approximately 45° apart and 10 mm (0.4 in.) in from the outer edge of the disc. Replace the brake disc if the smallest measurement is less than the max. refinishing limit.

   Brake Disc Thickness:
   Standard: 27.9–28.1 mm (1.10–1.11 in.)
   Max. Refinishing Limit: 26.0 mm (1.02 in.)
   Brake Disc Parallelism: 0.015 mm (0.0006 in.) max.

   NOTE: This is the maximum allowable difference between the thickness measurements.



4. If the disc is beyond the service limit for parallelism, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation. When refinishing a front brake disc, make sure the TCS switch is OFF.

   NOTE: If the brake disc is beyond the service limit for refinishing, replace it (see page 18-10).

Protected by AR

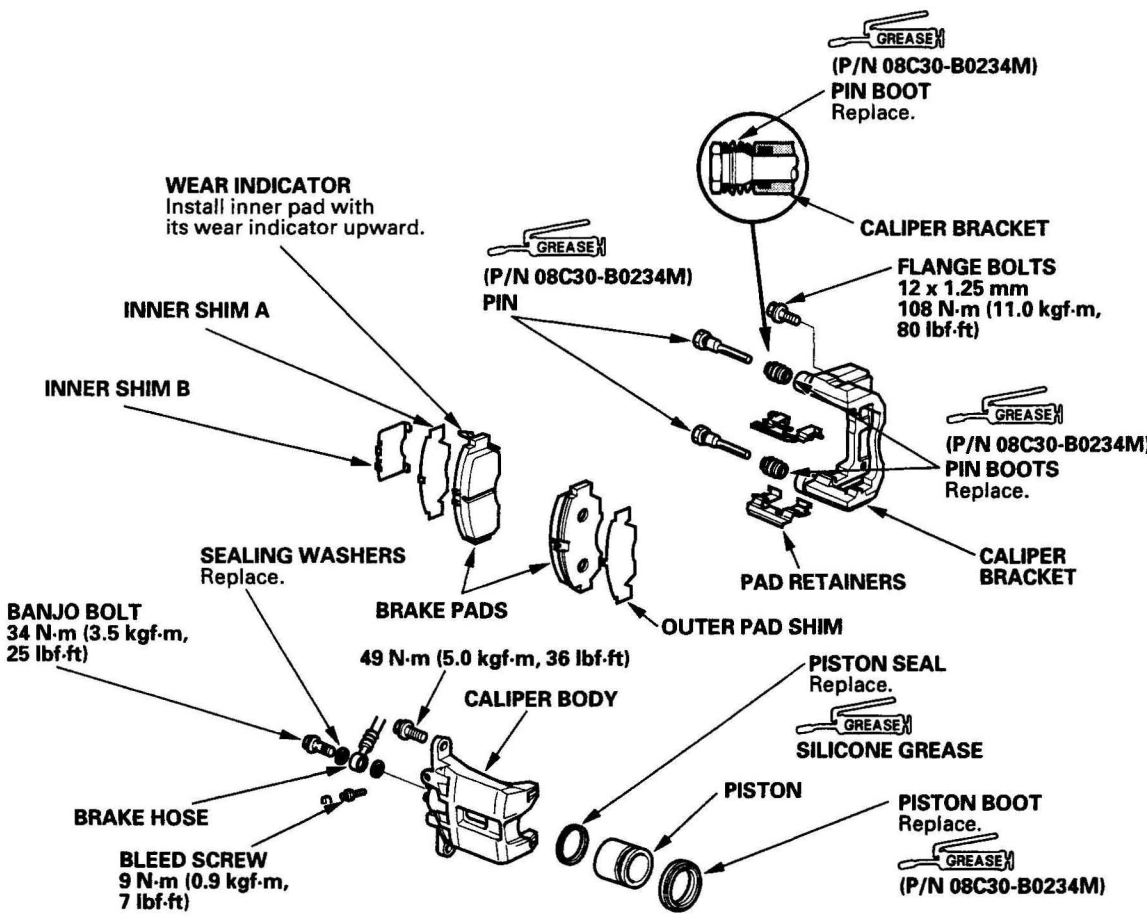
Front Brake Caliper Overhaul

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping, cover disconnected hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter gets in the brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- When reusing pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid.
- Always use Honda DOT 3 Brake Fluid. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.



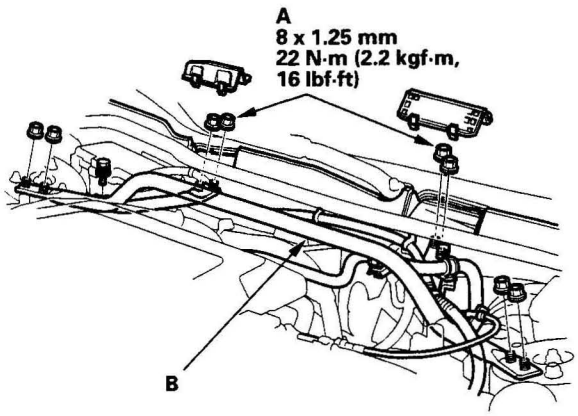
BACK

Protected by AR

Master Cylinder Replacement

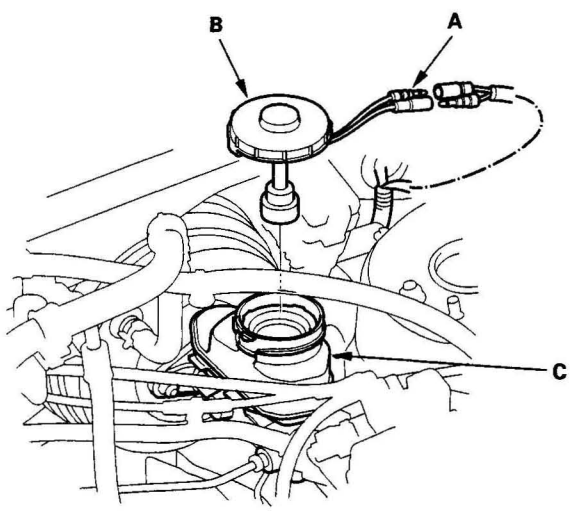
NOTICE
Do not spill brake fluid on the vehicle; it may damage the paint. If brake fluid does contact the paint, wash it off immediately with water.

1. Remove the 8 mm flange nuts (A).



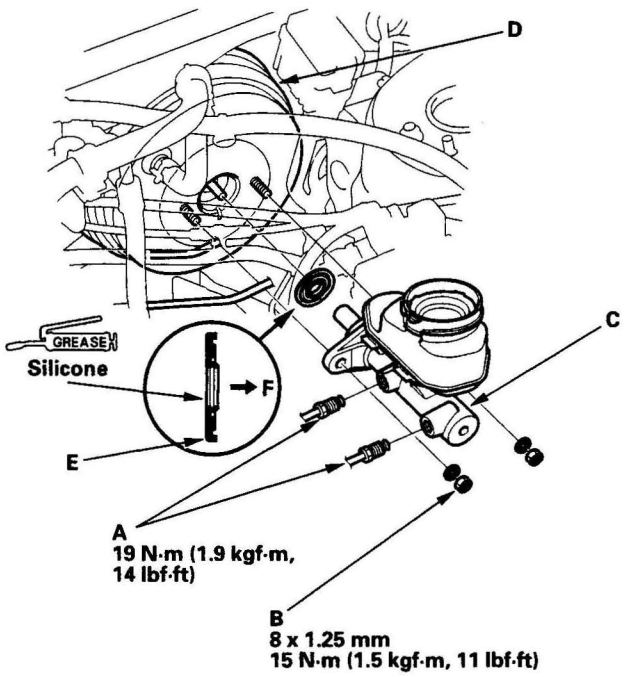
2. Remove the strut brace (B).

3. Disconnect the brake fluid level switch connectors (A), and remove the reservoir cap (B).



4. Remove the brake fluid from the master cylinder reservoir (C) with a syringe.

5. Disconnect the brake lines (A) from the master cylinder. To prevent spills, cover the hose joints with rags or shop towels.



6. Remove the master cylinder mounting nuts (B) and washers.

7. Remove the master cylinder (C) from the brake booster (D). Be careful not to bend or damage the brake lines when removing the master cylinder.

8. Remove the rod seal (E) from the master cylinder.

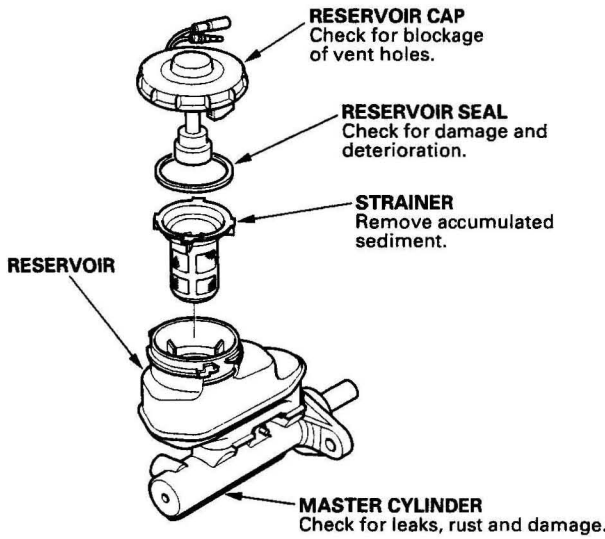
9. Install the master cylinder in the reverse order of removal, and note these items:

   - Replace all rubber parts with new ones whenever removed.
   - Coat the lip of the new rod seal with recommended seal grease in the master cylinder set.
   - Install the rod seal onto the master cylinder with its grooved side (F) toward the master cylinder.

Protected by AR

Master Cylinder Inspection

NOTE:
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Do not try to disassemble the master cylinder assembly. Replace the master cylinder assembly with a new part if necessary.
- Do not allow dirt or foreign matter to contaminate the brake fluid.

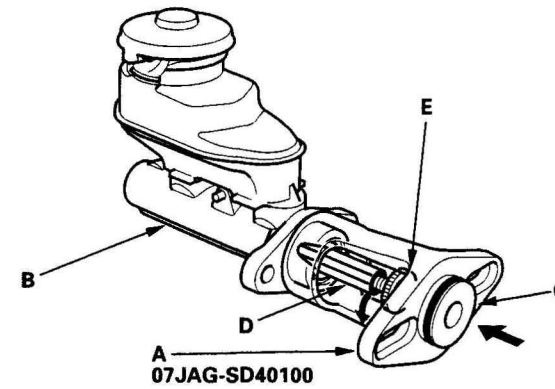


Master Cylinder Pushrod Clearance Adjustment

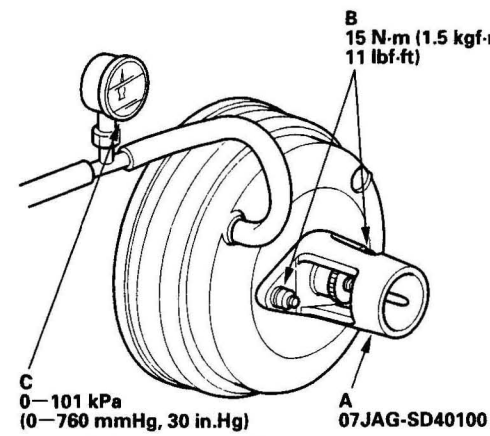
Special Tool Required
Pushrod adjustment gauge 07JAG-SD40100

NOTE: Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing master cylinder.

1. Set the special tool (A) on the master cylinder body (B), push in the center shaft (C) until the top of it contacts the end of the secondary piston (D) by turning the adjusting nut (E).



2. Without disturbing the center shaft's position, install the special tool (A) onto the booster.



3. Install the master cylinder nuts (B), and tighten to the specified torque.

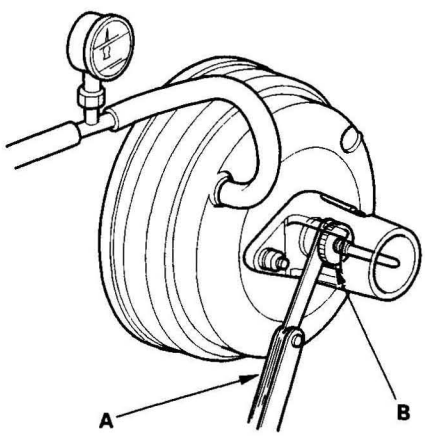
4. Connect the booster in-line with a vacuum gauge (C) 0—101 kPa (0—760 mmHg, 30 in.Hg) to the booster's engine vacuum supply, and maintain an engine speed that will deliver 66 kPa (500 mmHg, 20 in.Hg) vacuum.

BACK

Protected by AR

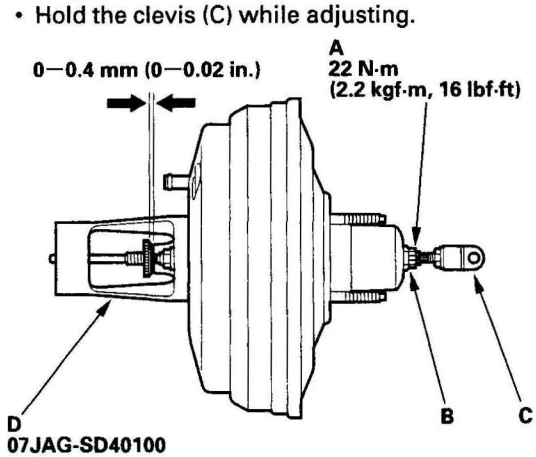
5. With a feeler gauge (A), measure the clearance between the gauge body and the adjusting nut (B) as shown.
   If the clearance between the gauge body and adjusting nut is 0.4 mm (0.02 in.), the pushrod-to-piston clearance is 0 mm. However, if the clearance between the gauge body and adjusting nut is 0 mm, the pushrod-to-piston clearance is 0.4 mm (0.02 in.) or more. Therefore it must be adjusted and rechecked.

   Clearance: 0—0.4 mm (0—0.02 in.)



6. If the clearance is incorrect, loosen the star locknut (A), and turn the adjuster (B) in or out to adjust.

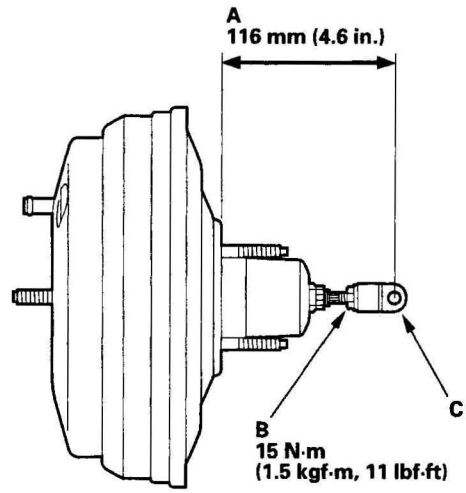
   - Adjust the clearance while the specified vacuum is applied to the booster.
   - Hold the clevis (C) while adjusting.



7. Tighten the star locknut securely.

8. Remove the special tool (D).

9. Check the pushrod length (A) as shown if the booster is removed. If the length is incorrect, loosen the pushrod locknut (B), and turn the clevis (C) in or out to adjust.



10. Install the master cylinder (see page 19-15).

BACK

Protected by AR

Brake Booster Test

Functional Test

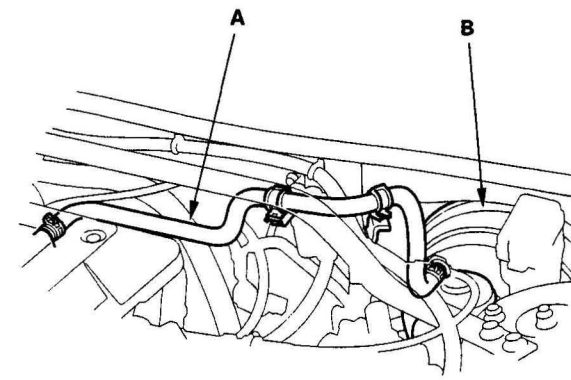
1. With the engine stopped, press the brake pedal several times to deplete the vacuum reservoir, then press the pedal hard and hold it for 15 seconds. If the pedal sinks, either the master cylinder is bypassing internally, or the brake system (master cylinder, lines, modulator, proportioning valve, or caliper) is leaking.
2. Start the engine with the pedal pressed. If the pedal sinks slightly, the vacuum booster is operating normally. If the pedal height does not vary, the booster or check valve is faulty.
3. With the engine running, press the brake pedal lightly. Apply just enough pressure to hold back automatic transmission creep. If the brake pedal sinks more than 10 mm (3/8 in.) in 3 minutes, the master cylinder is faulty. A slight change in pedal height when the A/C compressor cycles on and off is normal. (The A/C compressor load changes the vacuum available to the booster.)

Leak Test

1. Press the brake pedal with the engine running, then stop the engine. If the pedal height does not vary while pressed for 30 seconds, the vacuum booster is OK. If the pedal rises, the booster is faulty.
2. With the engine stopped, press the brake pedal several times using normal pressure. When the pedal is first pressed, it should be low. On consecutive applications, the pedal height should gradually rise. If the pedal position does not vary, check the booster check valve.

Booster Check Valve Test

1. Disconnect the brake booster vacuum hose (check valve built-in) (A) at the booster (B).



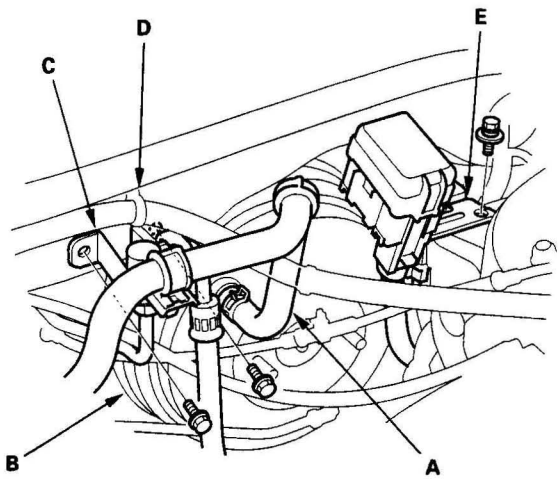
2. Start the engine, and let it idle. There should be vacuum available. If no vacuum is available, the check valve is not working properly. Replace the brake booster vacuum hose and check valve, and retest.

BACK

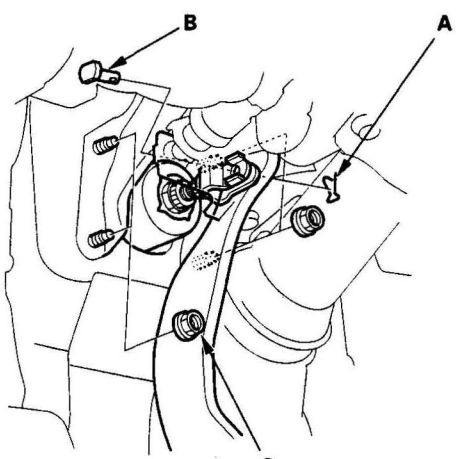
Protected by AR

Brake Booster Replacement

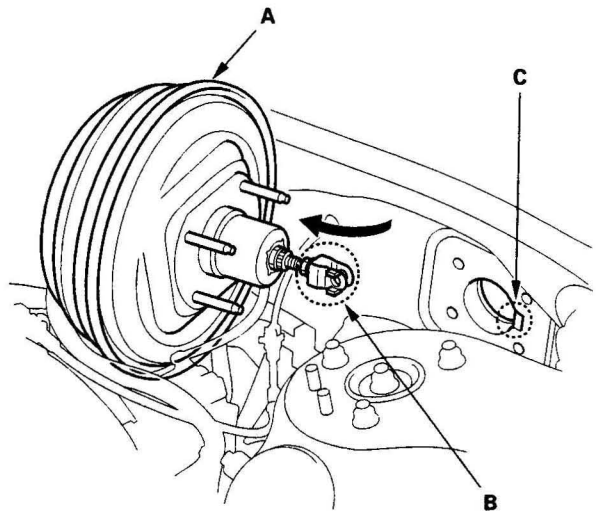
1. Remove the master cylinder (see page 19-15).
2. Disconnect the vacuum hose (A) from the brake booster (B).



3. Remove the fuel feed line bracket (C).
4. Remove the starter cable clamps (D).
5. Remove the windshield wiper intermittent relay bracket (E).
6. Remove the lock pin (A) and clevis pin (B).



7. Remove the four booster mounting nuts (C).
8. Pull the brake booster (A) forward, then turn it to the right until the clevis (B) is clear of the bulkhead (C).



9. Install the brake booster in the reverse order of removal, and note these items:
   - Adjust the pushrod length before installing the brake booster.
   - Use a new lock pin.
   - After installation, adjust the brake pedal height and brake pedal free play (see page 19-5).

Protected by AR

Rear Brake Pads Inspection and Replacement

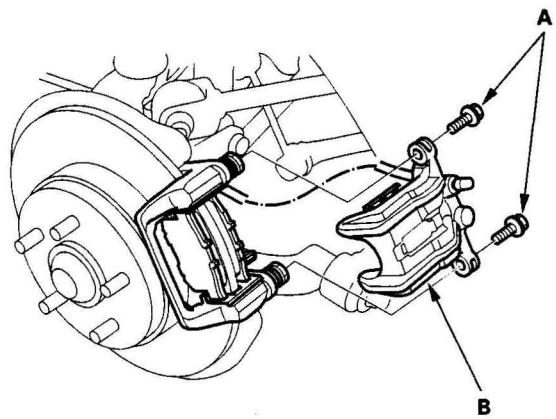
⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

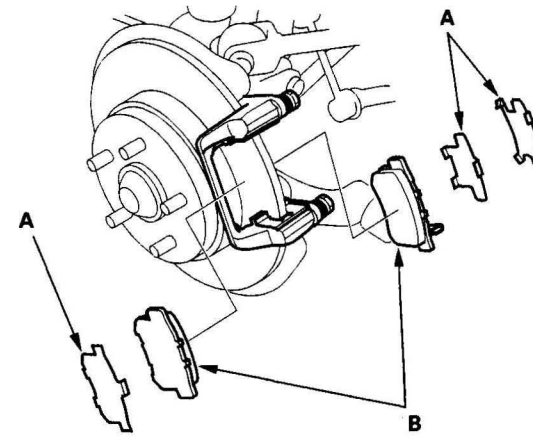
1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheel.

2. Release the parking brake.

3. Remove the brake hose from the suspension arm by removing the mounting bolt, then remove the two caliper bolts (A) and caliper (B) from the bracket.
   Thoroughly clean the outside of the caliper to prevent dust and dirt from entering inside.
   Support the caliper with a piece of wire so that it does not hang from the brake hose.

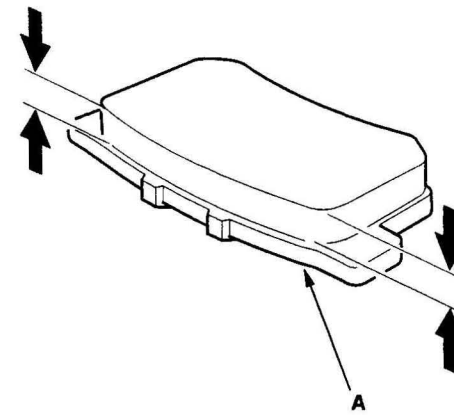


4. Remove the pad shims (A) and brake pads (B).



5. Using vernier calipers, measure the thickness of each brake pad lining. Measurement does not include pad backing plate (A) thickness.

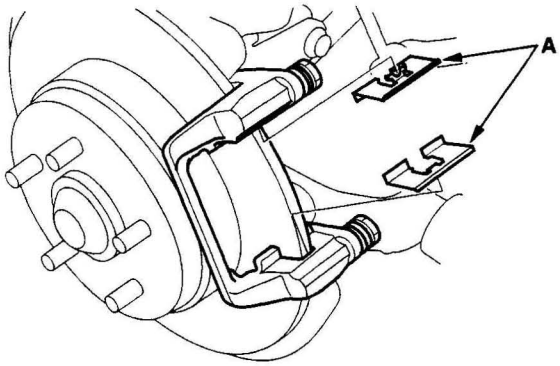
Brake Pad Thickness:
Standard: 8.5−9.5 mm (0.33−0.37 in.)
Service Limit: 1.6 mm (0.06 in.)



BACK

Protected by AR

6. Remove the pad retainers (A).

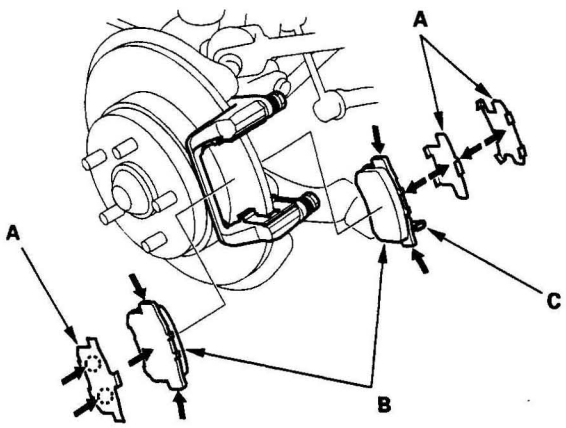


7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.

8. Check the brake disc for damage and cracks.

9. Install the pad retainers.

10. Apply Molykote M77 grease or Daikalub 528D grease to the pad side of the shims (A) and back of the pads (B). Wipe excess grease off the shim. Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.

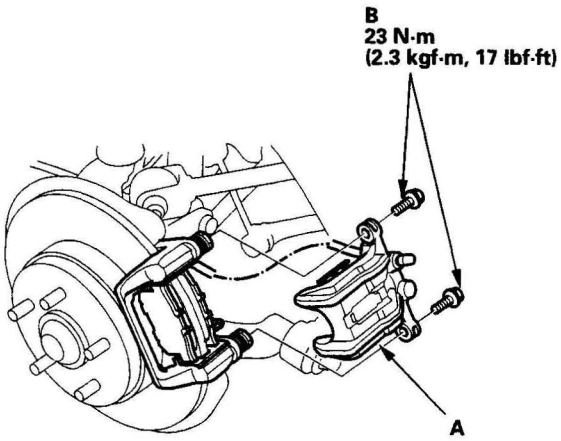


11. Install the brake pads (B) and pad shims on the caliper bracket. Install the inner pad with its wear indicator (C) facing downward.

    If you are reusing the pads, always reinstall the pads in their original positions to prevent a momentary loss of braking efficiency.

12. Push in the piston so the caliper will fit over the pads. Make sure the piston boot is in position to prevent damaging it when installing the caliper.

13. Install the brake caliper (A).



14. Install and torque the caliper bolts (B) to proper specification.

15. Install the brake hose onto the suspension arm with the mounting bolt.

16. After installation, check for leaks at hose and line joints and connections, and retighten if necessary.

17. Press the brake pedal several times to make sure the brakes work, then road-test.

    NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

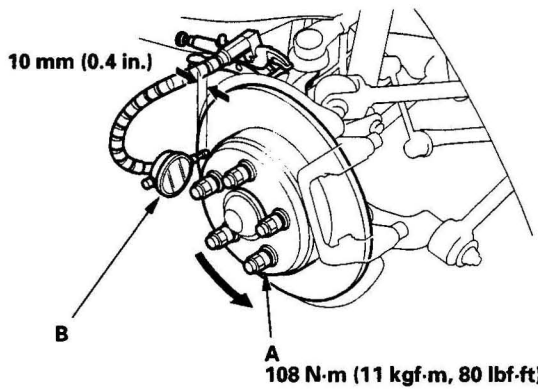
Protected by AR

Rear Brake Disc Inspection

Runout

1. Raise the rear of the vehicle, and make sure it is securely supported.
2. Remove the brake pads (see page 19-20).
3. Inspect the disc surface for damage and cracks. Clean the disc thoroughly, and remove all rust.
4. Use wheel nuts and suitable flat washers (A) to hold the disc securely against the hub, then mount a dial indicator (B) as shown, and measure the runout at 10 mm (0.4 in.) from the outer edge of the disc.

   Brake Disc Runout:
   Service Limit: 0.10 mm (0.004 in.)



5. If the disc is beyond the service limit, refinish the brake disc.

   Max. Refinishing Limit: 7.5 mm (0.30 in.)

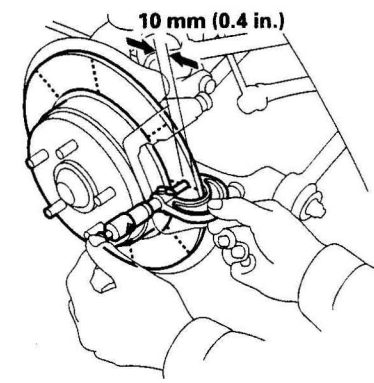
   NOTE: A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).

Thickness and parallelism

1. Loosen the rear wheel nuts slightly, then raise the vehicle and make sure it is securely supported. Remove the rear wheels.
2. Remove the brake pads (see page 19-20).
3. Using a micrometer (A), measure disc thickness at 8 points, approximately 45° apart and 10 mm (0.4 in.) in from the outer edge of the disc. Replace the brake disc if the smallest measurement is less than the max. refinishing limit.

   Brake Disc Thickness:
   Standard: 8.9—9.1 mm (0.350—0.358 in.)
   Max. Refinishing Limit: 7.5 mm (0.30 in.)
   Brake Disc Parallelism: 0.015 mm (0.0006 in.) max.

   This is the maximum allowable difference between the thickness measurements.



4. If the disc is beyond the service limit for parallelism, refinish the brake disc.

   NOTE: If the brake disc is beyond the service limit for refinishing, replace it (see page 18-22).

BACK

Protected by AR

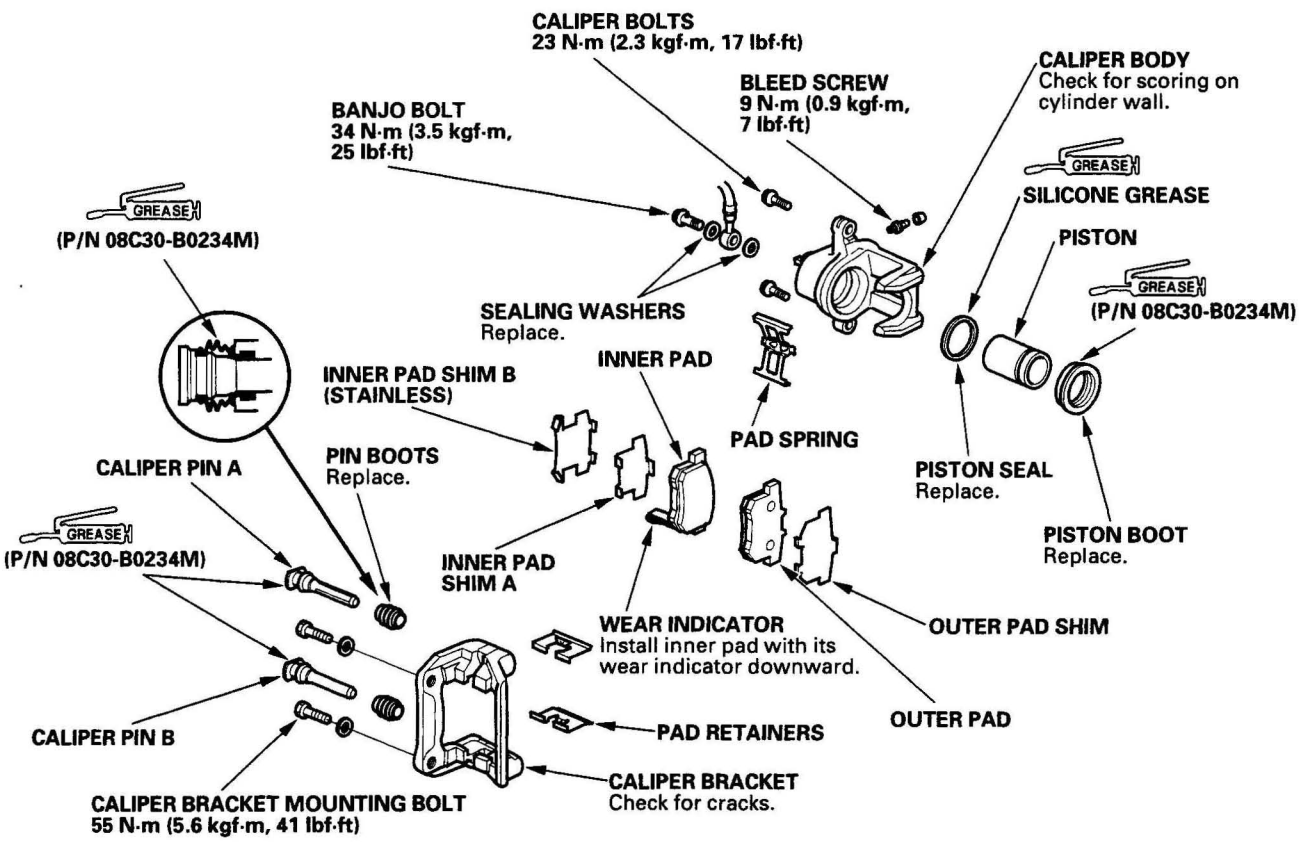
Rear Brake Caliper Overhaul

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter gets in the brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- When reusing pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid.
- Always use Honda DOT 3 Brake Fluid. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.



BACK

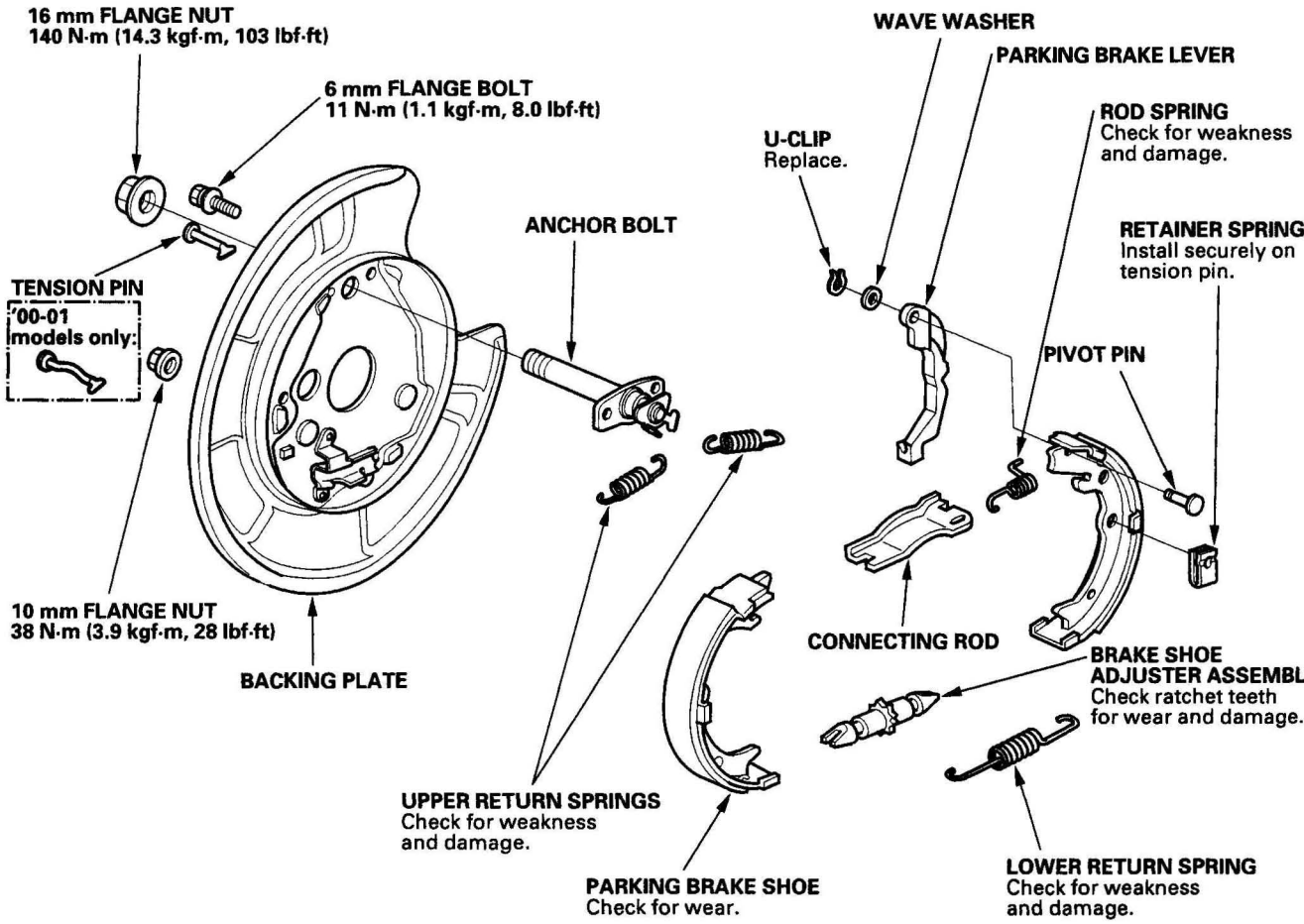
Protected by AR

Parking Brake Shoes and Drum Inspection

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

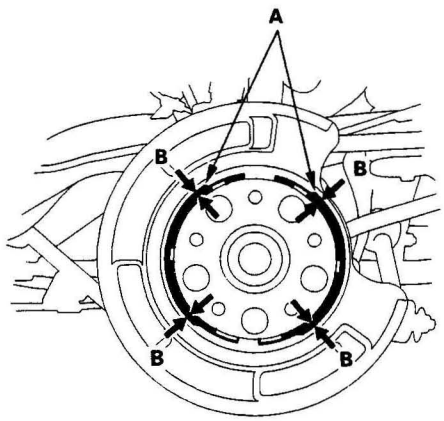
1. Block the front wheels, then raise the rear of the vehicle, and make sure it is securely supported.
2. Release the parking brake, and remove the rear caliper and rear brake disc/drum (see page 18-22).



BACK

Protected by AR

3. Check the parking brake linings (A) for cracking, glazing, wear, and contamination.



4. Measure the parking brake lining thickness (B). Measurement does not include brake shoe thickness.

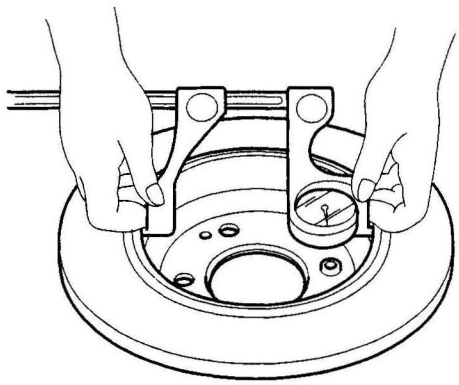
Parking Brake Lining Thickness:
Standard: 1.9–2.5 mm (0.075–0.098 in.)
Service Limit: 1.0 mm (0.04 in.)

5. If the brake lining thickness is less than the service limit, replace the parking brake shoes as a set.

6. Check the bearings in the hub unit for smooth operation.

7. Measure the inside diameter of the parking brake drum brake with inside vernier calipers.

Parking Brake Drum Inside Diameter:
Standard: 169.9–170.0 mm (6.689–6.693 in.)
Service Limit: 171.0 mm (6.732 in.)



8. If the inside diameter of the parking brake drum is more than the service limit, replace the rear brake disc/drum brake.

9. Check the parking brake drum for scoring, grooves, and cracks.

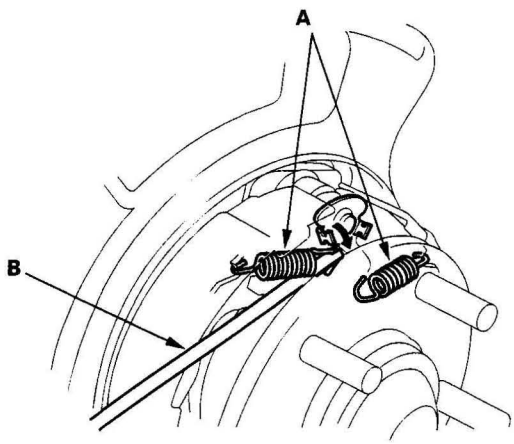
BACK

Protected by AR

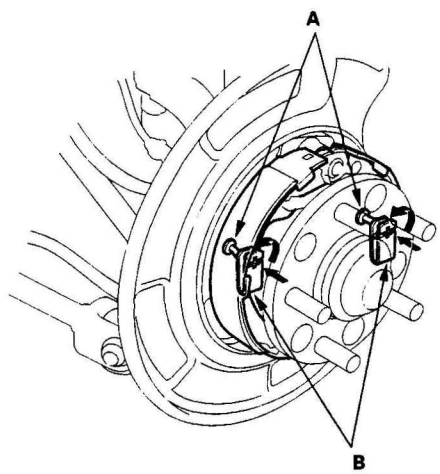
Parking Brake Shoes Replacement

NOTE:
- Contaminated brake linings or drums reduce stopping ability.
- Block the front wheels before jacking up the rear of the vehicle.

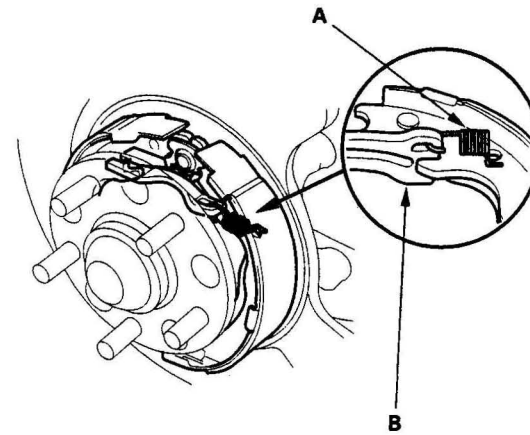
1. Raise the rear of the vehicle, and make sure it is securely supported.
2. Release the parking brake, and remove the rear caliper and rear brake disc/drum (see page 18-22).
3. Disengage the upper return spring (A) with the tool (B).



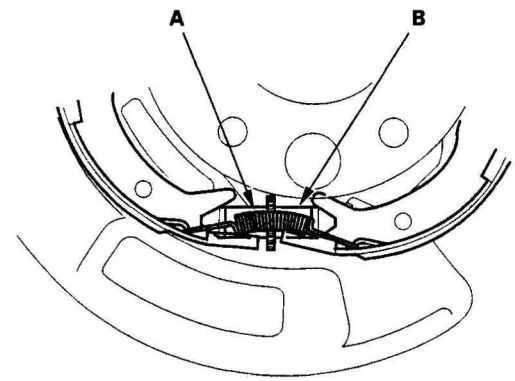
4. Remove the tension pins (A) by pushing the return spring (B).



5. Disconnect the rod spring (A), and remove the connecting rod (B).



6. Lower the parking brake shoe assembly, then separate the brake shoes by removing the lower return spring (A).

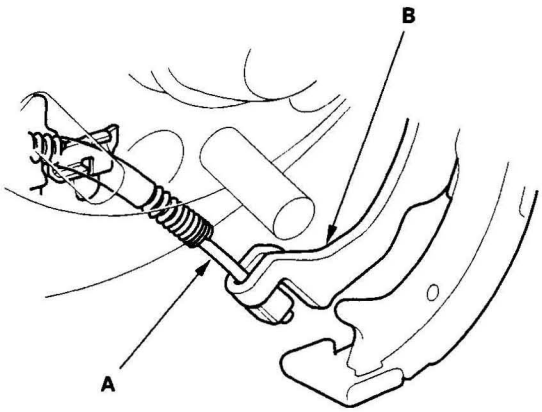


7. Remove the brake shoe adjuster assembly (B).

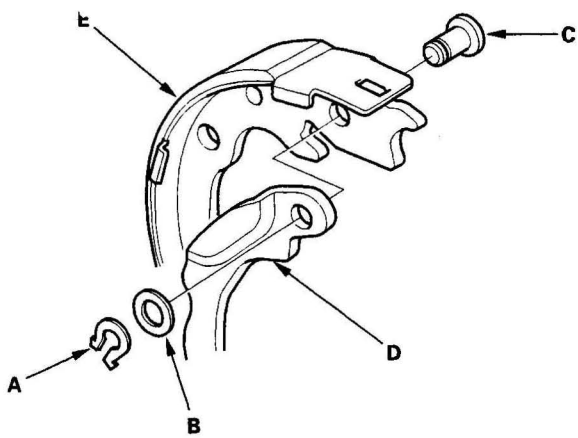
BACK

Protected by AR

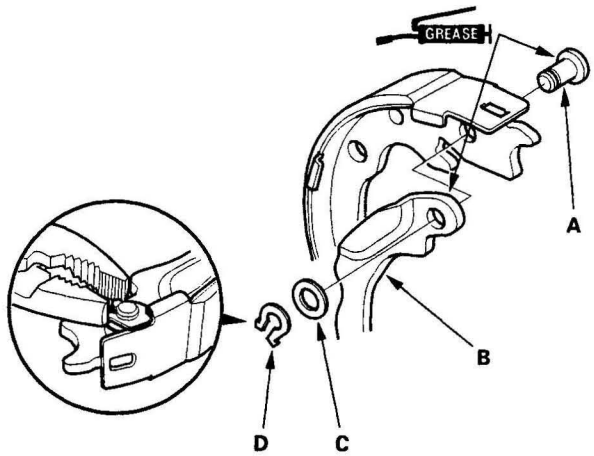
8. Remove the parking brake shoe by disconnecting the parking brake cable (A) from the parking brake lever (B).



9. Remove the U-clip (A), wave washer (B), pivot pin (C), and parking brake lever (D) from the parking brake shoe (E).



10. Apply Molykote 44 MA grease to the sliding surface of the pivot pin (A), and insert the pin into the parking brake shoe.



11. Install the parking brake lever (B) and wave washer (C) on the pivot pin, and secure them with a new U-clip (D).

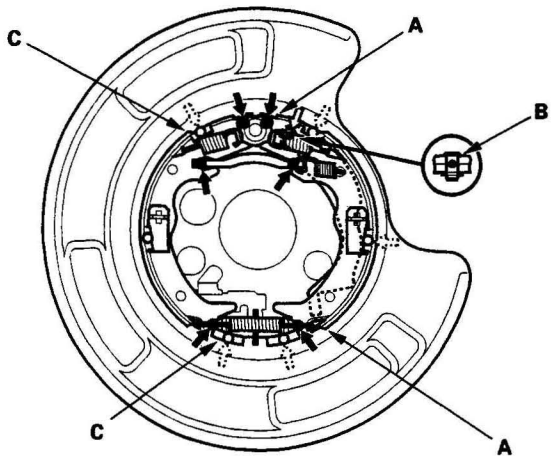
    - Install the wave washer with its convex side facing out.
    - Pinch the U-clip securely to prevent the pivot pin from coming out from the brake shoe.

(cont'd)

Protected by AR

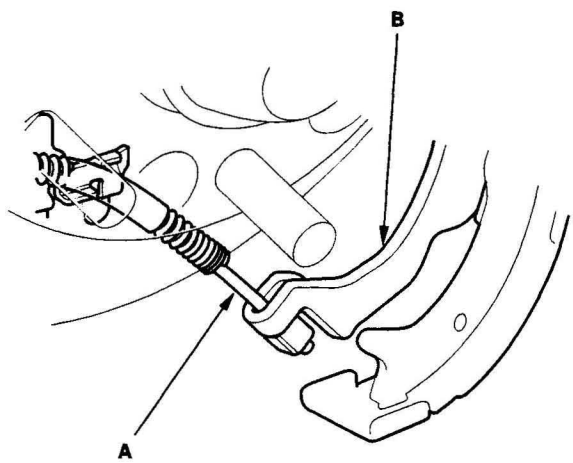
Parking Brake Shoes Replacement (cont'd)

12. Apply Molykote 44 MA grease to the shoe ends (A), sliding surface (B), and opposite edges of the parking brake shoe (C) as shown. Wipe off any excess. Don't get grease on the brake linings.

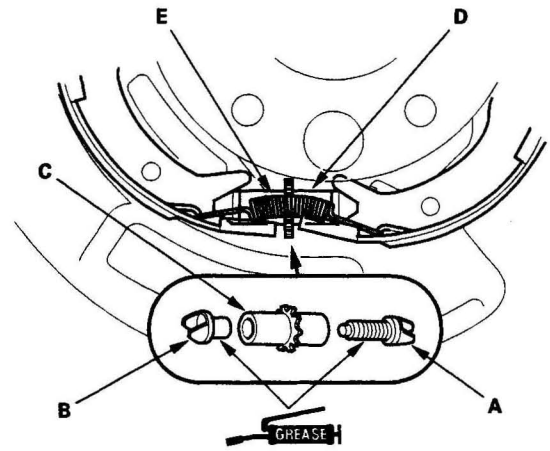


Greasing symbols:
- **Brake shoe ends**
- **Opposite the edge of the shoe**
- **Sliding surface**

13. Reconnect the parking brake cable (A) to the parking brake lever (B).

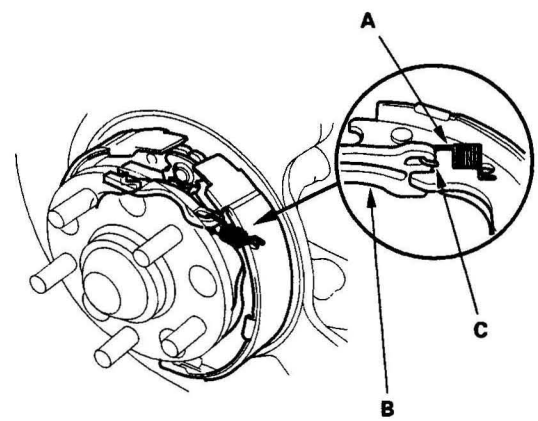


14. Clean the threaded portions of the clevis (A), and coat the threads of the clevis with grease. Clean the sliding surface of the clevis (B), and coat the sliding surface of the clevis B with grease.
Install the clevis A and B on the adjuster (C), and shorten the clevis A by turning the adjuster.



15. Reinstall the brake shoe adjuster assembly (D), and hook the lower return spring (E) on the parking brake shoes.

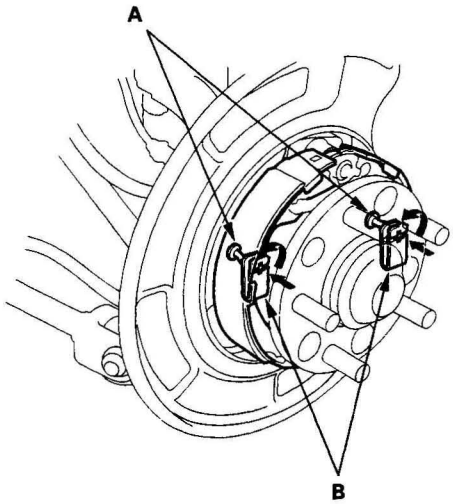
16. Hook the rod spring (A) to the connecting rod (B) first with the spring end (C) pointing downward. Then hook the rod spring to the parking brake shoe, and install the connecting rod on the parking brake shoes.



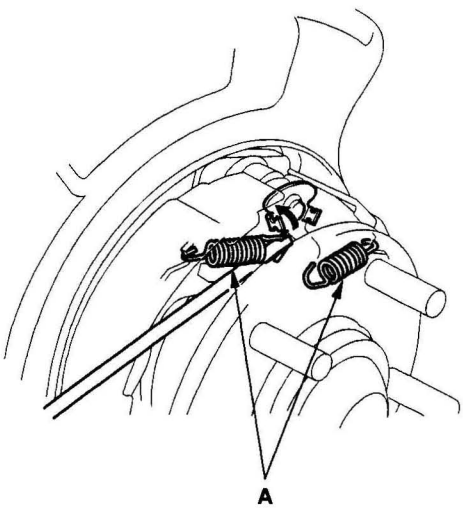
BACK

Protected by AR

17. Reinstall the tension pins (A) and retainer springs (B). Make sure the tension pin does not contact the parking brake lever.



18. Reinstall the upper return springs (A).



19. Reinstall the rear brake disc/drum and rear brake caliper (see step 12 on page 18-23).

20. Adjust the parking brake (see page 19-6).

Parking Brake Lining Break-in

NOTE:
- Do brake linings surface break-in when replacing shoes with new linings and/or new rear brake disc.
- Check the number of parking brake pedal clicks. Adjust the pedal before lining surface break-in (see page 19-6).

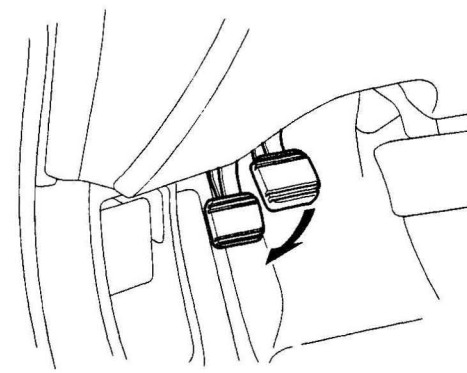
⚠ WARNING

Perform this operation in a safe area.

1. Park the vehicle on a firm, level surface.

2. Release the parking brake pedal.

3. Press the parking brake pedal 1 click while driving the vehicle at the about 31 mph (50 km/h) for 400 m (1/4 mile).



4. Stop the vehicle for 5 – 10 minutes to allow the drums to cool. Repeat step 3.

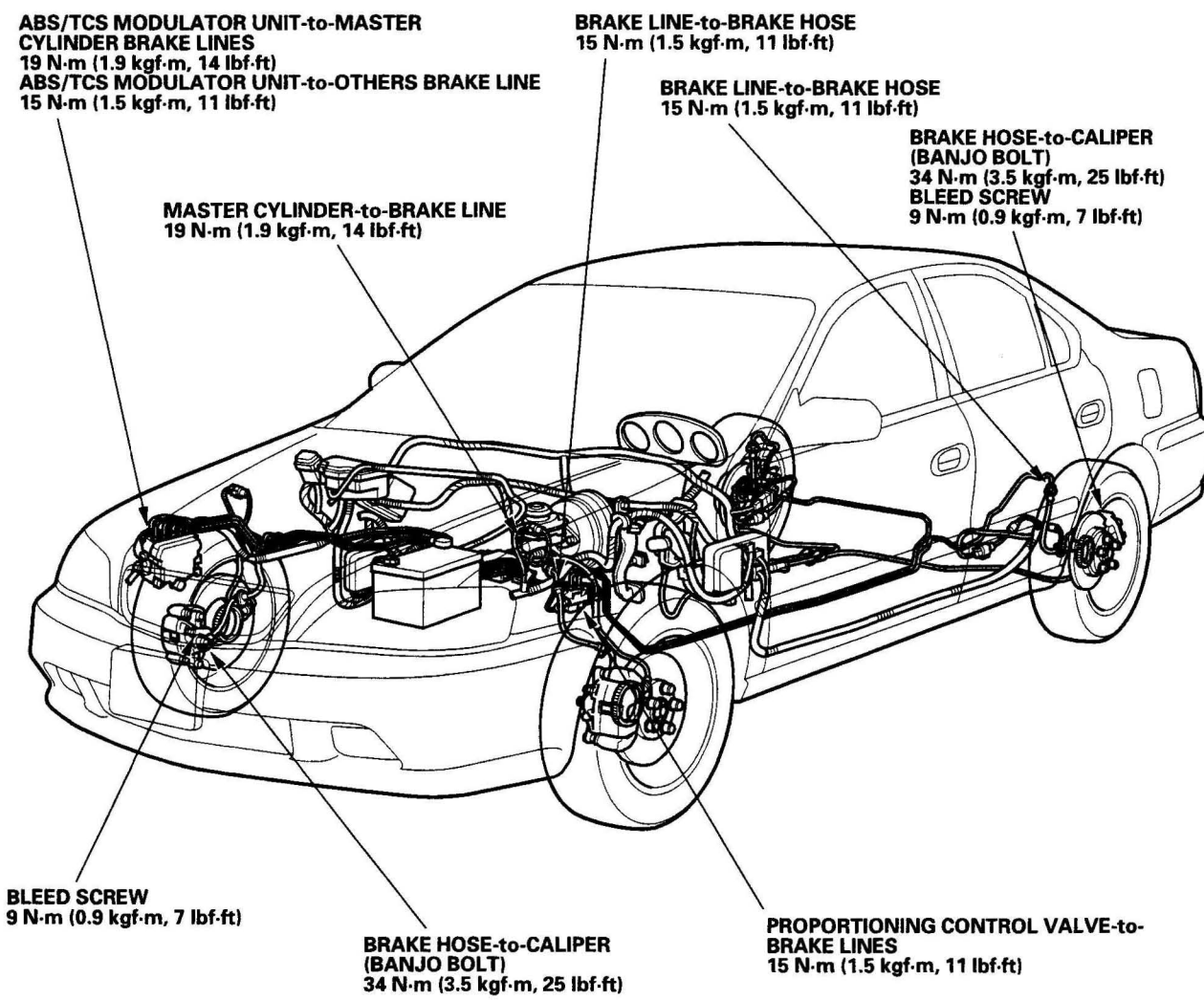
5. Check the parking brake pedal adjustment (see page 19-6).

Protected by AR

Brake Hoses and Lines Inspection

1. Inspect the brake hoses for damage, cracks, leaks, interference, and twisting.
2. Check the brake lines for damage, rusting, and leakage. Also check for bent brake lines.
3. Check for leaks at hose and line joints or connections, and retighten if necessary.
4. Check the master cylinder and ABS/TCS modulator unit for damage and leakage.

   NOTE: Replace the brake hose clip whenever the brake hose is serviced.



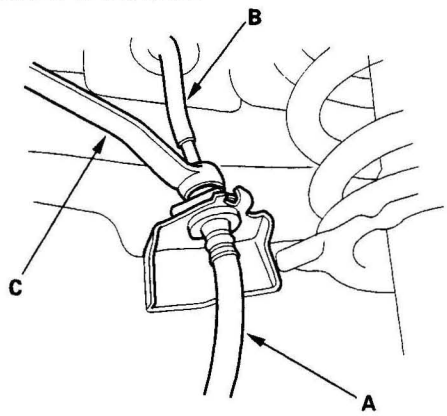
BACK

Protected by AR

Brake Hose Replacement

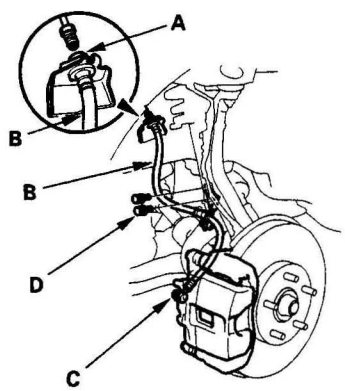
NOTE:
- Before reassembling, check that all parts are free of dust and other foreign materials.
- Replace parts with new ones whenever specified to do so.
- Do not spill brake fluid on the vehicle; it may damage the paint. If brake fluid gets on the paint, wash it off immediately with water.

1. Replace the brake hose (A) if the hose is twisted, cracked, or if it leaks.



2. Disconnect the brake hose from the brake line (B) using a 10 mm flare-nut wrench (C).

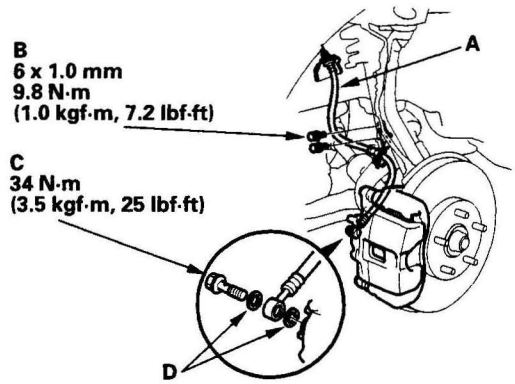
3. Remove and discard the brake hose clip (A) from the brake hose (B).



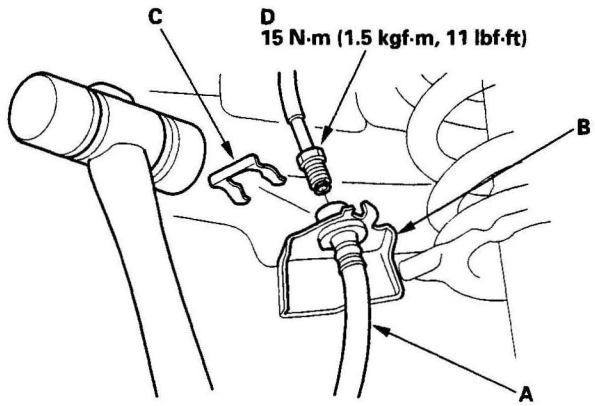
4. Remove the banjo bolt (C), and disconnect the brake hose from the caliper.

5. Remove the brake hose from the knuckle by removing the 6 mm flange bolts (D).

6. Install the brake hose (A) on the knuckle with 6 mm flange bolts (B) first, then connect the brake hose to the caliper with the banjo bolt (C) and new sealing washers (D).



7. Install the brake hose (A) on the upper brake hose bracket (B) with a new brake hose clip (C).



8. Connect the brake line (D) to the brake hose.

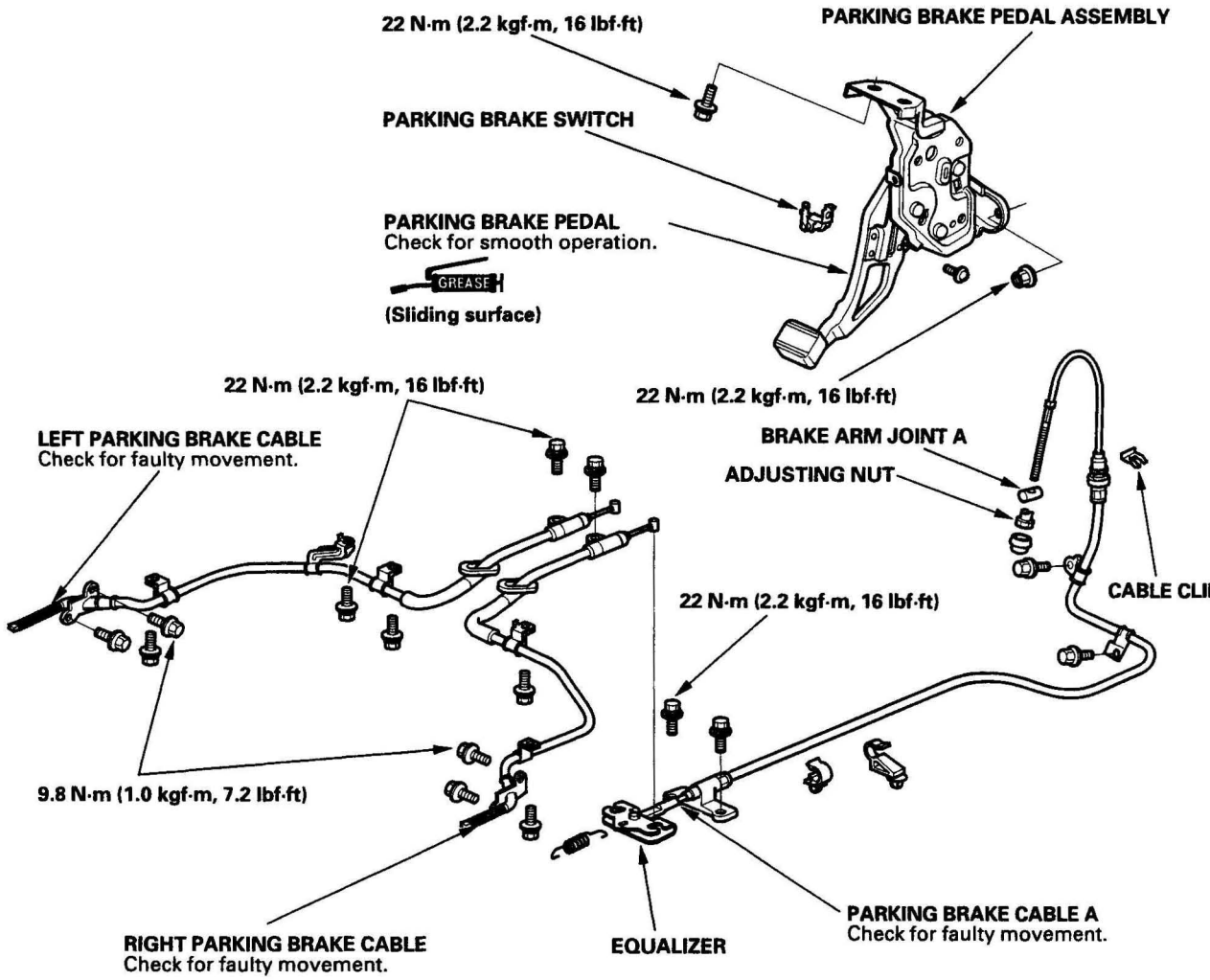
9. After installing the brake hose, bleed the brake system (see page 19-8).

10. Do the following checks:
    - Check the brake hose and line joint for leaks, and tighten if necessary.
    - Check the brake hoses for interference and twisting.

Protected by AR

Parking Brake Cable Replacement

Exploded View



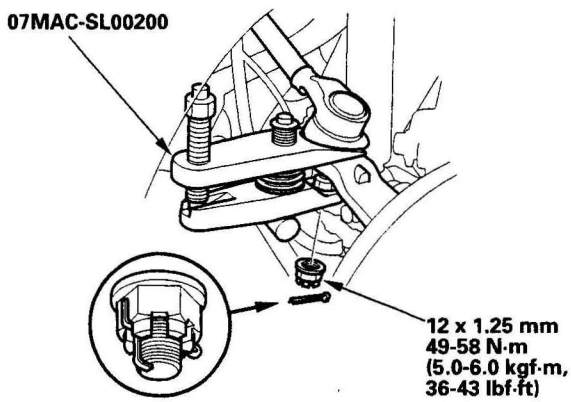
BACK

Protected by AR

NOTE: The parking brake cable must not be bent or distorted. This will lead to stiff operation and premature cable failure. Refer to the Exploded View as needed during this procedure.

1. Raise the rear of the vehicle, and make sure it is securely supported, then remove the rear wheel.

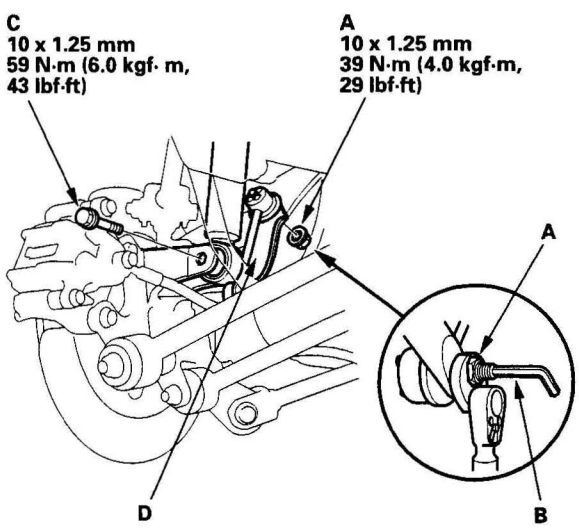
2. Remove the cotter pin from the upper ball joint castle nut, and remove the nut.



3. Separate the upper ball joint from the knuckle using the special tool (see page 18-9).

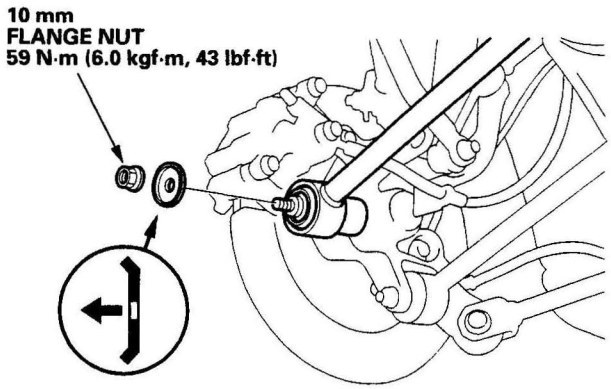
4. Remove the ABS sensor from the brake backing plate (see page 19-106).

5. Remove the flange nut (A) from the stabilizer link while holding the stabilizer link stud with a hex wrench (B).

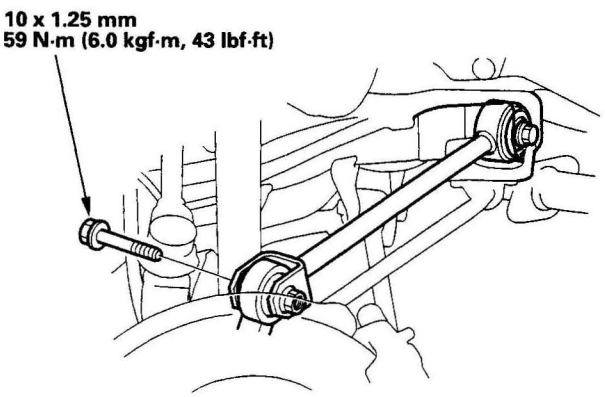


6. Remove the damper lower mounting bolt (C), and the stabilizer link mounting bracket (D).

7. Remove the control arm mounting nut from the rear knuckle.



8. Remove the leading arm mounting bolt from the rear knuckle.

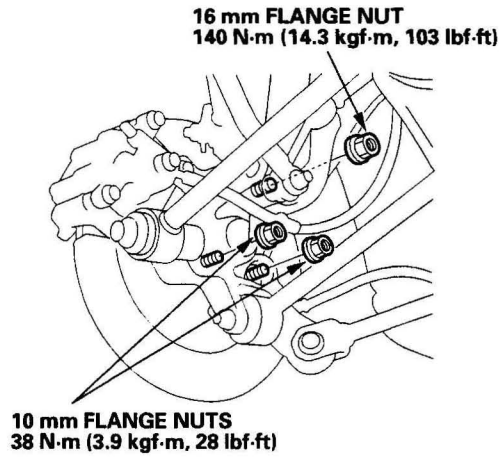


(cont'd)

Protected by AR

Parking Brake Cable Replacement (cont'd)

9. Remove the backing plate mounting nuts.



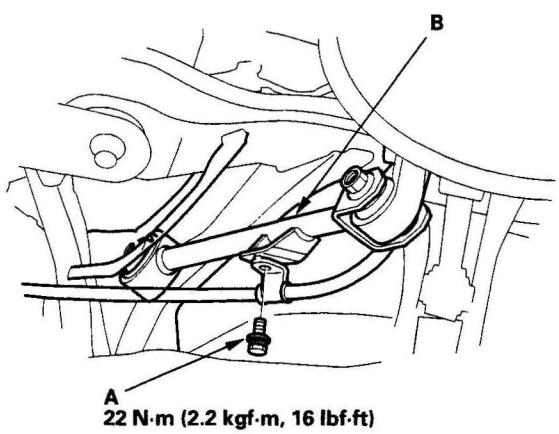
10. Remove the rear brake caliper, the caliper mounting bracket, and the brake hose mounting bolt from the rear knuckle (see step 3 on page 18-23).

11. Remove the rear brake disc and hub (see step 8 on page 18-23).

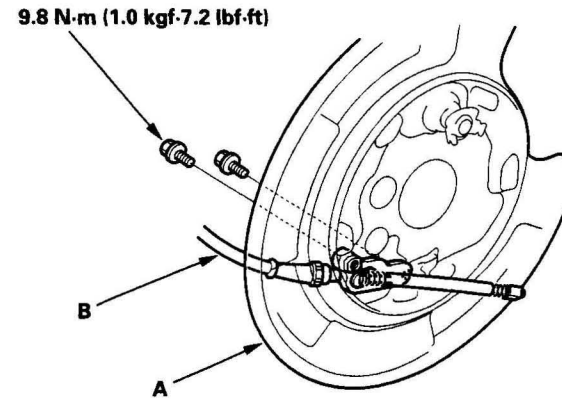
12. Remove the parking brake shoes from the backing plate (see page 19-26).

13. Remove the backing plate from the rear knuckle.

14. Remove the parking brake cable mounting bolt (A) from the trailing arm (B).



15. Remove the parking brake cable mounting bolts from the backing plate (A), and remove the cable (B).



16. Reinstall the parking brake cable in the reverse order of removal, and note these items:

- Be careful not to damage the joint boot when connecting the upper arm to the knuckle.
- Tighten the castle nut to the lower torque specifications, then tighten it only far enough to align the slot with the hole in the stud. Do not align the castle nut by loosening it.
- Tighten all mounting hardware to the specified torque values.
- Use a new cotter pin in the castle nut.
- Before installing the wheel, clean the mating surfaces on the brake disc and inside of the wheel.
- Adjust the parking brake (see page 19-6).
- Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

BACK

Protected by AR

Brakes

Conventional Brake Components 19-1

ABS/TCS (Anti-lock Brake System/Traction Control System) Components
Component Location Index 19-36
General Troubleshooting Information 19-37
DTC Troubleshooting Index 19-42
Symptom Troubleshooting Index 19-43
System Description 19-44
Circuit Diagram 19-58
DTC Troubleshooting 19-62
ABS Indicator Circuit Troubleshooting 19-99
TCS Indicator Circuit Troubleshooting 19-101
Modulator Unit Removal and Installation 19-103
TCS Switch Test 19-104
ABS/TCS Control Unit Replacement 19-105
Wheel Sensor Inspection 19-105
Wheel Sensor Replacement 19-106

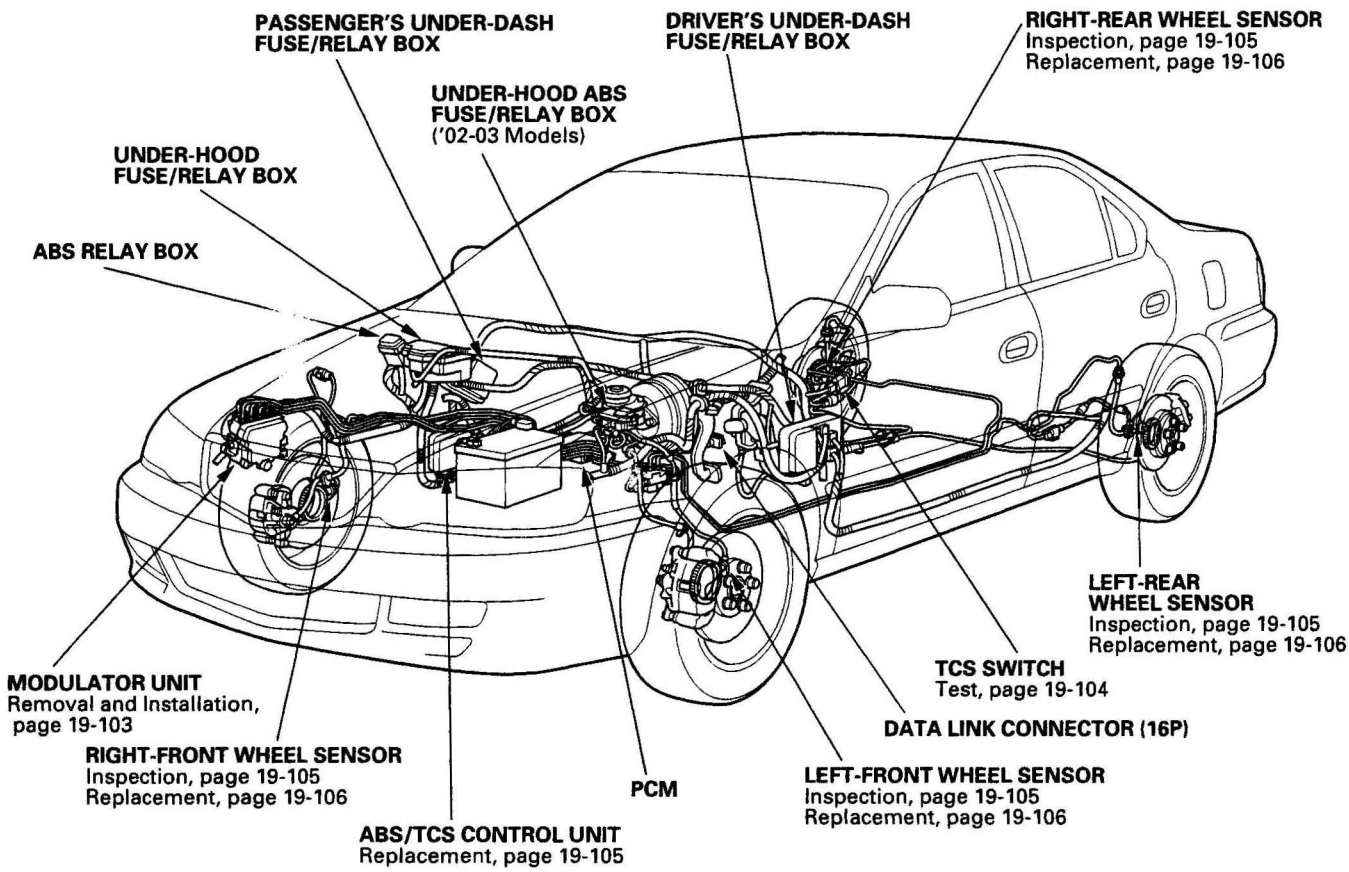
VSA (Vehicle Stability Assist) System Components 19-107



Protected by AR

ABS/TCS Components

Component Location Index



BACK

Protected by AR

General Troubleshooting Information

ABS/TCS Indicators

- If the system is OK, the ABS indicator goes off once after turning the ignition switch ON(II) without starting the engine, and then comes on again and goes off several seconds later after starting the engine. This occurs because the ABS/TCS control unit is turned on by the IG2 power source.
- The TCS or ABS indicator comes on when the TCS control unit detects a problem in the system.

However, even though the system is operating properly, the TCS or ABS indicator will come on, under the following conditions:

- **For ABS or TCS Indicator:**
  - Only drive wheels rotate
  - One drive wheel is stuck
  - The vehicle goes into a spin.
  - The ABS continues to operate for a long time.
  - The vehicle is subjected to an electrical signal disturbance.
- **For TCS Indicator:**
  - The TCS operated when the front brake pad temperature was excessively high.
  - The TCS switch is OFF.
  - One or more of these components are faulty: Heated oxygen sensor, Manifold absolute pressure sensor, Crankshaft position sensor, Engine coolant temperature sensor, Throttle position sensor, Top dead center sensor, Top dead center sensor 2, Intake air temperature sensor, Exhaust gas recirculation, Barometric pressure sensor, Idle air control valve, VTEC pressure switch, Knock sensor, Fuel supply system, Automatic transaxle, Misfire detection system of the PGM-FI system.

To determine the actual cause of problem, question the customer about the problem, taking these conditions into consideration:

- When a problem is detected and the ABS or TCS indicator comes on, there are cases when the indicator stays on until the ignition switch is turned OFF, and cases when the indicator goes off automatically when the system returns to normal. For ABS DTCs 61 and 62, the indicator goes off automatically when the system returns to normal. For all other codes, the indicator stays on until the ignition switch is turned OFF.
- For ABS DTCs 12, 14, 16, 18, 21, 22, 23, 24, 51, 52 and 53, the ABS indicator goes off when the vehicle is driven again and the system is OK after the ignition switch is turned from OFF to ON (II). However, if the DTC is cleared, the CPU resets and the indicator goes off right after the engine is started if the system is OK.
- The ABS is not operational when the ABS indicator is ON; the TCS is not operational when the TCS indicator is ON.
- When the ABS and TCS indicators are both ON, troubleshoot the ABS first.
- When the TCS indicator and MIL are both ON, troubleshoot the PGM-FI system first.

Diagnostic Trouble Code (DTC)

- The memory can hold any number of DTCs. However, when the same DTC is detected more than once, the more recent DTC is written over the earlier one . Therefore, when the same problem is detected repeatedly. It is memorized as a single DTC.
- The DTCs are indicated in ascending number order, not in the order that they occur.
- The DTCs are memorized in the EEPROM (non-volatile memory). Therefore, the memorized DTCs cannot be canceled by disconnecting the battery. Perform the specified procedures to clear the DTCs.

Self-diagnosis

- Self-diagnosis can be classified into 2 categories:
  - Initial diagnosis: Performed right after the engine starts and until the ABS or TCS indicator goes off.
  - Regular diagnosis: Performed right after the initial diagnosis until the ignition switch is turned OFF.
- When a problem is detected by self-diagnosis, the ABS/TCS control unit shifts to fail-safe mode.

Kickback

The pump motor operates when the ABS is functioning, and the fluid in the reservoir is forced out to the master cylinder, causing kickback at the brake pedal.

Pump Motor

- The pump motor operates when the ABS is functioning.
- The ABS/TCS control unit checks the pump motor operation during initial diagnosis when the vehicle is started. You may hear the motor operate at this time, but it is normal.

Brake Fluid Replacement/Air Bleeding

Brake fluid replacement and air bleeding procedures are identical to the procedures used on vehicles not equipped with ABS/TCS. To ease bleeding, start with the front wheels.

(cont'd)

Protected by AR

General Troubleshooting Information (cont'd)

How to Troubleshoot ABS and TCS DTCs

The troubleshooting procedures assume that the cause of the problem is still present and the ABS and/or TCS indicator is still on. Following the procedure when the ABS and/or TCS indicator does not come on can result in incorrect diagnosis.
The connector illustrations show the female terminal connectors with a single outline and the male terminal connectors with a double outline.

1. Question the customer about the conditions when the problem occured, and try to reproduce the same conditions for troubleshooting. Find out when the ABS and/or TCS indicator came on, such as during ABS control, after ABS control, when vehicle speed was at a certain speed, etc.

2. When the ABS or TCS indicator does not come on during the test drive, but troubleshooting is performed based on the DTC, check for loose connectors, poor contact of the terminals, etc. before you start troubleshooting.

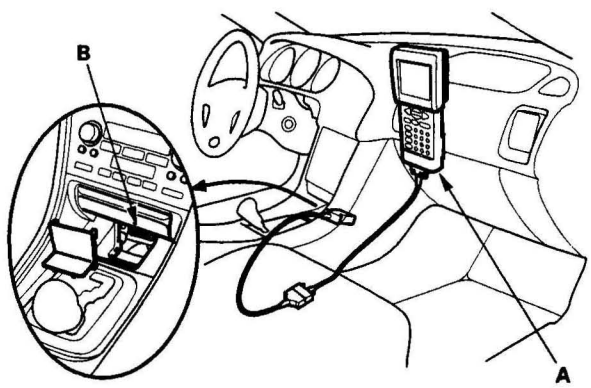
3. After troubleshooting, clear the DTCs and test-drive the vehicle. Be sure the ABS and TCS indicators do not come on.

How to Retrieve ABS or TCS DTCs

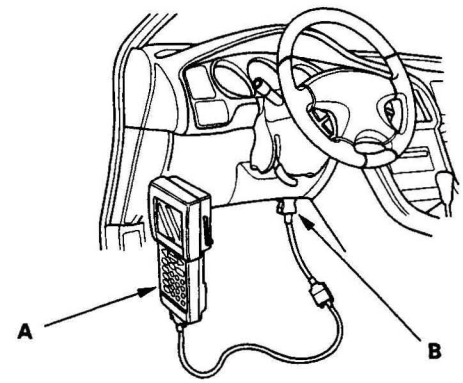
Honda PGM Tester Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind the driver's dashboard lower cover ('03 model).

'99-02 models:



'03 model:



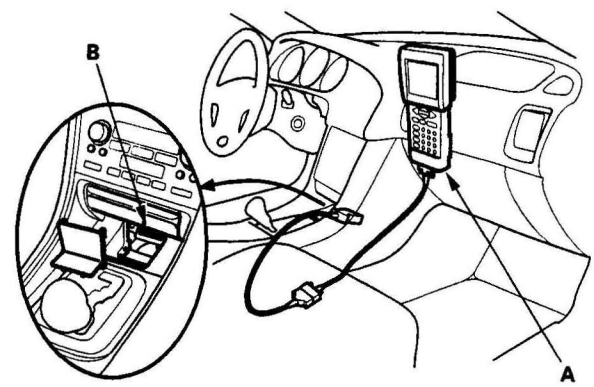
2. Turn the ignition switch ON (II), and follow the prompts on the Honda PGM Tester to display the DTC(s) on the screen. After determining the DTC, refer to the DTC Troubleshooting Index.

   NOTE: See the Honda PGM Tester user's manual for specific instructions.

Service Check Signal Circuit Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind the driver's dashboard lower cover ('03 model).

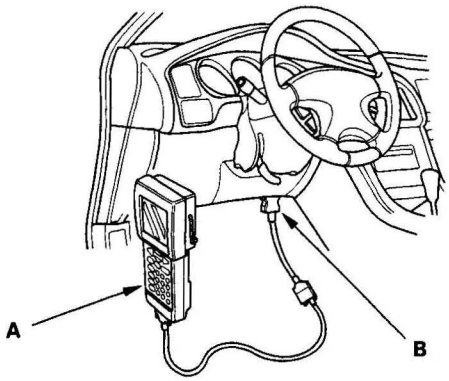
'99-02 models:



BACK

Protected by AR

'03 model:

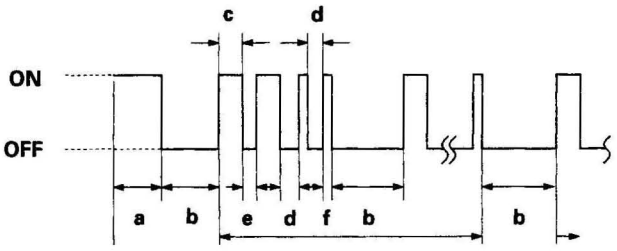


2. Short the SCS circuit to body ground using the Honda PGM Tester.
3. Turn the ignition switch ON (II) without pressing the brake pedal.

   NOTE: If the brake pedal is pressed when turning the ignition switch ON (II), the system shifts to the DTC clearing mode.
4. The blinking frequency indicates the DTC. (see the example)

   NOTE: If the DTC is not memorized, the ABS or TCS indicator will go off for 3.6 seconds, and then come back on.

   The system will not indicate the DTC unless these conditions are met:
   - The TCS switch is not pushed.
   - The brake pedal is not pressed.
   - The ignition switch is turned ON (II).
   - The engine is stopped.
   - The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).



a: 2 sec. **d: 0.4 sec.**
b: 3.6 sec. **e: 0.5 sec.**
c: 1.3 sec. **f : 0.3 sec.**

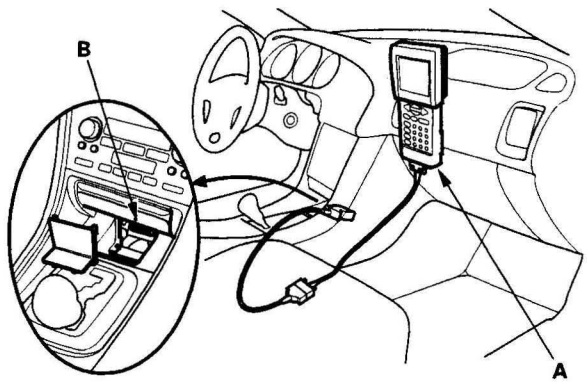
5. Turn the ignition switch OFF.
6. Disconnect the Honda PGM Tester from the DLC.

How to Clear ABS DTCs

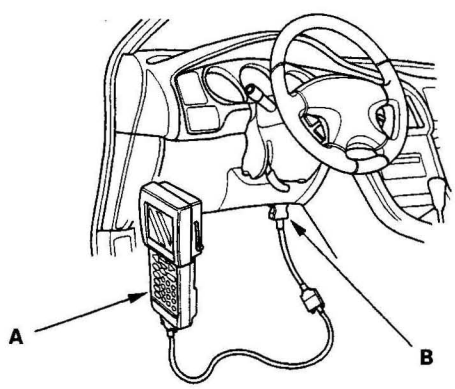
Honda PGM Tester Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind the driver's dashboard lower cover ('03 model).

'99-02 models:



'03 model:



2. Turn the ignition switch ON (II), and clear the DTC(s) by following the screen prompts on the Honda PGM Tester.

   NOTE: See the Honda PGM Tester user's manual for specific instructions.

(cont'd)

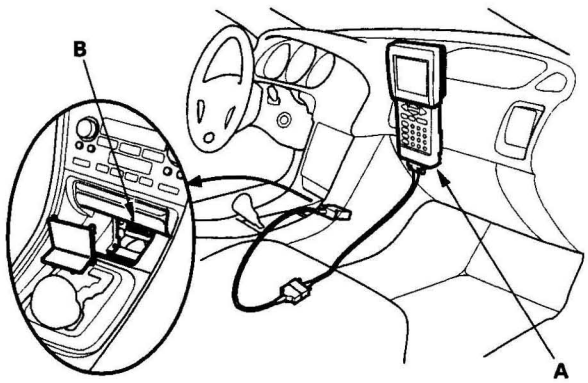
Protected by AR

General Troubleshooting Information (cont'd)

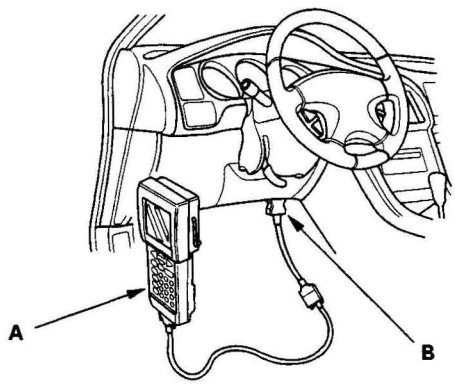
Service Check Signal Circuit Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind the driver's dashboard lower cover ('03 model).

'99-02 models:



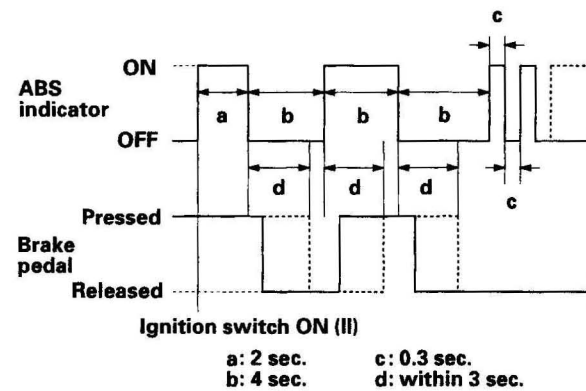
'03 model:



2. Short the SCS circuit to body ground using the Honda PGM tester.
3. Press the brake pedal.
4. Turn the ignition switch ON (II) while keeping the brake pedal pressed.
5. After the ABS indicator goes off, release the brake pedal.
6. After the ABS indicator comes on, press the brake pedal again.
7. After the ABS indicator goes off, release the brake pedal again.

You cannot clear the DTC unless these conditions are met:

- The vehicle is stopped or the front wheels are turning no faster than 6 mph (10 km/h).
- The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).
- The brake pedal is pressed before the ignition switch is turned ON (II).



8. After a few seconds, the ABS indicator blinks twice and the DTC is cleared. If the indicator does not blink twice, repeat steps 1 through 7. If the indicator stays on after the indicator blinks twice, check the DTC because a problem was detected during initial diagnosis before shifting to DTC clearing mode.
9. Turn the ignition switch OFF.
10. Disconnect the Honda PGM Tester from the DLC.

BACK

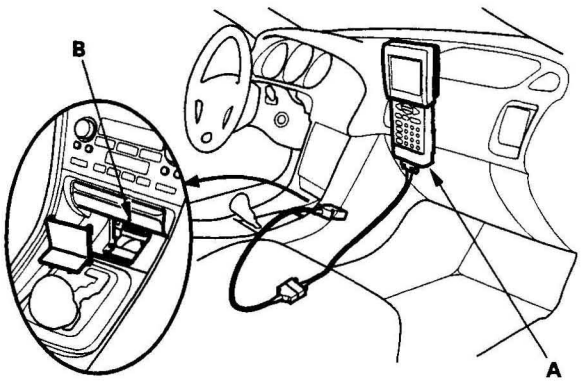
Protected by AR

How to Clear TCS DTCs

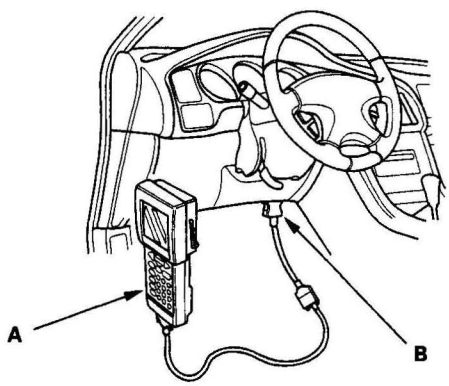
Honda PGM Tester Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind the driver's dashboard lower cover ('03 model).

'99-02 models:



'03 model:

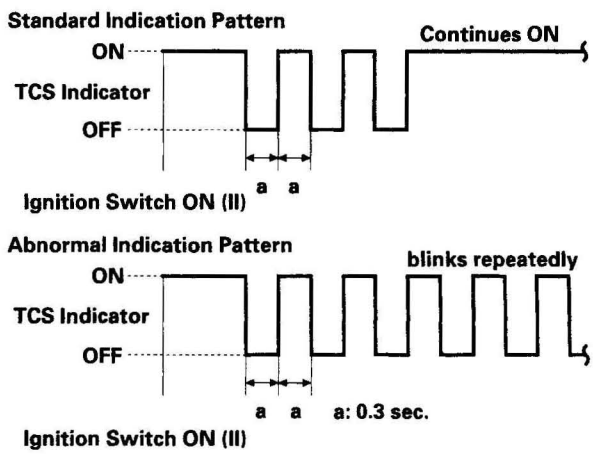


2. Turn the ignition switch ON (II), and clear the DTC(s) by following the screen prompts on the Honda PGM Tester.

NOTE: See the Honda PGM Tester user's manual for specific instructions.

SCS Circuit Method:

1. Press the parking brake pedal with the SCS circuit open. Keep the pedal pressed during the entire DTC clearing procedure.
2. Press and hold the TCS switch, then turn the ignition switch ON (II) without starting the engine.
3. Continue to hold the TCS switch for 4 seconds, then turn the ignition switch OFF.
4. Within 6 seconds, turn the ignition switch back ON (II) for at least 4 seconds, then release the TCS switch, and watch the TCS indicator.
5. After a few seconds, the TCS indicator will come on after blinking to indicate that the DTC is cleared. If the indicator blinks repeatedly, repeat steps 1 through 4.
6. Turn the ignition switch OFF.



Protected by AR

DTC Troubleshooting Index

ABS DTCs

DTC	Detection Item	Note
11	Right-front wheel sensor (open/short to body ground/short to power)	(see page 19-62)
12	Right-front wheel sensor (electrical noise/intermittent interruption)	(see page 19-63)
13	Left-front wheel sensor (open/short to body ground/short to power)	(see page 19-62)
14	Left-front wheel sensor (electrical noise/intermittent interruption)	(see page 19-63)
15	Right-rear wheel sensor (open/short to body ground/short to power)	(see page 19-62)
16	Right-rear wheel sensor (electrical noise/intermittent interruption)	(see page 19-63)
17	Left-rear wheel sensor (open/short to body ground/short to power)	(see page 19-62)
18	Left-rear wheel sensor (electrical noise/intermittent interruption)	(see page 19-63)
21	Right-front pulser	(see page 19-64)
22	Left-front pulser	(see page 19-64)
23	Right-rear pulser	(see page 19-64)
24	Left-rear pulser	(see page 19-64)
31	Right-front inlet solenoid	(see page 19-65)
32	Right-front outlet solenoid	(see page 19-65)
33	Left-front inlet solenoid	(see page 19-65)
34	Left-front outlet solenoid	(see page 19-65)
35	Right-rear inlet solenoid	(see page 19-65)
36	Right-rear outlet solenoid	(see page 19-65)
37	Left-rear inlet solenoid	(see page 19-65)
38	Left-rear outlet solenoid	(see page 19-65)
41	Right-front wheel lock	(see page 19-68)
42	Left-front wheel lock	(see page 19-68)
43	Right-rear wheel lock	(see page 19-68)
44	Left-rear wheel lock	(see page 19-68)
51	Motor lock	(see page 19-69)
52	Motor stuck OFF	(see page 19-69)
53	Motor stuck ON	(see page 19-74)
54	ABS Fail-safe relay	(see page 19-78)
61	Low ignition voltage	(see page 19-81)
62	High ignition voltage	(see page 19-81)
71	Different diameter tire	(see page 19-82)
81	Central Processing Unit (CPU) diagnosis, and ROM/RAM diagnosis	(see page 19-82)

TCS DTCs

DTC	Detection Item	Note
24	RF TCS NO solenoid	(see page 19-83)
25	RF TCS NC solenoid	(see page 19-83)
26	LF TCS NO solenoid	(see page 19-83)
27	LF TCS NC solenoid	(see page 19-83)
28	TCS relay	(see page 19-86)
31	Engine retard command (PFINH) signal	(see page 19-89)
32	Engine speed (NEP) signal	(see page 19-91)
34	Reference voltage (VREF) signal	(see page 19-93)
36	Throttle position sensor output (THLOUT) signal	(see page 19-94)
61	A/T shift position (ATSFTP) signal	(see page 19-96)
81	Continuous TCS operation	(see page 19-98)

BACK

Protected by AR

Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
ABS indicator does not come on	ABS indicator Circuit Troubleshooting (see page 19-99)	
ABS indicator does not go off and no DTC is stored	ABS Indicator Circuit Troubleshooting (see page 19-99)	
ABS indicator came on once, but it is OK now	The vehicle is OK at this time (see page 19-37)	
TCS indicator does not come on	TCS indicator Circuit Troubleshooting (see page 19-101)	
TCS indicator does not go off and no DTC is stored	TCS Indicator Circuit Troubleshooting (see page 19-101)	
TCS indicator came on once, but it is OK now	The vehicle is OK at this time (see page 19-37)	

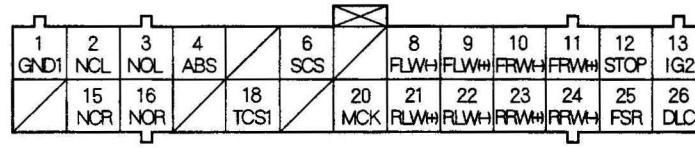
Protected by AR

ABS/TCS Components

System Description

ABS/TCS Control Unit Inputs and Outputs for Connector A (26P)

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement			
				Terminal	Conditions (Ignition switch ON (II))		Voltage
1	BLK	GND1 (Ground 1)	Ground	1-GND	———		Below 0.3 V
2	YEL/GRN	NCL (Normally closed left)	Drives left TCS normally closed solenoid valve	2-GND	TCS Indicator	OFF	Battery Voltage
3	GRY	NOL (Normally open left)	Drives left TCS normally open solenoid valve	3-GND		ON (Disconnect 16P connector to turn indicator on)	Below 0. 3V
4	BLU/WHT	ABS	Drives ABS indicator (Turns the indicator drive transistor to ON, then turns off the indicator)	4-GND	ABS indicator	OFF	4 – 6 V
						ON	Below 1.0 V
6	BRN	SCS (Service check signal)	Detects service check connector signal (Use for DTC indication)	6-GND	SCS Circuit	Shorted	Below 0.3 V
						Opened	About 5 V
8	BRN	FLW (–) (Front-left wheel negative)	Detects left-front wheel sensor signal	8-9	Wheel	Turn wheel at 1 turn/second	AC: 0. 053 V or above (Reference) Oscilloscope: 0.15 Vp-p or above
9	GRN/BLU	FLW (+) (Front-left wheel positive)					
10	GRN	FRW (–) (Front-right wheel negative)	Detects right-front wheel sensor signal	10-11			
11	GRN/BLK	FRW (+) (Front-right wheel positive)				Stopped	0.25 V– 1.15 V
12	WHT/BLK	STOP	Detects brake switch signal	12-GND	Brake pedal	Pressed	Battery Voltage
						Released	Below 0.3 V
13	YEL/BLK	IG2 (Ignition 2)	Power source for activating the system	13-GND	Ignition switch	ON (II)	Battery Voltage
						Start (III)	Below 0.3 V

BACK

Protected by AR

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement			
				Terminal	Conditions (Ignition switch ON (II))		Voltage
15	RED/GRN	NCR (Normally closed right)	Drives right TCS normally closed solenoid valve	15-GND	TCS indicator	OFF	Battery Voltage
16	LT/BLU	NOR (Normally opened right)	Drives right TCS normally open solenoid valve	16-GND		ON (Disconnect 16P connector to turn indicator on)	Below 0.3 V
18	RED/WHT	TCS1	Drives TCS indicator (Turns the indicator drive transistor to ON, then turns off the indicator)	18-GND	TCS indicator	Engine running	Battery Voltage
						ON	About 2 V
20	GRN	MCK (Motor check)	Detects pump motor drive signal	20-GND	Pump motor	ON	Battery Voltage
						OFF	Below 0.3 V
					Remove MCK fuse		About 10 V
21	LT BLU	RLW (+) (Rear-left wheel positive)	Detects left-rear wheel sensor signal	21-22	Wheel	Turn wheel at 1 turn/second	AC: 0. 053V or above (Reference) Oscilloscope: 0.15 Vp-p or above
22	GRY	RLW (−) (Rear-left wheel positive)					
23	GRN/YEL	RRW (+) (Rear-right wheel positive)	Detects right-rear wheel sensor signal	23-24			
24	BLU/YEL	RRW (−) (Rear-right wheel negative)				Stopped	0.25 V− 1.15 V
25	YEL/GRN	FSR (Fail-safe relay)	Drives ABS fail-safe relay (ABS fail-safe relay is turned OFF to shut off the power source to the solenoid and pump motor relay when a problem occurs.)	25-GND	ABS (SCS circuit must be open)	Warning	Below 0.3 V
						Normal	About 11V
26	LT BLU	DLC (Data link connector)	Communicates with the Honda PGM Tester	———	———		———

(cont'd)

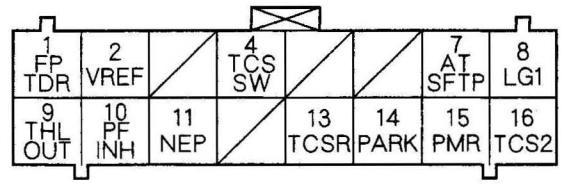
BACK

Protected by AR

System Description (cont'd)

ABS/TCS Control Unit Inputs and Outputs for Connector B (16P)

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

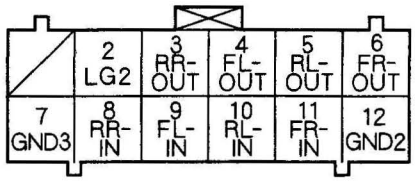
Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement			
				Terminal	Conditions (Ignition switch ON (II))		Voltage
1	PNK	FPTDR (Frame to powertrain torque down request)	Outputs engine retard request signal	1-GND	TCS	Not operating	About 2.5 V (5V, duty 50)
						Operating	About 5V
2	ORN/GRN	VREF (Voltage reference)	Reference voltage for the sensors of the PGM-FI system	2-GND			About 5V
4	ORN/WHT	TCS SW (TCS switch)	Detects TCS switch signal	4-GND	TCS switch	TCS switch pressed	Battery Voltage
						OFF (TCS indicator is ON)	0 V
7	LT GRN	ATSFTP (AT shift position)	Detects A/T shift position signal	7-GND	Shift the transmission to P position, then start the engine.		About 4 V
8	BRN/YEL	LG1 (Logic ground 1)	Ground for logic circuit	8-GND	—		Below 0.3 V
9	YEL/GRN	THLOUT (Throttle out)	Detects throttle position sensor signal	9-GND	Throttle valve	Fully closed	About 0.5V
						Fully opened	About 4.8V
10	BLU	PFINH (Powertrain to frame inhibition)	Detects TCS operation permission signal	10-GND	Permission (normal)		About 2.5V (5V, duty 50)
					Inhibition (the coolant temperature is 0°C or below)		About 5 V
					Failure (TCS and/or PCM has failed)		About 0 V
11	BLU	NEP (Engine speed pulse)	Detects engine speed signal	11-GND	Engine idling		About 6 V
13	GRN/YEL	TCSR (TCS relay)	Drives TCS relay (TCS relay is turned OFF to shut off the power source to the TCS solenoid and pump motor relay when a problem occurs)	13-GND	TCS (SCS circuit must be opened)	Warning	Below 0.3 V
						Normal	About 11 V
14	GRN/RED	PARK (Parking)	Detects parking brake switch signal	14-GND	With engine running, parking brake	Pressed	Below 0.3 V
						Released	Battery Voltage
15	YEL/RED	PMR (Pump motor relay)	Drives pump motor relay	15-GND	ABS indicator	OFF — Pump motor ON	Below 1.0 V
						OFF — Pump motor OFF	Battery Voltage
						ON	Below 0.3 V
16	RED/WHT	TCS2	Drives TCS indicator (Turns the indicator drive transistor to ON, then turns off the indicator)	16-GND	TCS indicator	OFF	Battery Voltage
						ON	About 2 V

BACK

Protected by AR

ABS/TCS Control Unit Inputs and Outputs for Connector C (12P)

ABS/TCS CONTROL UNIT CONNECTOR C (12P)



Wire side of female terminals

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement			
				Terminal	Conditions (Ignition switch ON (II))		Voltage
2	BRN/YEL	LG2 (Logic ground 2)	Ground for logic circuit	2-GND	——		Below 0.3 V
3	YEL/WHT	RR-OUT (Rear-right outlet)	Drives right-rear outlet solenoid valve	3-GND	ABS indicator	OFF	Battery Voltage
4	YEL/BLU	FL-OUT (Front-left outlet)	Drives left-front outlet solenoid valve	4-GND			
5	YEL/GRN	RL-OUT (Rear-left outlet)	Drives left-rear outlet solenoid valve	5-GND		ON (Disconnect 16P connector to turn indicator on)	Below 0.3 V
6	YEL/BLK	FR-OUT (Front-right outlet)	Drives right-front outlet solenoid valve	6-GND			
7	BLK	GND3 (Ground 3)	Ground	7-GND	——		Below 0.3 V
8	RED/WHT	RR-IN (Rear-right inlet)	Drives right-rear inlet solenoid valve	8-GND	ABS indicator	OFF	Battery Voltage
9	RED/BLU	FL-IN (Front-left inlet)	Drives left-front inlet solenoid valve	9-GND			
10	RED/GRN	RL-IN (Rear-left inlet)	Drives left-rear inlet solenoid valve	10-GND		ON (Disconnect 16P connector to turn indicator on)	Below 0.3 V
11	RED/BLK	FR-IN (Front-right inlet)	Drives right-front inlet solenoid valve	11-GND			
12	BLK	GND2 (Ground 2)	Ground	12-GND	——		Below 0.3 V

(cont'd)

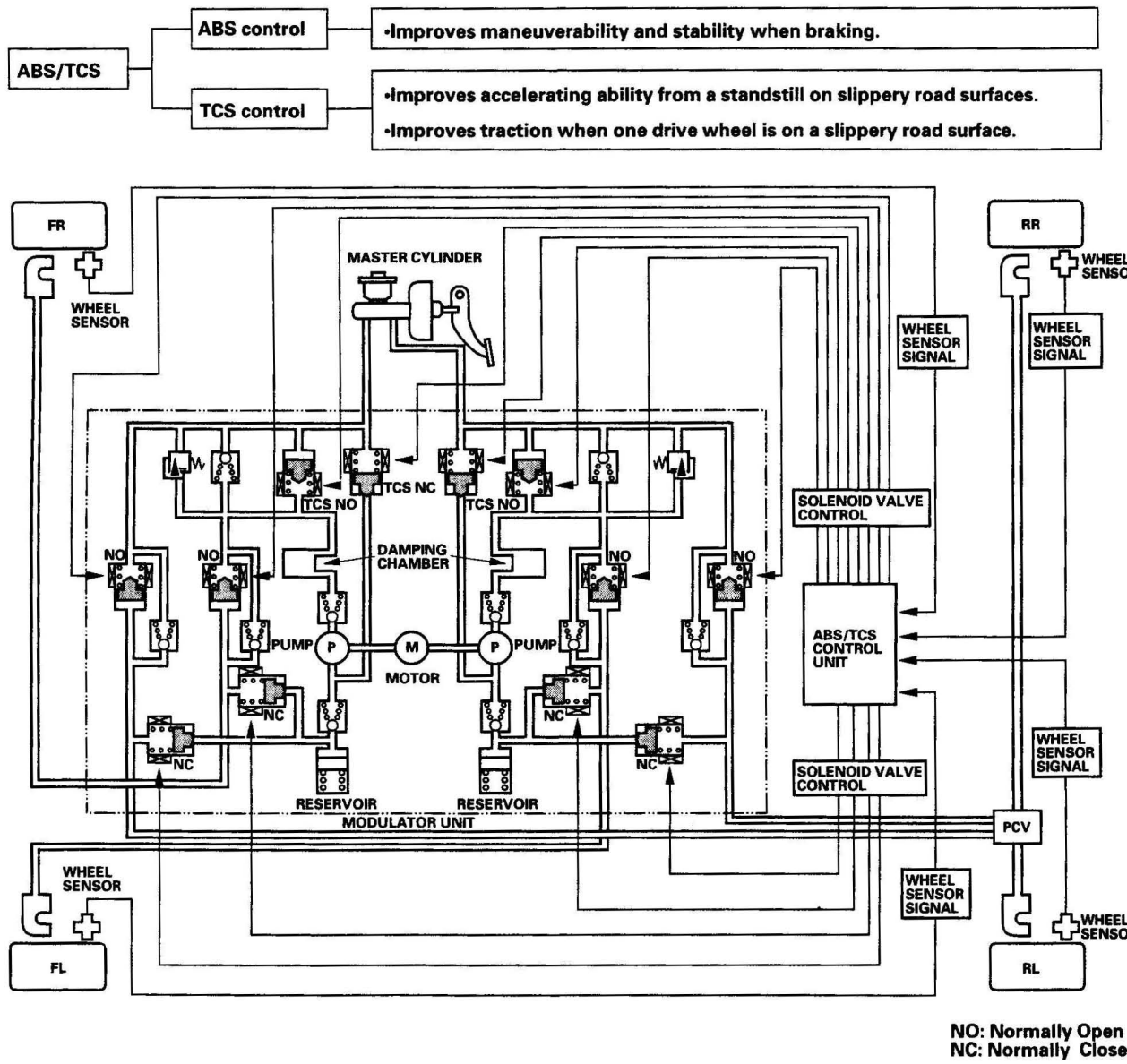
BACK

Protected by AR

System Description (cont'd)

Outline

This system consists of the ABS/TCS control unit, the modulator unit, four wheel sensors, and the PCM. The system integrates the ABS (Anti-lock Brake System) and the TCS (Traction Control System) and controls both systems using the brakes.



NO: Normally Open
NC: Normally Closed

BACK

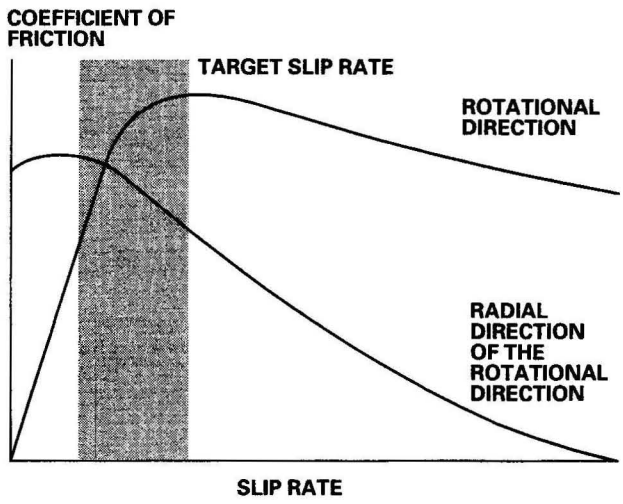
Protected by AR

ABS Features

When the brake pedal is pressed while driving, the wheels can lock before the vehicle comes to a stop. In such an event, the maneuverability of the vehicle is reduced if the front wheels are locked, and the stability of the vehicle is reduced if the rear wheels are locked, creating an extremely unstable condition. The ABS precisely controls the slip rate of the wheels to ensure maximum grip force from the tires, and it thereby ensures maneuverability and stability of the vehicle.

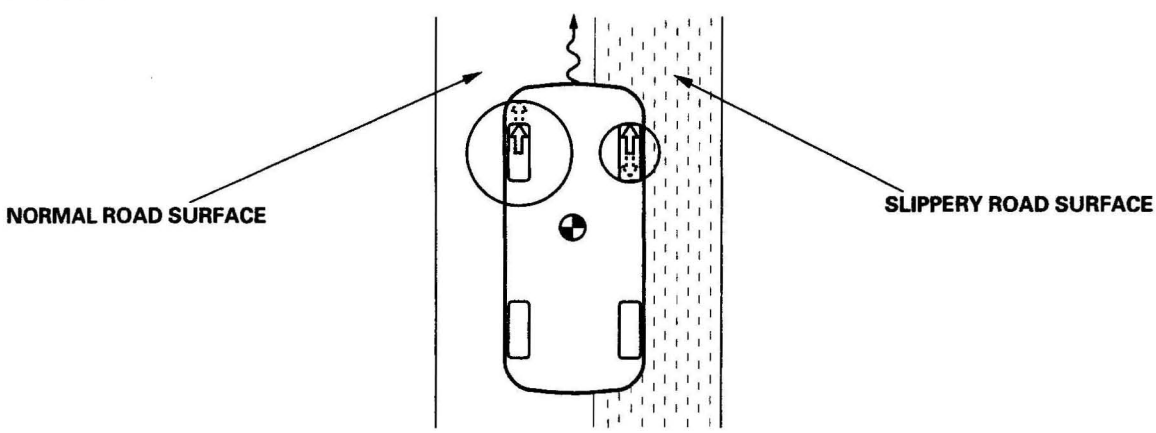
The ABS calculates the slip rate of the wheels based on the vehicle speed and the wheel speed, then it controls the brake fluid pressure to reach the target slip rate.

Grip Force of Tire and Road Surface



TCS Features

The TCS provides low speed traction. When a drive wheel loses traction on a slippery road surface and starts to spin, the ABS/TCS control unit sends a brake signal to the modulator unit, which applies brake pressure to slow the spinning wheel. At that time, the ABS/TCS control unit sends an engine retard signal to the PCM to prevent damage to the transmission.



(cont'd)

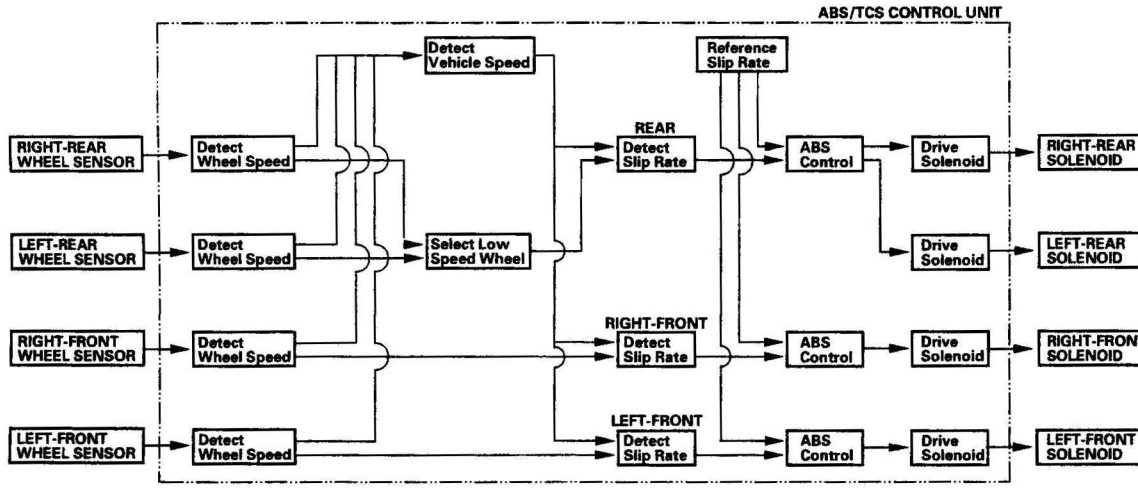
BACK

Protected by AR

System Description (cont'd)

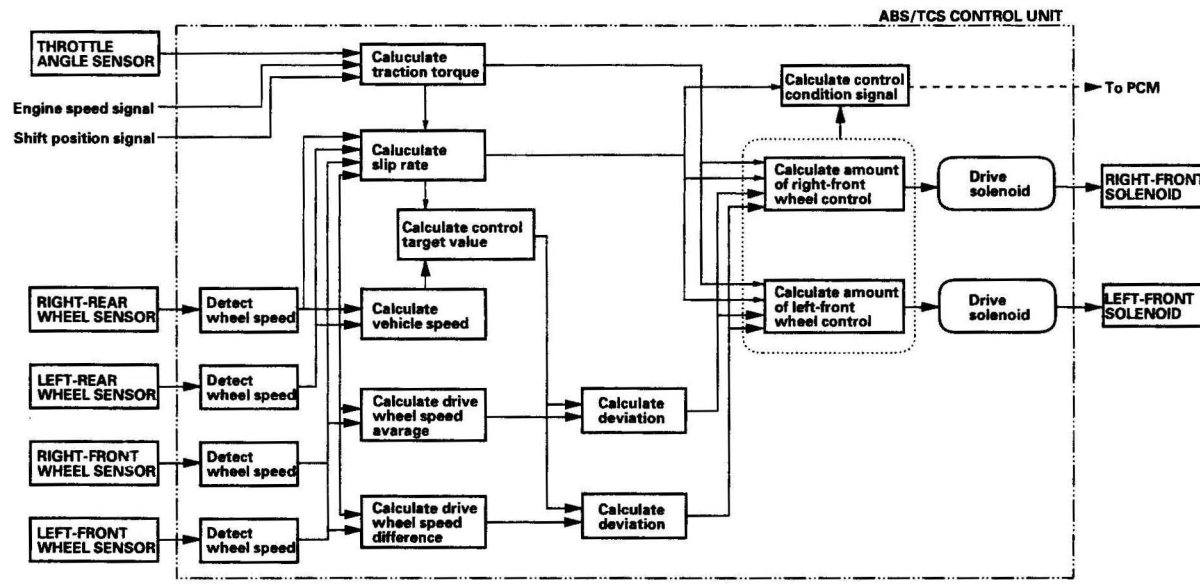
ABS Main Control

The ABS/TCS control unit detects the wheel speed based on the wheel sensor signal it received, then it calculates the vehicle speed based on the detected wheel speed. The control unit detects the vehicle speed during deceleration based on the rate of deceleration.
The ABS/TCS control unit calculates the slip rate of each wheel, and it transmits the control signal to the modulator unit solenoid valve when the slip rate is high.
The pressure reduction control has three modes: pressure intensifying, pressure retaining, and pressure reducing.



TCS Main Control

The ABS/TCS control unit controls the TCS based on signal inputs from the throttle position sensor, engine speed sensor, shift position sensor, and the wheel sensors. In addition, the ABS/TCS control unit sends an engine retard request signal to the PCM if necessary. The ABS/TCS control unit uses the modulator unit to control the TCS. The pressure intensifying control has three modes: pressure intensifying, pressure retaining, and pressure reducing.



BACK

Protected by AR

ABS Self-Diagnosis

- The ABS/TCS control unit is equipped with a main CPU and a sub CPU. Each CPU checks the other for problems.
- The CPUs check the circuit of the system.
- Self-diagnosis can be classified into 2 categories:
  - Initial diagnosis: Done right after the engine starts and until the ABS or TCS indicator goes off.
  - Regular diagnosis: Done right after the initial diagnosis until the ignition switch is turned OFF.
- When a problem is detected by self-diagnosis, the ABS/TCS control unit shifts to fail-safe mode.

ABS Self-diagnosis Table

Diagnostic Trouble Code (DTC)	Detection Item	Detection Timing		Fail-safe Mode
		Initial Diagnosis	Regular Diagnosis	
11, 13, 15, 17	Wheel sensor (open/short to body ground/short to power)	○	○	A0
12, 14, 16, 18	Wheel sensor (electrical noise/intermittent interruption)		○	A0, L0
21-24	Pulser		○	A0, L0
31-38	Solenoid (short to body ground/short to wire)	○	○	S1
41-44	Wheel lock		○	A0, L0
51	Motor lock		○	A0, L0
52	Motor stuck OFF		○	A0, L0
53	Motor stuck ON	○	○	A0, L0
54	Fail-safe relay	○	○	S1
61	Low ignition voltage		○	B0
62	High ignition voltage		○	B0
71	Different diameter tire		○	S1
81	Central Processing Unit (CPU), ROM/RAM	○	○	S1

ABS Operation Mode Table

Operation Mode	Description	ABS Indicator	TCS Indicator
Regular operation	Operation in normal condition	OFF	OFF
Fail-safe mode-S1	The ABS/TCS control unit turns the system off (ABS fail-safe relay off) when the control unit detects a problem.	ON	ON
Fail-safe mode-A0	If the ABS/TCS control unit detects a malfunction while the ABS or TCS is operating, it will turn off the malfunctioning component, and continue to modulate the rest of the ABS system until completing the ABS or TCS operation. At that time, the entire system will be turned off until the problem goes away.	ON	ON
Fail-safe mode-L0	The ABS/TCS control unit stores a DTC in back-up memory when it detects a problem. If a problem is detected when the ignition switch is turned ON (II), the ABS/TCS control unit will turn the system off. If the problem goes away, the ABS/TCS control unit will turn the system on again.	ON	ON
Fail-safe mode-B0	The ABS/TCS control unit will turn the system off if ignition voltage drops, and will turn it on again when ignition voltage returns to normal.	ON	ON

On-board Diagnosis Function

The ABS can be diagnosed with the Honda PGM Tester.
The ALB Checker cannot be used with this system. For air bleeding, and checking wheel sensor signals, use the Honda PGM Tester. See the Honda PGM Tester User's manuals for specific operating instructions.

(cont'd)

BACK

Protected by AR

System Description (cont'd)

TCS Self-diagnosis

- The ABS/TCS control unit is equipped with a main CPU and a sub CPU. Each CPU checks the other for problems.
- The CPUs check the circuit of the system.
- Self-diagnosis can be classified into 2 categories:
  - Initial diagnosis: Done right after the engine starts and until the ABS or TCS indicator goes off.
  - Regular diagnosis: Done right after the initial diagnosis until the ignition switch is turned OFF.
- When a problem is detected by self-diagnosis, the ABS/TCS control unit shifts to fail-safe mode.

TCS Self-diagnosis Table

Diagnostic Trouble Code (DTC)	Detection Item	Detection Timing		Fail-safe Mode
		Initial Diagnosis	Regular Diagnosis	
24-27	TCS solonoid (short to body ground/short to wire)	○	○	S1
28	TCS relay	○		S1
31	Engine retard command (PFINH) signal (open/short to body ground)		○	A2
32	Engine speed(NEP)signal (open/short to body ground)		○	A2
34	Reference voltage(VREF) signal(open/short to body ground)	○	○	A2
36	Throttle position sensor output(THLOUT)signal(open/short to body ground)	○	○	A2
61	A/T shift position(ATSFTP) signal (open/short to body ground)		○	A2
81	Continuous TCS operation		○	A2

TCS Operation Mode Table

Operation Mode	Description	ABS Indicator	TCS Indicator
Regular operation	Operation in normal condition	OFF	OFF
Fail-safe mode-S1	The ABS/TCS control unit turns the system off (fail-safe relay off) when the control unit detects a problem.	ON	ON
Fail-safe mode-A2	If the ABS/TCS control unit detects a malfuction while the TCS is operating, it will turn off the malfunctioning component, and continue to modulate the rest of the TCS system until completing the TCS operation. At that time, the TCS system will be turned off.	OFF	ON
TCS deactivate mode	If the front brake pad temperature rises excessively, the ABS/TCS control unit stops the TCS system and it turns the TCS indicator on. When the brake pad temperature lowers, the ABS/TCS control unit turns off the TCS indicator and restarts the TCS system.	OFF	Comes ON when the front brake pad temperature rises excessively.
TCS OFF mode	The ABS/TCS control unit cancels the TCS system under these conditions: • If the ABS/TCS control unit detects a problem with the PGM-FI communication circuit. • The ABS system is faulty. • The TCS system is OFF. If these conditions return to normal, the ABS/TCS control unit restarts the TCS system.	ON or OFF (ON: When the ABS system is faulty)	ON

On-board Diagnosis Function

The TCS can be diagnosed with the Honda PGM Tester.
The ALB Checker cannot be used with this system. For air bleeding, and checking wheel sensor signals, use the Honda PGM Tester. See the Honda Tester User's manuals for specific operating instructions.

BACK

Protected by AR

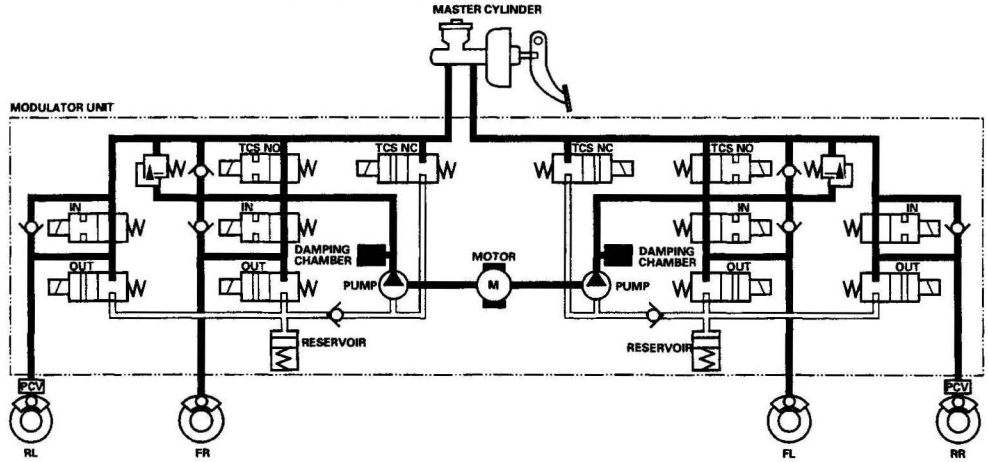
Modulator Unit

The modulator unit consists of the inlet solenoid valve, outlet solenoid valve, TCS normally open (NO) solenoid valve, TCS normally closed (NC) solenoid valve, reservoir, pump, pump motor, and the damping chamber.
The modulator controls the caliper fluid pressure directly. It is a circulating-type modulator because the brake fluid circulates through the caliper, the reservoir, and the master cylinder.
The hydraulic control has three modes: pressure intensifying, pressure retaining, and pressure reducing.
The hydraulic circuit is an independent four channel type, one channel for each wheel.

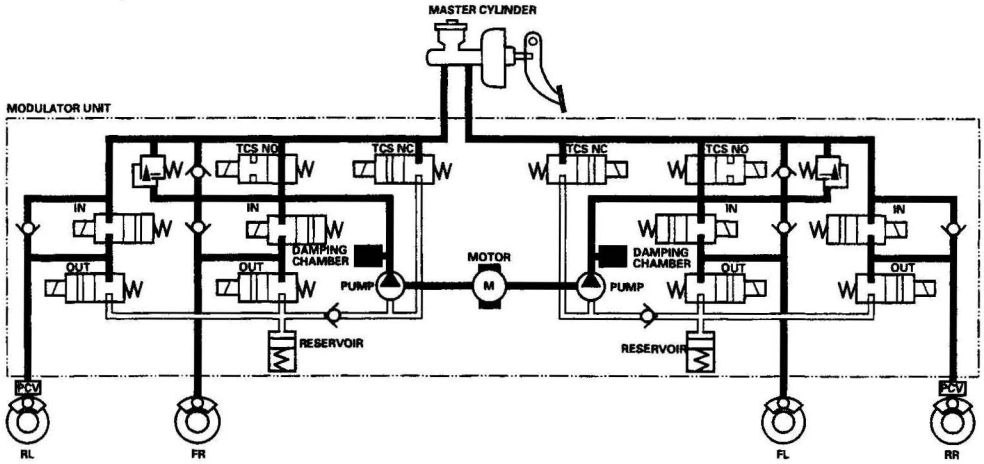
ABS Control

Pressure intensifying mode
TCS NO valve open, TCS NC valve closed, inlet valve open, outlet valve closed.
Master cylinder fluid is pumped out to the caliper.

Pump Motor
When starting the pressure reducing mode, the pump motor is ON. When stopping ABS operation, the pump motor is OFF.
The reservoir fluid is pumped out by the pump, though the damping chamber, to the master cylinder.



Pressure retaining mode
TCS NO valve open, TCS NC valve closed, inlet valve closed, outlet valve closed.
Caliper fluid is retained by the inlet valve and outlet valve.



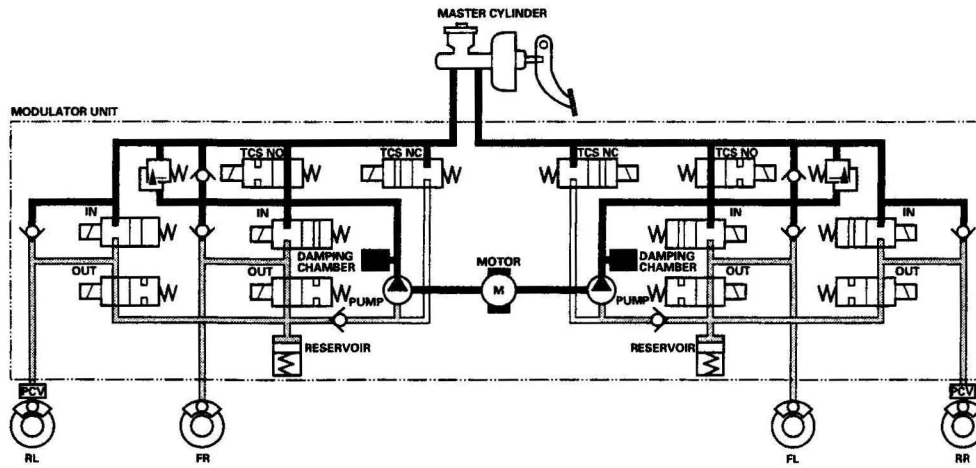
(cont'd)

BACK

Protected by AR

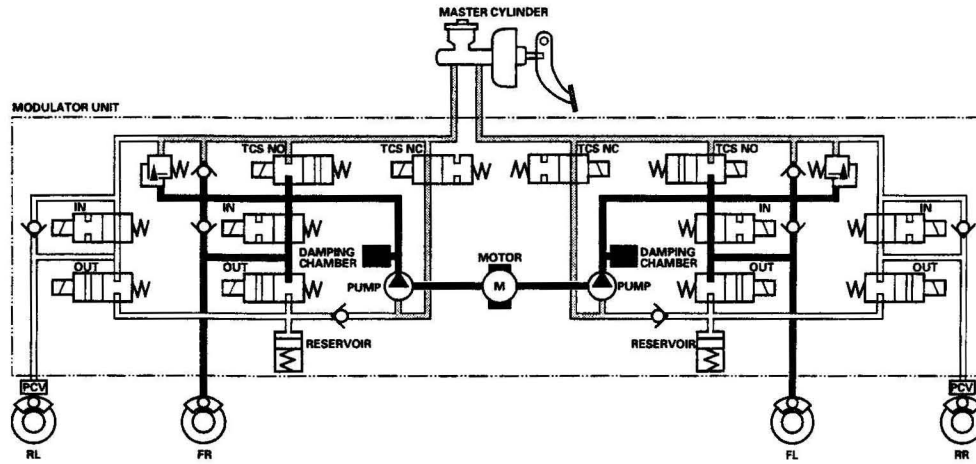
System Description (cont'd)

Pressure reducing mode
TCS NO valve open, TCS NC valve closed, inlet valve closed, outlet valve open.
Caliper fluid flows through the outlet valve to the reservoir.



TCS Control

Pressure intensifying mode
TCS NO valve closed, TCS NC valve open, inlet valve open, outlet valve closed, pump motor ON.
The reservoir and master cylinder fluid is pumped out by the pump, through the damping chamber, to the front caliper.

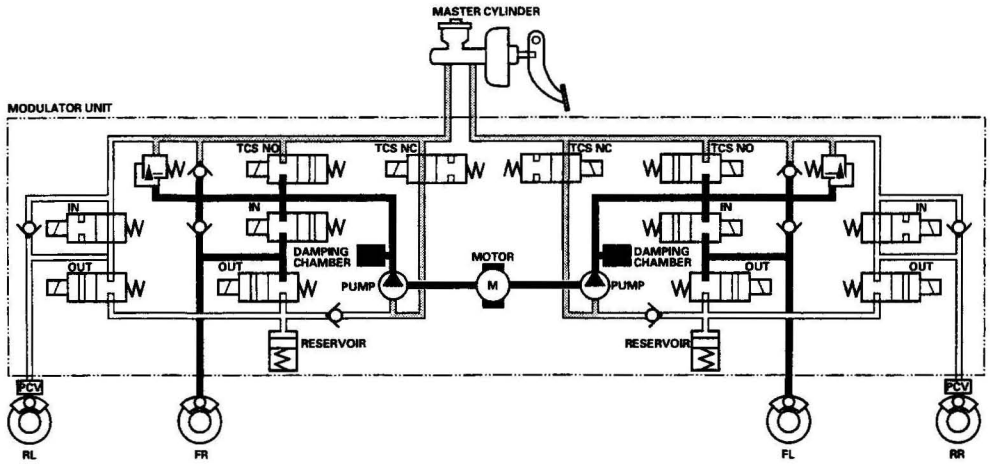


BACK

Protected by AR

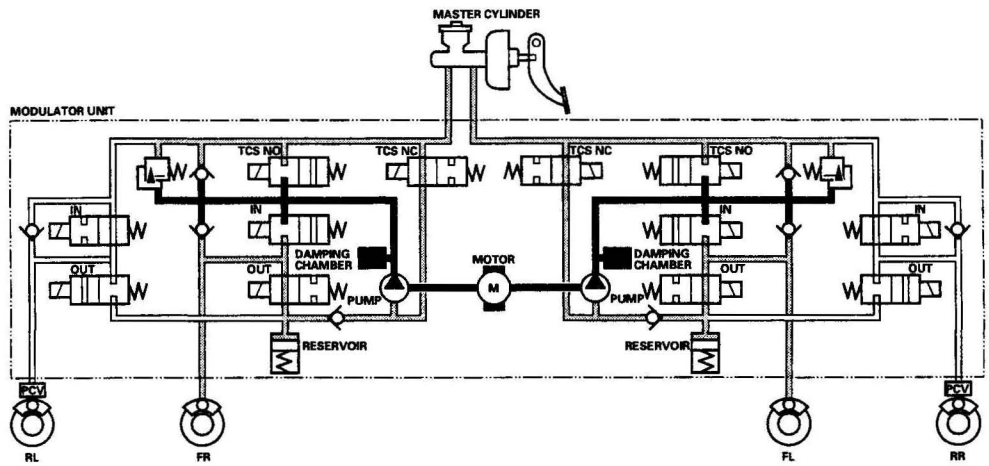
Pressure retaining mode

TCS NO valve open, TCS NC valve open, inlet valve closed, outlet valve closed, pump motor ON.
Front caliper fluid is retained by the inlet valve and outlet valve.



Pressure reducing mode

TCS NO valve closed, TCS NC valve open, front inlet valve closed, front outlet valve open, pump motor ON.
Caliper fluid flows through the outlet valve to the reservoir.



(cont'd)

BACK

Protected by AR

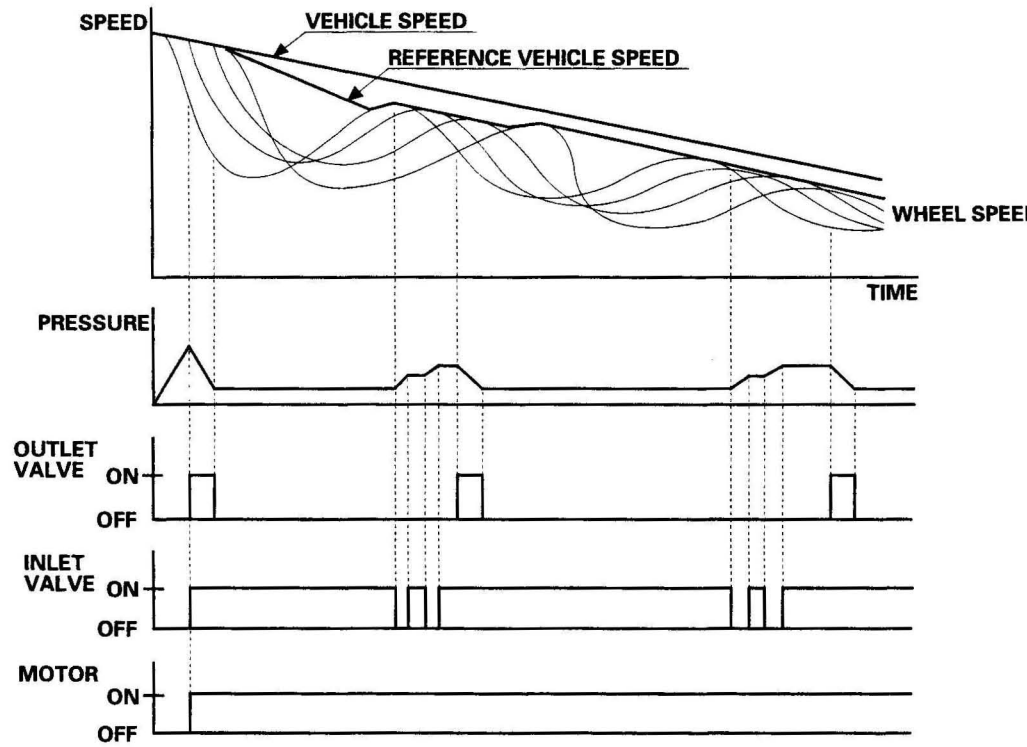
System Description (cont'd)

Wheel Sensor

The wheel sensors are the magnetic contactless type. As the gear pulser teeth rotate past the wheel sensor's magnetic coil, AC current is generated. The AC frequency changes in accordance with the wheel speed. The ABS/TCS control unit detects the wheel sensor signal frequency and thereby detects the wheel speed.



Wheel Speed and Modulator Control (ABS)

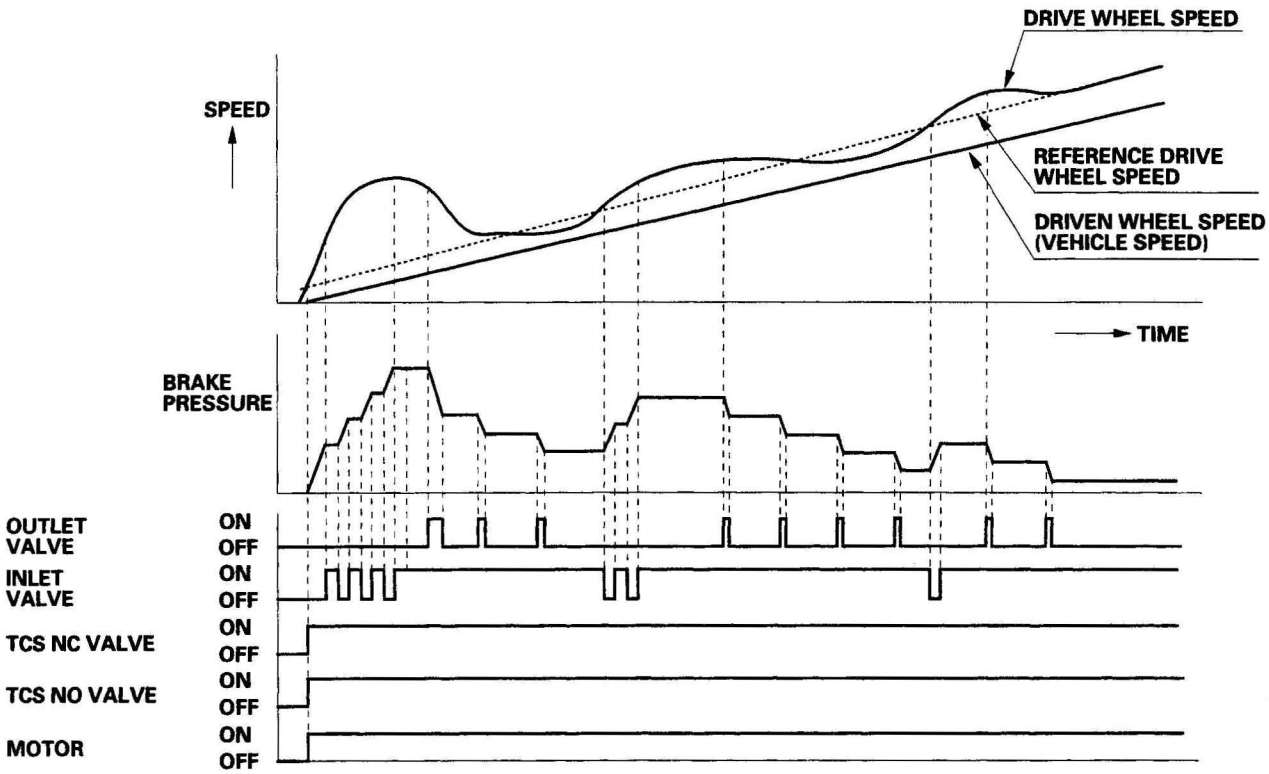


When the wheel speed drops sharply below the vehicle speed, the outlet valve opens momentarily to reduce the caliper fluid pressure. The pump motor starts at this time. As the wheel speed is restored, the inlet valve opens momentarily to increase the caliper fluid pressure.

BACK

Protected by AR

Wheel Speed and Modulator control (TCS)



When the front wheel speed rises sharply above the vehicle speed, the TCS NC valve opens, the TCS NO valve closes, and the pump motor starts to intensify the front caliper fluid pressure. When the wheel speed drops, the front inlet valve closes momentarity to ratain the front caliper fluid pressure. When the wheel speed drops further, the front outlet valve opens momentarity to reduce the front caliper fluid pressure.

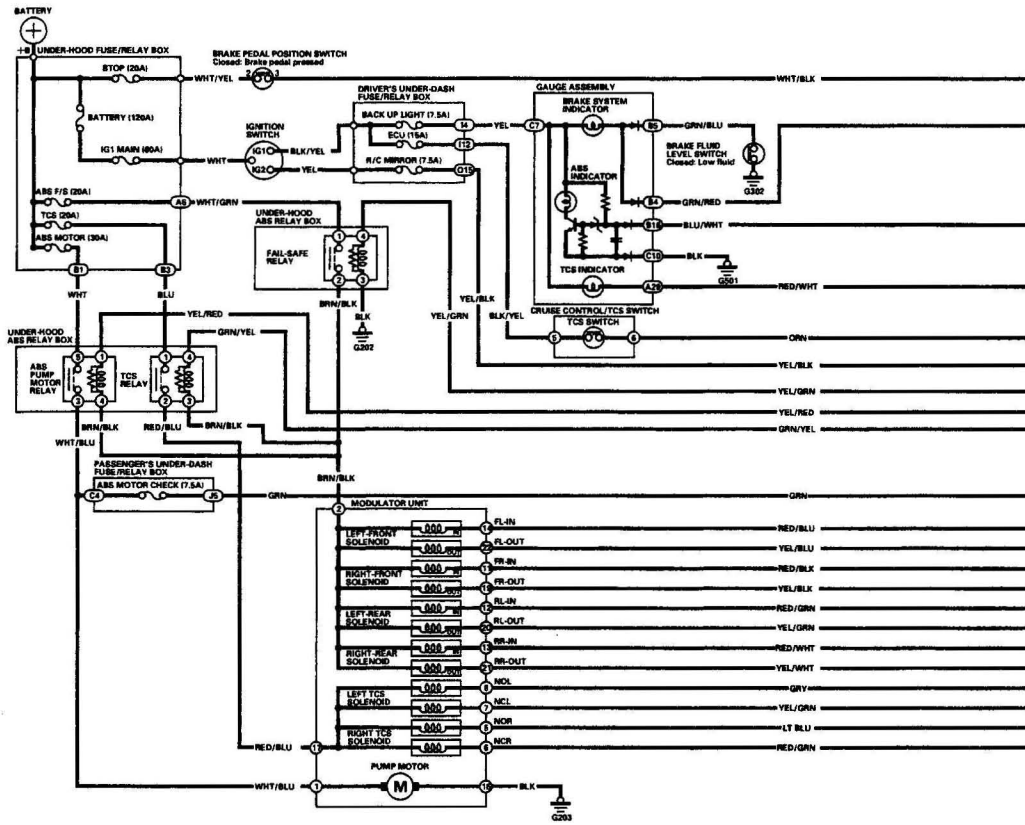
BACK

Protected by AR

ABS/TCS Components

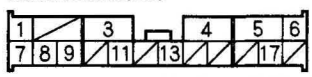
Circuit Diagram

'99-01 Models

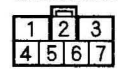


UNDER-HOOD FUSE/RELAY BOX CONNECTORS

CONNECTOR A (18P)



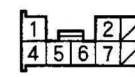
CONNECTOR A (18P)



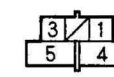
BRAKE SWITCH CONNECTOR



CRUISE CONTROL/ TCS SWITCH CONNECTOR

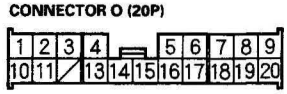


ABS PUMP MOTOR RELAY CONNECTOR

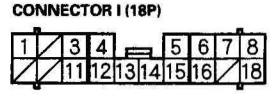


DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTORS

CONNECTOR O (20P)



CONNECTOR I (18P)

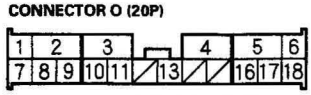


FAIL-SAFE RELAY/ TCS RELAY CONNECTOR

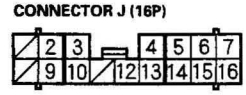


PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTORS

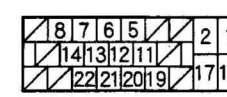
CONNECTOR O (20P)



CONNECTOR J (16P)



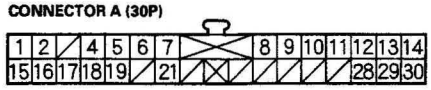
MODULATOR UNIT CONNECTOR



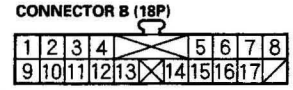
Terminal side of female terminals

GAUGE ASSEMBLY CONNECTORS

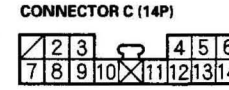
CONNECTOR A (30P)



CONNECTOR B (18P)



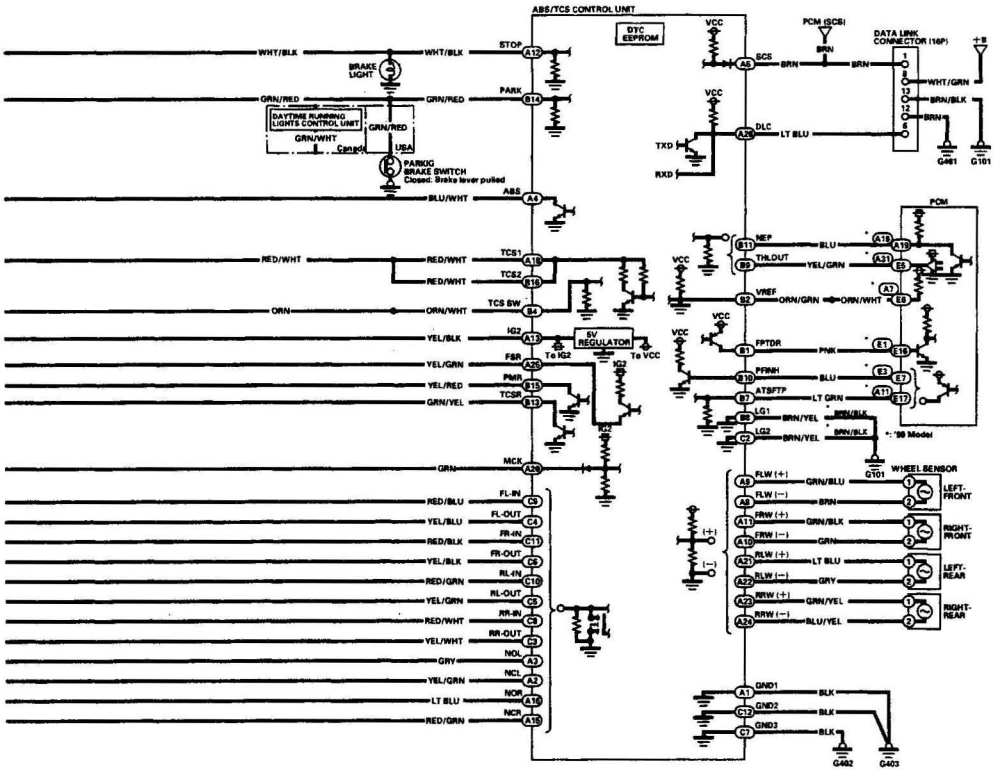
CONNECTOR C (14P)



Wire side of female terminals

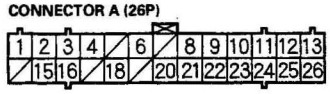
BACK

Protected by AR

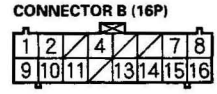


ABS/TCS CONTROL UNIT CONNECTORS

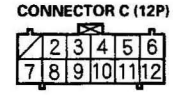
CONNECTOR A (26P)



CONNECTOR B (16P)



CONNECTOR C (12P)



DATA LINK CONNECTOR (16P)

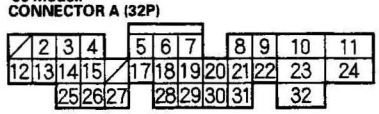


Wire side of female terminals

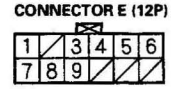
PCM CONNECTORS

'99 Model:

CONNECTOR A (32P)

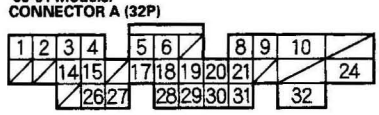


CONNECTOR E (12P)

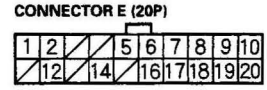


'00-01 Models:

CONNECTOR A (32P)



CONNECTOR E (20P)



Wire side of female terminals

WHEEL SENSOR CONNECTOR FRONT/REAR



Terminal side of male terminals

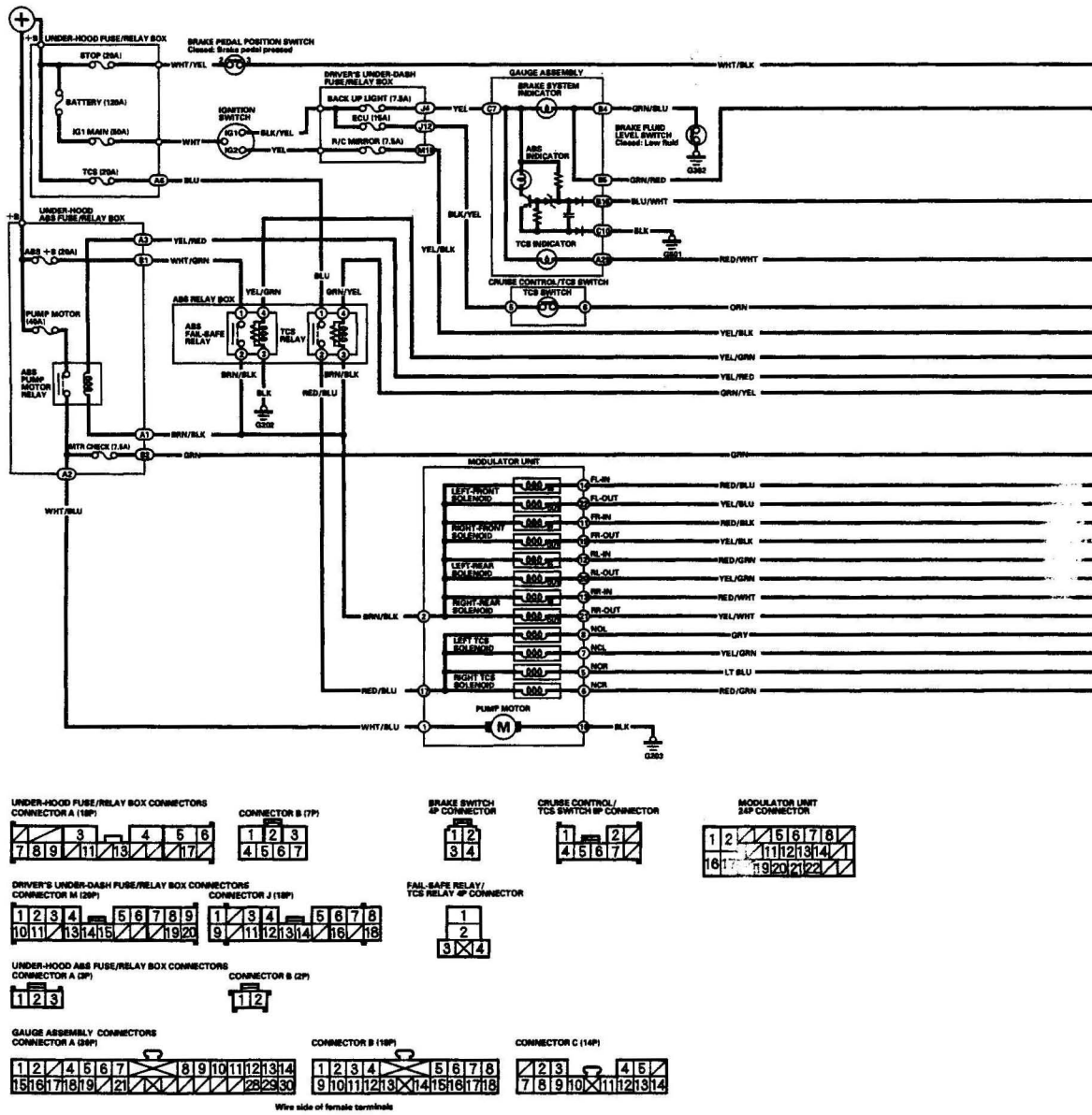
BACK

Protected by AR

ABS/TCS Components

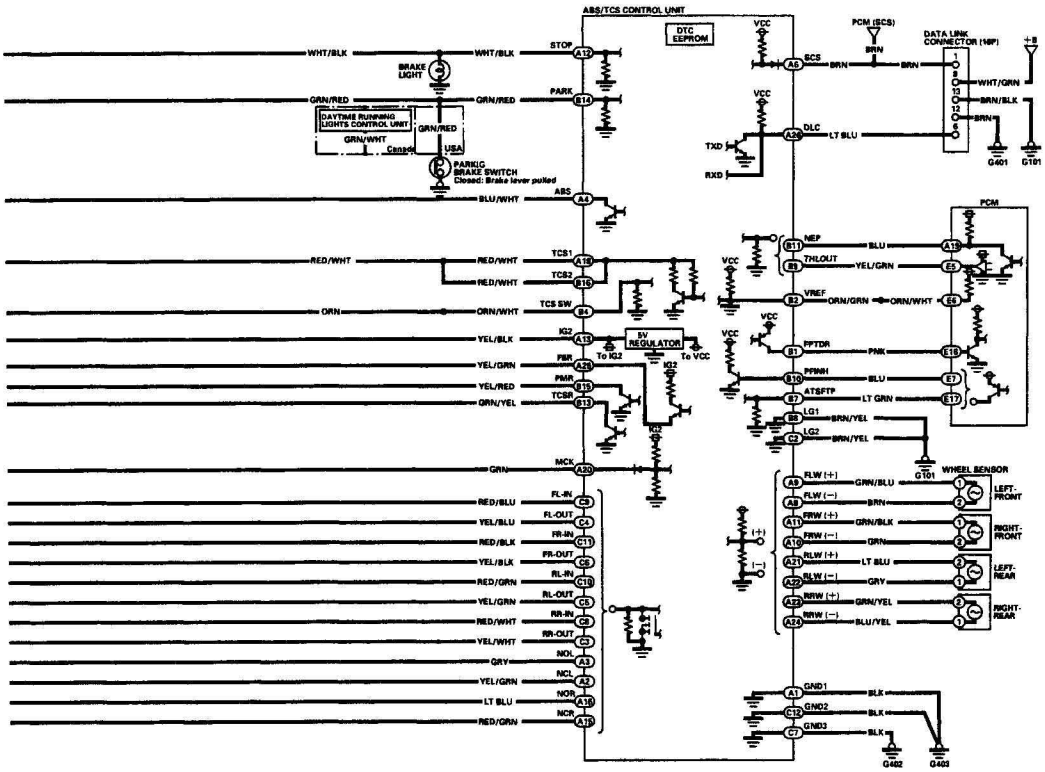
Circuit Diagram (cont'd)

'02-03 Models

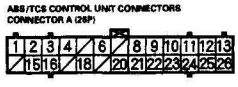


BACK

Protected by AR



ABS/TCS CONTROL UNIT CONNECTORS
CONNECTOR A (26P)



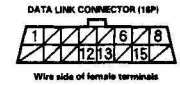
CONNECTOR B (16P)



CONNECTOR C (12P)

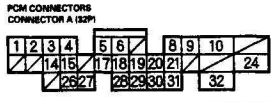


DATA LINK CONNECTOR (16P)

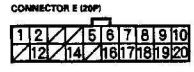


Wire side of female terminals

PCM CONNECTORS
CONNECTOR A (32P)



CONNECTOR E (20P)



Wire side of female terminals

WHEEL SENSOR 2P CONNECTOR FRONT/REAR



Terminal side of male terminals

BACK

Protected by AR

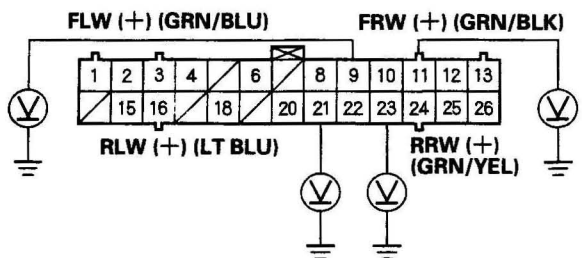
DTC Troubleshooting

ABS DTC 11, 13, 15, 17: Wheel Sensor (Open/Short to Body Ground/Short to Power)

1. Disconnect ABS/TCS control unit connector A (26P).
2. Start the engine.
3. Measure the voltage between the appropriate wheel sensor (+) circuit terminal and body ground (see table).

DTC	Appropriate Terminal
11 (Right-front)	No. 11 : FRW (+)
13 (Left-front)	No. 9 : FLW (+)
15 (Right-rear)	No. 23 : RRW (+)
17 (Left-rear)	No. 21 : RLW (+)

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there 1 V or more?

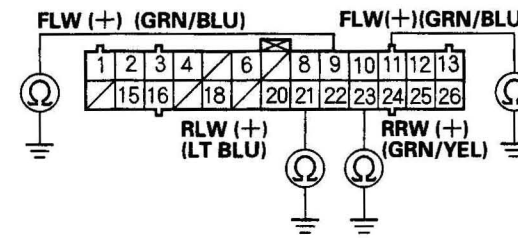
YES – Repair short to power in the (+) circuit wire between the ABS/TCS control unit and the appropriate wheel sensor. ■

NO – Go to step 4.

4. Check for continuity between the appropriate wheel sensor (+) circuit terminal and body ground (see table).

DTC	Appropriate Terminal
11 (Right-front)	No. 11 : FRW (+)
13 (Left-front)	No. 9 : FLW (+)
15 (Right-rear)	No. 23 : RRW (+)
17 (Left-rear)	No. 21 : RLW (+)

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES – Go to step 5.

NO – Go to step 6.

5. Disconnect the harness 2P connector from the appropriate wheel sensor, then check for continuity between the No. 1 and No. 2 terminals of the harness and body ground.

Is there continuity?

YES – Repair short to body ground in the No. 1 or No. 2 circuit wire between the ABS/TCS control unit and the wheel sensor. ■

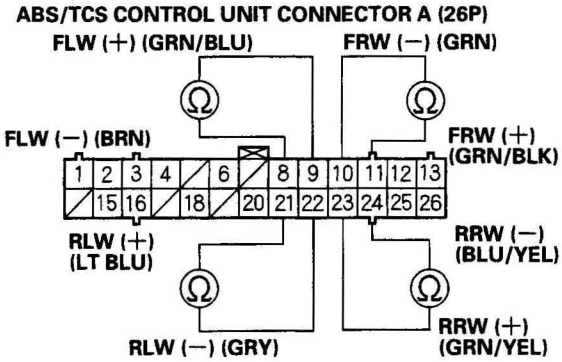
NO – Replace the wheel sensor. ■

BACK

Protected by AR

6. Check the resistance between the appropriate wheel sensor (+) and (−) circuit terminals (see table).

DTC	Appropriate Terminal	
	(+) Side	(−) Side
11 (Right-front)	No. 11 : FRW (+)	No. 10 : FRW (−)
13 (Left-front)	No. 9 : FLW (+)	No. 8 : FLW (−)
15 (Right-rear)	No. 23 : RRW (+)	NO. 24 : RRW (−)
17 (Left-rear)	No. 21 : RLW (+)	No. 22 : RLW (−)



Wire side of female terminals

Is the resistance between 450−2,000 Ω ?

YES−Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck.■

NO−Go to step 7.

7. Disconnect the harness 2P connector from the appropriate wheel sensor, and check the resistance between the (+) and (−) terminals of the wheel sensor.

Is the resistance between 450−2,000 Ω ?

YES−Repair open in the (+) or (−) circuit wire, or short beween the (+) circuit wire and the (−) circuit wire between the ABS/TCS control unit, and the wheel sensor.■

NO−Replace the wheel sensor.■

ABS DTC 12, 14, 16, 18: Wheel Sensor (Electrical Noise/Intermittent Interruption)

NOTE: If the ABS indicator comes on for the reasons described below, the indicator goes off when you test-drive the vehicle at 19 mph (30 km/h).

- Only the drive wheel rotated
- The vehicle spun
- Electrical noise

1. Visually check for appropriate wheel sensor and pulser installation (see table).

DTC	Appropriate Wheel Sensor
12	Right-front
14	Left-front
16	Right-rear
18	Left-rear

Are they installed correctly?

YES−Go to step 2.

NO−Reinstall or replace the appropriate wheel sensor or pulser.■

2. Disconnect ABS/TCS control unit connector A (26P).

3. Measure the resistance between the appropriate wheel sensor (+) and (−) circuit terminals (see table).

DTC	Appropriate Terminal	
	(+) Side	(−) Side
12 (Right-front)	No. 11 : FRW (+)	No. 10 : FRW (−)
14 (Left-front)	No. 9 : FLW (+)	No. 8 : FLW (−)
16 (Right-rear)	No. 23 : RRW (+)	No. 24 : RRW (−)
18 (Left-rear)	No. 21 : RLW (+)	No. 22 : RLW (−)

Is there less than 450 Ω ?

YES−Go to step 4.

NO−Go to step 5.

(cont'd)

BACK

Protected by AR

DTC Troubleshooting (cont'd)

4. Disconnect the harness 2P connector from the appropriate wheel sensor and measure the resistance between the (+) and (−) circuit terminals.

   Is there less than 450 Ω ?

   YES—Replace the wheel sensor.■

   NO—Repair short in the appropriate wheel sensor (+) and (−) circuit wires.■

5. Check for continuity between the appropriate wheel sensor (+) circuit terminal and other wheel sensor (+) circuit terminals (see table).

DTC	Appropriate Terminal	Other Terminal		
12	No. 11 : FRW (+)	No. 9 : FLW (+)	No. 23 : RRW (+)	No. 21 : RLW (+)
14	No. 9 : FLW (+)	No. 11 : FRW (+)	A19: RRW (+)	No. 21 : RLW (+)
16	No. 23 : RRW (+)	No. 11 : FRW (+)	No. 9 : FLW (+)	No. 21 : RLW (+)
18	No. 21 : RLW (+)	No. 11 : FRW (+)	No. 9 : FLW (+)	No. 23 : RRW (+)

   Is there continuity?

   YES—Repair short to wire between the appropriate wheel sensor and the other wheel sensor.■

   NO—Clear the DTC, and test-drive the vehicle. If the ABS/TCS indicator comes on and the same DTC is indicated, replace the ABS/TCS control unit.■

ABS DTC 21, 22, 23, 24: Pulser

1. Clear the DTC.

2. Test-drive the vehicle at 19 mph (30 km/h) or more.

   Does the ABS indicator come on and are DTCs 21, 22, 23, or 24 indicated?

   YES—Go to step 3.

   NO—The system is OK at this time.■

3. Check the appropriate pulser gear for a chipped tooth (see table).

DTC	Appropriate Pulser
21	Right-front
22	Left-front
23	Right-rear
24	Left-rear

   Is the pulser OK?

   YES—Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck.■

   NO—Replace the driveshaft or the hub unit. (Chipped pulser gear)■

BACK

Protected by AR

ABS DTC 31, 32, 33, 34, 35, 36, 37, 38: Solenoid

1. Verify the DTC.

   Is DTC 54 indicated?

   YES – Do the appropriate troubleshooting for DTC 54. ■

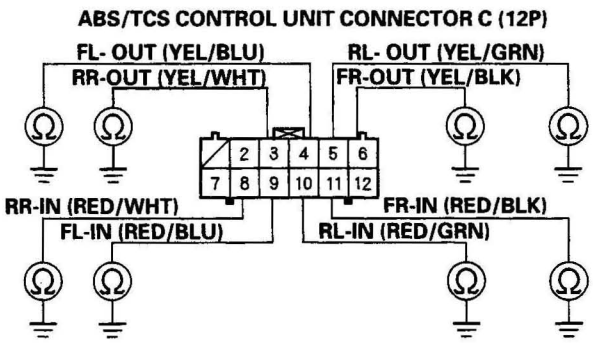
   NO – Go to step 2.

2. Turn the ignition switch OFF.

3. Disconnect the modulator unit 24P connector and ABS/TCS control unit connector C (12P).

4. Check for continuity between the appropriate ABS/TCS control unit connector C (12P) solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 11
32: FR-OUT	No. 6
33: FL-IN	No. 9
34: FL-OUT	No. 4
35: RR-IN	No. 8
36: RR-OUT	No. 3
37: RL-IN	No. 10
38: RL-OUT	No. 5



Wire side of female terminals

Is there continuity?

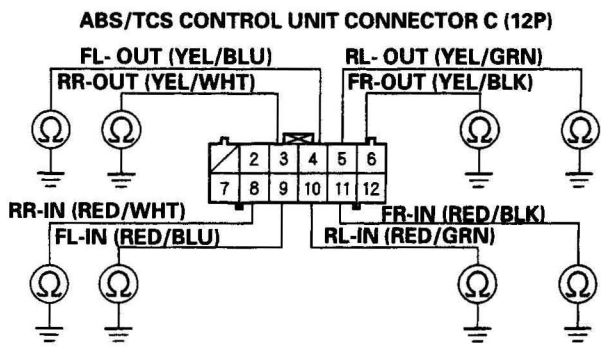
YES – Repair short to body ground in the appropriate solenoid circuit wire between the ABS/TCS control unit and the modulator unit. ■

NO – Go to step 5.

5. Connect the modulator unit 24P connector.

6. Check for continuity between the appropriate ABS/TCS control unit connector C (12P) solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 11
32: FR-OUT	No. 6
33: FL-IN	No. 9
34: FL-OUT	No. 4
35: RR-IN	No. 8
36: RR-OUT	No. 3
37: RL-IN	No. 10
38: RL-OUT	No. 5



Wire side of female terminals

Is there continuity?

YES – Replace the modulator unit. ■

NO – Go to step 7.

7. Disconnect the modulator unit 24P connector.

(cont'd)

BACK

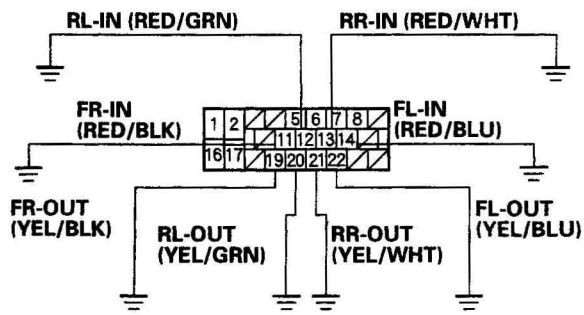
Protected by AR

DTC Troubleshooting (cont'd)

8. Connect the appropriate modulator unit 24P connector solenoid circuit terminal to body ground with a jumper wire (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 11
32: FR-OUT	No. 19
33: FL-IN	No. 14
34: FL-OUT	No. 22
35: RR-IN	No. 13
36: RR-OUT	No. 21
37: RL-IN	No. 12
38: RL-OUT	No. 20

MODULATOR UNIT 24P CONNECTOR

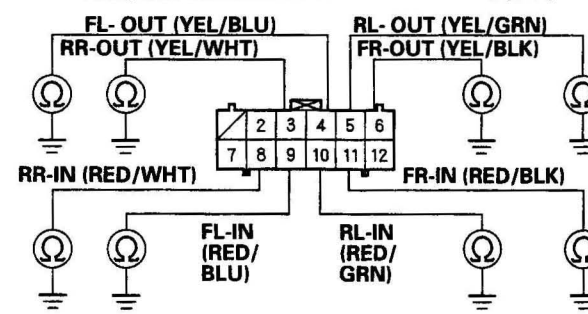


Wire side of female terminals

9. Check for continuity between the appropriate ABS/TCS control unit connector C (12P) solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 11
32: FR-OUT	No. 6
33: FL-IN	No. 9
34: FL-OUT	No. 4
35: RR-IN	No. 8
36: RR-OUT	No. 3
37: RL-IN	No. 10
38: RL-OUT	No. 5

ABS/TCS CONTROL UNIT CONNECTOR C (12P)



Wire side of female terminals

Is there continuity?

YES – Go to step 10.

NO – Repair open in the appropriate solenoid circuit wire between the ABS/TCS control unit and the modulator unit. ■

10. Remove the jumper wire from the modulator unit 24P connector.

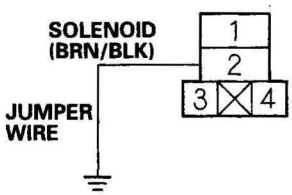
11. Connect the modulator unit 24P connector.

BACK

Protected by AR

12. Connect the ABS fail-safe relay 4P connector terminal No. 2 to body ground with a jumper wire. The wire colors of the ABS fail-safe relay connector are WHT/GRN, BRN/BLK, BLK, and YEL/GRN.

ABS FAIL-SAFE RELAY 4P CONNECTOR

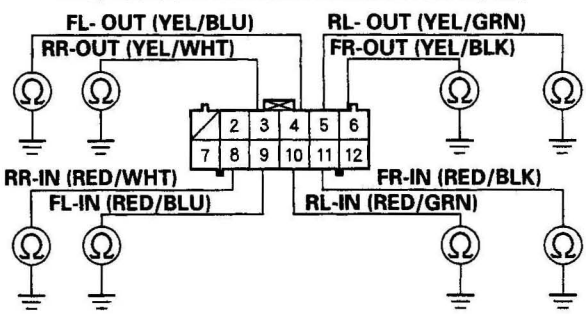


Wire side of female terminals

13. Check the resistance between the appropriate ABS/TCS control unit connector C (12P) terminal and body ground (see table).
IN: 8–10 Ω (at 20°C, 68°F)
OUT: 3–5 Ω (at 20°C, 68°F)

DTC	Appropriate Terminal
31: FR-IN	No. 11
32: FR-OUT	No. 6
33: FL-IN	No. 9
34: FL-OUT	No. 4
35: RR-IN	No. 8
36: RR-OUT	No. 3
37: RL-IN	No. 10
38: RL-OUT	No. 5

ABS/TCS CONTROL UNIT CONNECTOR C (12P)



Wire side of female terminals

Is there resistance OK?

YES—Go to step 14.

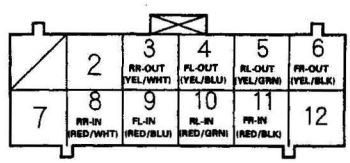
NO—Check for loose modulator unit connectors. If necessary, replace the modulator unit.■

14. Disconnect the modulator unit 24P connector, and remove the jumper wire from the ABS fail-safe relay 4P connector terminal.

15. Check for continuity between the appropriate ABS/TCS control unit connector C (12P) terminal and all other ABS and TCS solenoid circuit terminals (see table).

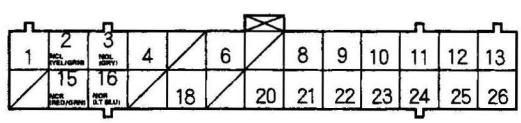
DTC	Appropriate Terminal
31: FR-IN	No. 11
32: FR-OUT	No. 6
33: FL-IN	No. 9
34: FL-OUT	No. 4
35: RR-IN	No. 8
36: RR-OUT	No. 3
37: RL-IN	No. 10
38: RL-OUT	No. 5

ABS/TCS CONTROL UNIT CONNECTOR C (12 P)



Wire side of female terminals

ABS/TCS CONTROL UNIT CONNECTOR A (26 P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the appropriate wires between the ABS/TCS control unit and the modulator unit.■

NO—Go to step 16.

(cont'd)

Protected by AR

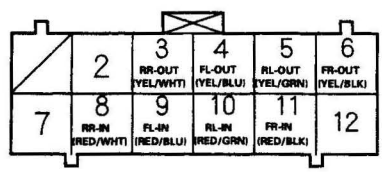
DTC Troubleshooting (cont'd)

16. Connect the modulator unit 24P connector.

17. Check for continuity between the appropriate ABS/TCS control unit connector C (12P) terminal and all other ABS and TCS solenoid circuit terminals (see table).

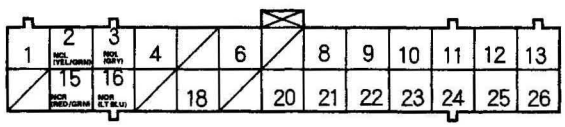
DTC	Appropriate Terminal
31: FR-IN	No. 11
32: FR-OUT	No. 6
33: FL-IN	No. 9
34: FL-OUT	No. 4
35: RR-IN	No. 8
36: RR-OUT	No. 3
37: RL-IN	No. 10
38: RL-OUT	No. 5

ABS/TCS CONTROL UNIT CONNECTOR C (12 P)



Wire side of female terminals

ABS/TCS CONTROL UNIT CONNECTOR A (26 P)



Wire side of female terminals

Is there less than 3 Ω ?

YES—Replace the modulator unit.■

NO—Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck.■

ABS DTC 41, 42, 43, 44: Wheel Lock

1. Check for brake drag.

   Do the brakes drag?

   YES—Repair the brake drag.■

   NO—Go to step 2.

2. Check the installation of the appropriate wheel sensor (see table).

DTC	Appropriate Wheel Sensor
41	Right-front
42	Left-front
43	Right-rear
44	Left-rear

   Is it correct?

   YES—Go to step 3.■

   NO—Reinstall the wheel sensor correctly.■

3. Check the modulator using the Honda PGM Tester.

   Is kickback felt in the pedal?

   YES—The probable cause was the vehicle spun during cornering. If the problem recurs, check for loose connectors, or try a known-good ABS/TCS control unit, and recheck.■

   NO—Check for loose modulator unit connectors. If necessary, replace the modulator unit.■

BACK

Protected by AR

ABS DTC 51: Motor Lock

1. Clear the DTC.
2. Test-drive the vehicle at 6 mph (10 km/h) or more.

   Does the ABS indicator come on and is DTC 51 indicated?

   YES—Replace the modulator unit. ■

   NO—The system is OK at this time. ■

ABS DTC 52: Motor Stuck OFF ('99-01 Models)

1. Check the ABS MOTOR (30A) fuse in the under-hood fuse/relay box, and reinstall the fuse if it is OK.

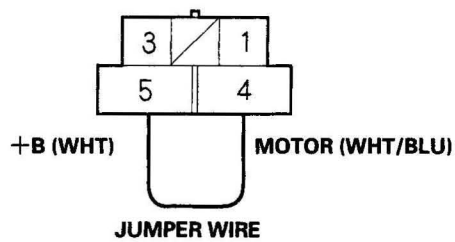
   Is the fuse OK?

   YES—Go to step 3.

   NO—Replace the fuse, and go to step 2.

2. Connect the pump motor relay connector terminal No. 4 to No. 5 with a jumper wire for a moment, and check the fuse.

PUMP MOTOR RELAY CONNECTOR



Terminal side of female terminals

   Is the fuse blown?

   YES—Check for a short to body ground in the motor power source circuit. ■

   NO—Go to step 3.

3. Check the ABS MOTOR CHECK (7.5A) fuse in the passenger's under-dash fuse/relay box, and reinstall the fuse if it is OK.

   Is the fuse OK?

   YES—Go to step 5.

   NO—Replace the fuse, and go to step 4.

(cont'd)

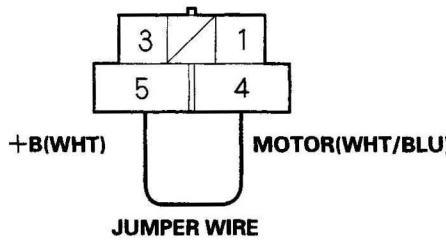
BACK

Protected by AR

DTC Troubleshooting (cont'd)

4. Connect the pump motor relay connector terminal No. 4 to No. 5 with a jumper wire for a moment, and check the fuse.

PUMP MOTOR RELAY CONNECTOR



Terminal side of female terminals

Is the fuse blown?

YES—Check for a short to body ground in the MCK circuit.■

NO—Go to step 5.

5. Check the pump motor relay in the under-hood ABS relay box (see page 22-103).

Is the relay OK?

YES—Go to step 6.

NO—Replace the pump motor relay.■

6. Connect the pump motor relay connector terminal No. 4 to No. 5 with a jumper wire for a moment.

Does the pump motor operate?

YES—Go to step 11.

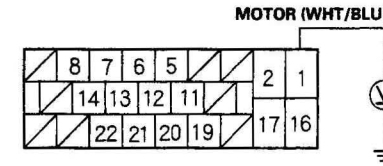
NO—Go to step 7.

7. Disconnect the modulator unit connector.

8. Connect the pump motor relay connector terminal No. 4 to No. 5 with a jumper wire.

9. Measure the voltage between the modulator unit connector terminal No. 1 and body ground.

MODULATOR UNIT CONNNECTOR



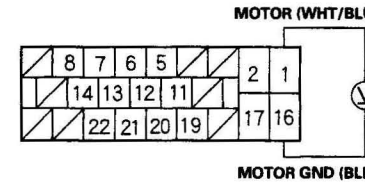
Terminal side of female terminals

Is there battery voltage?

YES—Go to step 10.
NO—Repair open in the wire between the under-hood ABS relay box and pump motor.■

10. Measure the voltage between the modulator unit connector terminal No. 1 and No. 16.

MODULATOR UNIT CONNNECTOR



Terminal side of female terminals

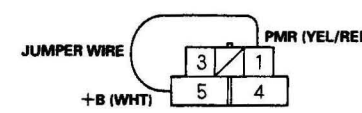
Is there battery voltage?

YES—Replace the modulator unit.■
NO—Repair open in the wire between the pump motor and body ground (G203).■

11. Disconnect the ABS/TCS control unit connector B (16P).

12. Connect the pump motor relay connector terminal No. 1 to No. 5 with a jumper wire.

PUMP MOTOR RELAY CONNNECTOR



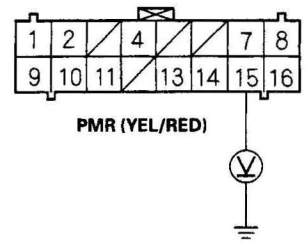
Terminal side of female terminals

BACK

Protected by AR

13. Measure the voltage between the ABS/TCS control unit connector B (16P) terminal No. 15 and body ground.

ABS/TCS CONTROL UNIT CONNNECTOR B (16 P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 14.

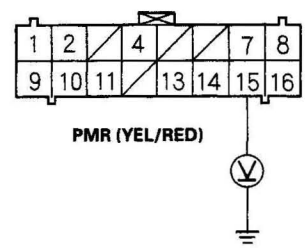
NO – Repair open in the wire between the under-hood ABS relay box and the ABS/TCS control unit. ■

14. Remove the jumper wire from the pump motor relay connector.

15. Start the engine.

16. Measure the voltage between the ABS/TCS control unit connector B (16P) terminal No. 15 and body ground.

ABS/TCS CONTROL UNIT CONNNECTOR B (16P)



Wire side of female terminals

Is there battery voltage?

YES – Repair short to power in the wire between the under-hood ABS relay box and the ABS/TCS control unit. ■

NO – If the problem recurs, replace the ABS/TCS control unit. ■

ABS DTC 52: Motor Stuck OFF ('02-03 Models)

1. Check the PUMP MOTOR (40A) fuse in the under-hood ABS fuse/relay box.

Is the fuse OK?

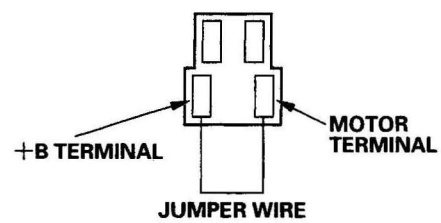
YES – Go to step 4.

NO – Replace the fuse, and go to step 2.

2. Remove the ABS pump motor relay from the under-hood ABS fuse/relay box.

3. Connect the ABS pump motor relay connector +B and MOTOR terminals with a jumper wire for a moment, and check the fuse.

ABS PUMP MOTOR RELAY CONNECTOR



Is the fuse blown?

YES – Check for a short to body ground in the motor power source circuit. ■

NO – Go to step 4.

4. Check the MTR CHECK (7.5A) fuse in the under-hood ABS fuse/relay box.

Is the fuse OK?

YES – With the fuse removed, go to step 6.

NO – Replace the fuse, and go to step 5.

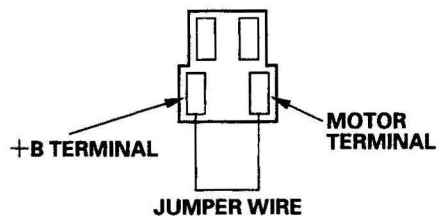
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

5. Connect the ABS pump motor relay connector +B and MOTOR terminals with a jumper wire for a moment, and check the fuse.

PUMP MOTOR RELAY CONNECTOR



Is the fuse blown?

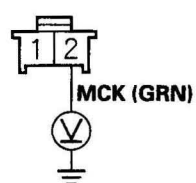
YES – Check for a short to body ground in the MCK circuit. ■

NO – Remove the fuse, and go to step 6.

6. Turn the ignition switch ON (II).

7. Measure the voltage between under-hood ABS fuse/relay box connector B (2P) terminal No. 2 and body ground.

UNDER-HOOD ABS FUSE/RELAY BOX CONNECTOR B (2P)



Wire side of female terminals

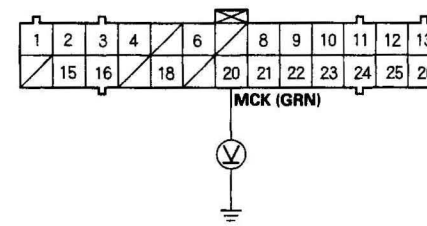
Is there about 10 V?

YES – Go to step 9.

NO – Go to step 8.

8. Measure the voltage between ABS/TCS control unit connector A (26P) terminal No. 20 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there about 10 V?

YES – Repair open in the wire between the under-hood ABS fuse/relay box and the ABS/TCS control unit. ■

NO – Check for loose ABS/TCS control unit connectors. If the problem recurs, replace the ABS/TCS control unit. ■

9. Check the ABS pump motor relay in the under-hood ABS fuse/relay box.

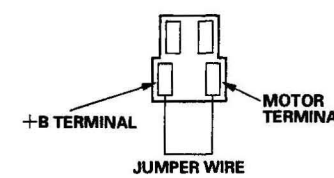
Is the relay OK?

YES – Go to step 9.

NO – Replace the ABS pump motor relay. ■

10. Connect the ABS pump motor relay connector +B and MOTOR terminals with a jumper wire for a moment.

ABS PUMP MOTOR RELAY CONNECTOR



Does the ABS pump motor operate?

YES – Go to step 15.

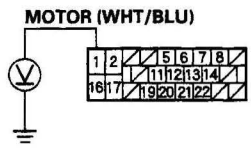
NO – Go to step 11.

BACK

Protected by AR

11. Disconnect the modulator unit 24P connector.
12. Connect the ABS pump motor relay connector +B and MOTOR terminals with a jumper wire.
13. Measure the voltage between the modulator unit 24P connector terminal No. 1 and body ground.

MODULATOR UNIT 24P CONNECTOR



Wire side of female terminals

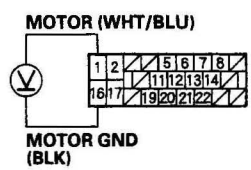
Is there battery voltage?

YES – Go to step 14.

NO – Repair open in the wire between the under-hood ABS fuse/relay box and the pump motor. ■

14. Measure the voltage between the modulator unit 24P connector terminals No. 1 and No. 16.

MODULATOR UNIT 24P CONNECTOR



Wire side of female terminals

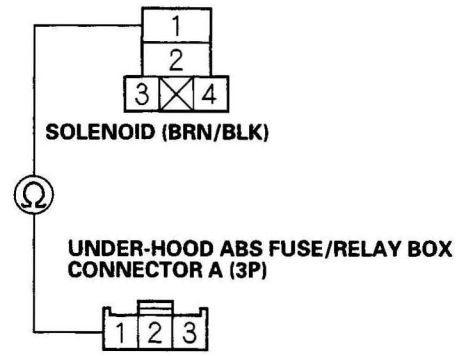
Is there battery voltage?

YES – Replace the modulator unit. ■

NO – Repair open in the wire between the pump motor and body ground (G203). ■

15. Remove the fail-safe relay from the ABS relay box.
16. Disconnect under-hood ABS fuse/relay box connector A (3P).
17. Check for continuity between the ABS fail-safe relay connector terminal No. 2 and under-hood ABS fuse/relay box connector A (3P) terminal No. 1.

ABS FAIL-SAFE RELAY 4P CONNECTOR



Wire side of female terminals

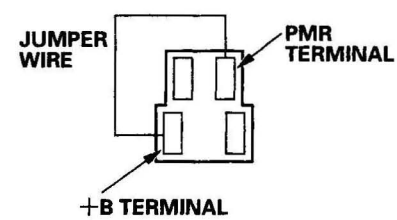
Is there continuity?

YES – Go to step 18.

NO – Repair open in the wire between the ABS fail-safe relay and the under-hood ABS fuse/relay box. ■

18. Disconnect ABS/TCS control unit connector B (16P), and reconnect under-hood ABS fuse/relay box connector A (3P).
19. Connect the ABS pump motor relay connector +B and PMR terminals with a jumper wire.

ABS PUMP MOTOR RELAY CONNECTOR



(cont'd)

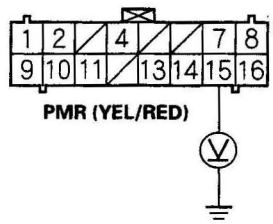
BACK

Protected by AR

DTC Troubleshooting (cont'd)

20. Measure the voltage between the ABS/TCS control unit connector B (16P) terminal No. 15 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there battery voltage?

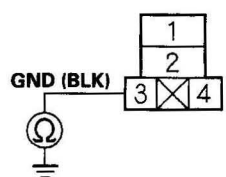
YES – Go to step 21.

NO – Repair open in the wire between the under-hood ABS fuse/relay box and ABS/TCS control unit. ■

21. Remove the jumper wire from the ABS pump motor relay connector.

22. Check for continuity between the ABS fail-safe relay 4P connector terminal No. 3 and body ground.

ABS FAIL-SAFE RELAY 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck.

NO – Repair open in the wire between the ABS fail-safe relay and body ground (G202). ■

ABS DTC 53: Motor Stuck ON ('99-01 Models)

1. Check that the pump motor operates with the ignition switch OFF.

Does the pump motor operate?

YES – Replace the pump motor relay. (Pump motor relay stuck ON.) ■

NO – Go to step 2.

2. Remove the ABS MOTOR CHECK (7.5A) fuse in the passenger's under-dash fuse/relay box.

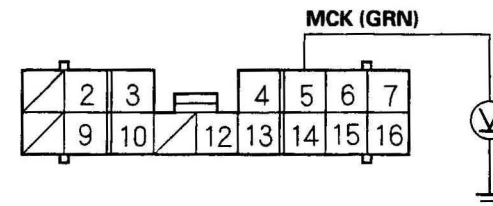
Is the fuse OK?

YES – Remove the fuse, and go to step 3.

NO – Replace the fuse, and recheck. ■

3. Connect a voltmeter between the passenger's under-dash fuse/relay box connector J (16P) terminal No. 5 and body ground, then turn the ignition switch ON (II).

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR J (16P)



Wire side of female terminals

Is there about 10 V momentarily when the ignition switch is first turned ON?

YES – Go to step 4.

NO – Repair open in the wire between the passenger's under-dash fuse/relay box and the ABS/TCS control unit. ■

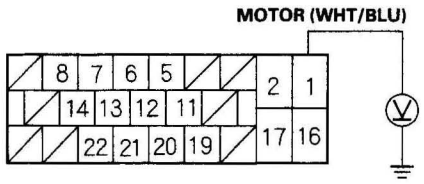
4. Reinstall the ABS MOTOR CHECK (7.5A) fuse in the passenger's under-dash fuse/relay box.

BACK

Protected by AR

5. Turn the ignition switch OFF.
6. Disconnect the modulator unit connector.
7. Connect a voltmeter between terminal No. 1 and body ground, and turn the ignition switch ON (II).

MODULATOR UNIT CONNECTOR



Terminal side of female terminals

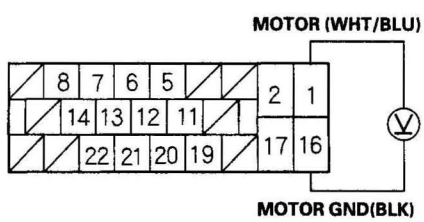
Is there about 10 V momentarily when the ignition switch is first turned on?

YES – Go to step 8.

NO – Repair open in the wire between the under-hood ABS relay box and the pump motor. ■

8. Turn the ignition switch OFF.
9. Connect a voltmeter between the modulator unit connector terminal No. 1 and No. 16, and turn the ignition switch ON (II).

MODULATOR UNIT CONNECTOR



Terminal side of female terminals

Is there about 10 V momentarily when the ignition switch is first turned ON?

YES – Go to step 10.

NO – Repair open in the wire between the pump motor and body ground (G203). ■

10. Remove the pump motor relay, then connect relay terminals No. 3 and No. 5 together with a jumper wire.

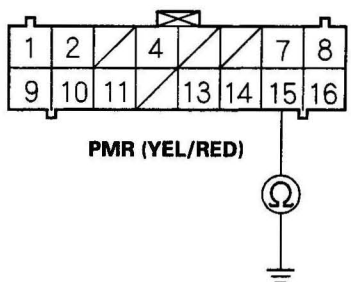
Does the pump motor run?

YES – Go to step 11.

NO – Replace the pump motor. ■

11. Disconnect the ABS/TCS control unit connector B (16P).
12. Check for continuity between terminal No. 15 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the wire between the under-hood ABS relay box and the ABS/TCS control unit. ■

NO – If the problem recurs, replace the ABS/TCS control unit. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

ABS DTC 53: Motor Stuck ON ('02-03 Models)

1. Check for pump motor operation with the ignition switch OFF.

   Does the pump motor operate?

   YES – Replace the pump motor relay. (Pump motor relay stuck ON.) ■

   NO – Go to step 2.

2. Remove the MTR CHECK (7.5A) fuse in the under-hood ABS fuse/relay box.

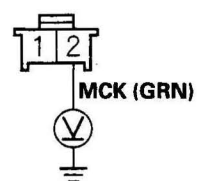
   Is the fuse OK?

   YES – Remove the fuse, and go to step 3.

   NO – Replace the fuse, and recheck. ■

3. Connect a voltmeter between under-hood ABS fuse/relay box connector B (2P) terminal No. 2 and body ground, then turn the ignition switch ON (II).

UNDER-HOOD ABS FUSE/RELAY BOX CONNECTOR B (2P)



Wire side of female terminals

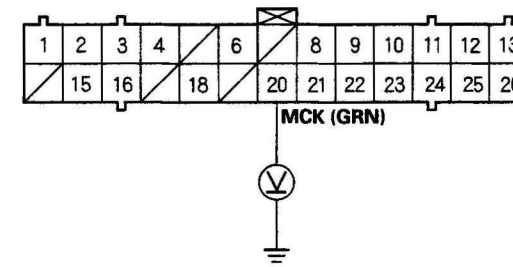
Is there about 10 V momentarily when the ignition switch is first turned ON?

YES – Go to step 5.

NO – Turn the ignition switch OFF, and go to step 4.

4. Connect a voltmeter between ABS/TCS control unit connector A (26P) terminal No. 20 and body ground, then turn the ignition switch ON (II).

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there about 10 V momentarily when the ignition switch is first turned ON?

YES – Repair open in the wire between the under-hood ABS fuse/relay box and the ABS/TCS control unit. ■

NO – Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck. ■

5. Reinstall the MTR CHECK (7.5A) fuse in the under-hood ABS fuse/relay box.

6. Turn the ignition switch OFF.

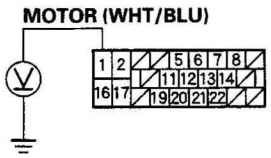
7. Disconnect the modulator unit 24P connector.

BACK

Protected by AR

8. Connect a voltmeter between terminal No. 1 and body ground, and turn the ignition switch ON (II).

MODULATOR UNIT 24P CONNECTOR



Wire side of female terminals

Is there about 10 V momentarily when the ignition switch is first turned ON?

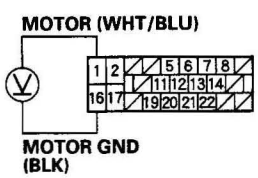
YES – Go to step 9.

NO – Repair open in the wire between the under-hood ABS fuse/relay box and the pump motor. ■

9. Turn the ignition switch OFF.

10. Connect a voltmeter between the modulator unit 24P connector terminal No. 1 and No. 16, and turn the ignition switch ON (II).

MODULATOR UNIT 24P CONNECTOR



Wire side of female terminals

Is there about 10 V momentarily when the ignition switch is first turned ON?

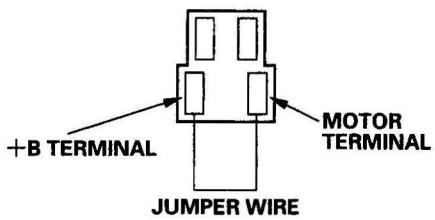
YES – Go to step 11.

NO – Repair open in the wire between the pump motor and body ground (G203). ■

11. Connect the modulator unit 24P connector.

12. Remove the pump motor relay, then connect relay +B and MOTOR terminals together with a jumper wire.

PUMP MOTOR RELAY CONNECTOR



Does the pump motor run?

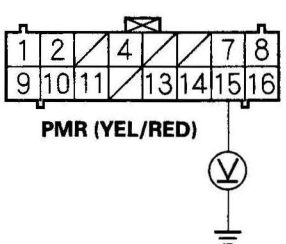
YES – Go to step 13.

NO – Replace the modulator unit. ■

13. Disconnect ABS/TCS control unit connector B (16P).

14. Check for continuity between terminal No. 15 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the wire between the under-hood ABS relay box and the ABS/TCS control unit. ■

NO – Check for loose ABS/TCS control unit connectors. If the problem recurs, replace the ABS/TCS control unit. ■

Protected by AR

DTC Troubleshooting (cont'd)

ABS DTC 54: ABS Fail-safe Relay

1. Check the ABS F/S (20A) fuse in the under-hood fuse/relay box ('99-01 models) or the ABS+B (20A) fuse in the under-hood ABS fuse/relay box ('02-03 models).

   Is the fuse OK?

   YES—Reinstall the fuse, and go to step 2.

   NO—Replace the fuse, and recheck. If the fuse blows with the ignition switch OFF, repair short to body ground between the ABS fail-safe relay and ABS F/S (20A) fuse or ABS+B (20A) fuse.■

2. Turn the ignition switch ON (II).

   Does the fuse blow?

   YES—Repair short to body ground in the wire between the ABS fail-safe relay, TCS relay, ABS pump motor relay, and modulator unit.■

   NO—Go to step 3.

3. Check the ABS fail-safe relay in the ABS relay box. The wire colors of the ABS fail-safe relay connectors are WHT/GRN, BRN/BLK, BLK, and YEL/GRN.

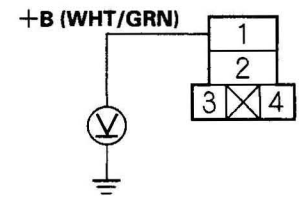
   Is the relay OK?

   YES—Leave the ABS fail-safe relay removed, and go to step 4.

   NO—Replace the ABS fail-safe relay.■

4. Measure the voltage between the ABS fail-safe relay 4P connector terminal No. 1 and body ground.

   ABS FAIL-SAFE RELAY 4P CONNECTOR



   Wire side of female terminals

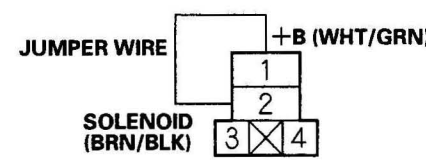
   Is there battery voltage?

   YES—Go to step 5.

   NO—Repair open in the wire between the under-hood ABS fuse/relay box and the ABS fail-safe relay.■

5. Connect the ABS fail-safe relay 4P connector terminal No. 1 to No. 2 with a jumper wire.

   ABS FAIL-SAFE RELAY 4P CONNECTOR



   Wire side of female terminals

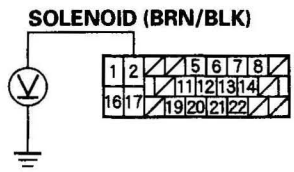
6. Disconnect the modulator unit 24P connector.

BACK

Protected by AR

7. Measure the voltage between terminal No. 2 and body ground.

MODULATOR UNIT 24P CONNECTOR



Wire side of female terminals

Is there battery voltage?

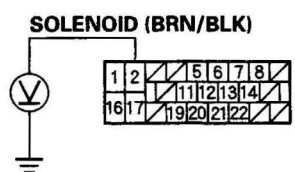
YES – Go to step 8.

NO – Repair open in the wire between the ABS fail-safe relay and the modulator unit. ■

8. Remove the jumper wire from the ABS fail-safe relay 4P connector.

9. Measure the voltage between the modulator unit 24P connector terminal No. 2 and body ground.

MODULATOR UNIT 24P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Repair short to power in the wire between the ABS fail-safe relay, TCS relay, modulator unit, and under-hood ABS fuse/relay box. ■

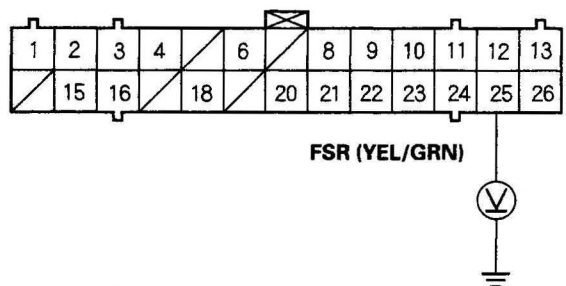
NO – Go to step 10.

10. Disconnect ABS/TCS control unit connector A (26P).

11. Turn the ignition switch ON (II).

12. Measure the voltage between terminal No. 25 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there battery voltage?

YES – Repair short to power in the wire between the ABS/TCS control unit and the ABS fail-safe relay. ■

NO – Go to step 13.

(cont'd)

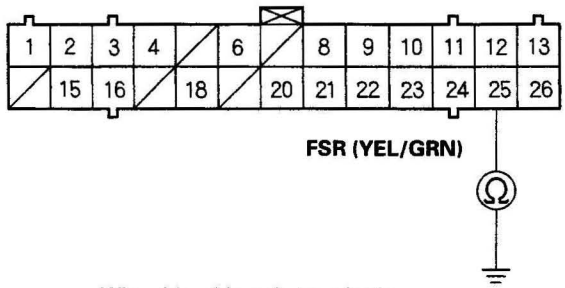
BACK

Protected by AR

DTC Troubleshooting (cont'd)

13. Check for continuity between ABS/TCS control unit connector A (26P) terminal No. 25 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

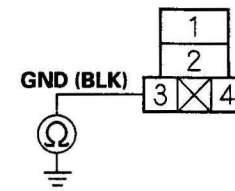
Is there continuity?

YES – Repair short to body ground in the wire between the ABS/TCS control unit and the ABS fail-safe relay. ■

NO – Go to step 14.

14. Check for continuity between the ABS fail-safe relay 4P connector terminal No. 3 and body ground.

ABS FAIL-SAFE RELAY 4P CONNECTOR



Wire side of female terminals

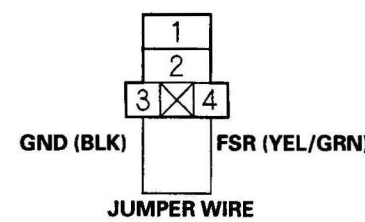
Is there continuity?

YES – Go to step 15.

NO – Repair open in the wire between the ABS fail-safe relay and body ground, or a loose or poor connection at body ground (G202). ■

15. Connect the ABS fail-safe relay 4P connector terminals No. 3 and No. 4 with a jumper wire.

ABS FAIL-SAFE RELAY 4P CONNECTOR



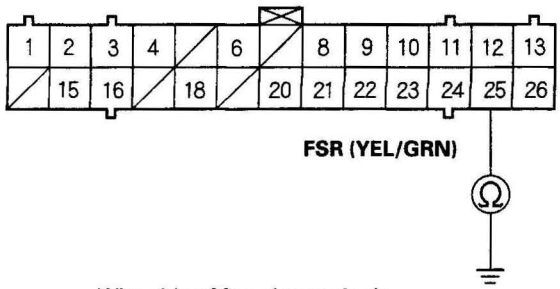
Wire side of female terminals

BACK

Protected by AR

16. Check for continuity between ABS/TCS control unit connector A (26P) terminal No. 25 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES – Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck. ■

NO – Repair open in the wire between the ABS/TCS control unit and the ABS fail-safe relay. ■

ABS DTC 61, 62: Ignition Voltage

1. Clear the DTC.
2. Test-drive the vehicle at 6 mph (10 km/h) or more.

   Does the ABS indicator come on?

   YES – Go to step 3.

   NO – The system is OK at this time. ■
3. Verify the DTC.

   Is DTC 61 or 62 indicated?

   YES – Check the charging system. ■

   NO – Do the appropriate troubleshooting for the DTC. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

ABS DTC 71: Different Diameter Tire

1. Clear the DTC.
2. Test-drive the vehicle.

   Does the ABS indicator come on and is DTC 71 indicated?

   YES – Make sure all four tires are the specified size and properly inflated. ■

   NO – Intermittent failure; the vehicle is OK at this time. ■

ABS DTC 81: Central Processing Unit (CPU) Diagnosis, and ROM/RAM Diagnosis

1. Check for other ABS or TCS DTCs.

   Are there any other DTCs indicated?

   YES – Do the appropriate troubleshooting for the DTC indicated. ■

   NO – Go to step 2.

2. Clear the DTC.
3. Test-drive the vehicle.

   Does the ABS indicator come on and is DTC 81 indicated?

   YES – Replace the ABS/TCS control unit. ■

   NO – Intermittent failure; the vehicle is OK at this time. ■

BACK

Protected by AR

TCS DTC 24, 25, 26, 27: TCS Solenoid

1. Verify the TCS DTC.

   Is TCS DTC 28 indicated?

   YES – Do the appropriate troubleshooting for DTC 28.■

   NO – Go to step 2.

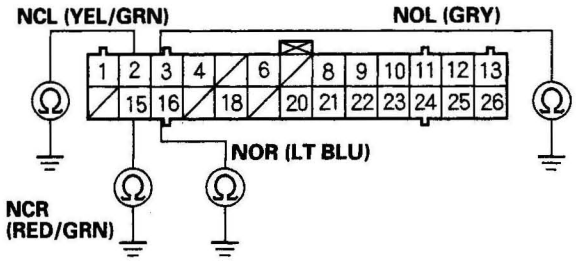
2. Turn the ignition switch OFF.

3. Disconnect the modulator unit 24P connector and ABS/TCS control unit connector A (26P).

4. Check for continuity between the appropriate ABS/TCS control unit connector A (26P) TCS solenoid circuit terminal and body ground (see table).

TCS DTC	Appropriate Terminal
24: NOR	No. 16
25: NCR	No. 15
26: NOL	No. 3
27: NCL	No. 2

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the appropriate solenoid circuit wire between the ABS/TCS control unit and the modulator unit.■

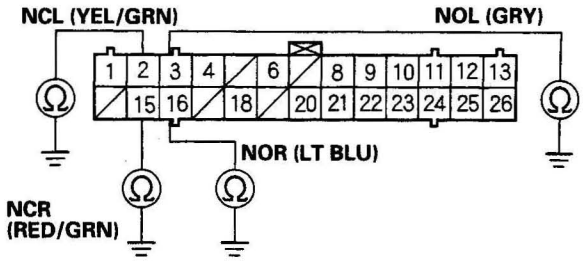
NO – Go to step 5.

5. Connect the modulator unit 24P connector.

6. Check for continuity between the appropriate ABS/TCS control unit connector A (26P) solenoid circuit terminal and body ground (see table).

TCS DTC	Appropriate Terminal
24: NOR	No. 16
25: NCR	No. 15
26: NOL	No. 3
27: NCL	No. 2

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES – Replace the modulator unit.■

NO – Go to step 7.

7. Disconnect the modulator unit 24P connector.

(cont'd)

BACK

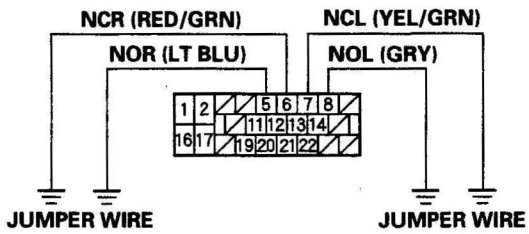
Protected by AR

DTC Troubleshooting (cont'd)

8. Connect the appropriate modulator unit 24P connector TCS solenoid circuit terminals to body ground with jumper wires (see table).

TCS DTC	Appropriate Terminal
24: NOR	No. 5
25: NCR	No. 6
26: NOL	No. 8
27: NCL	No. 7

MODULATOR UNIT 24P CONNECTOR

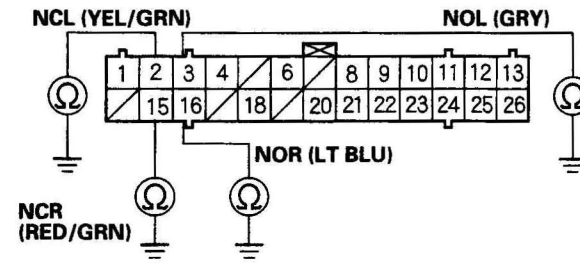


Wire side of female terminals

9. Check for continuity between the appropriate ABS/TCS control unit connector A (26P) solenoid circuit terminal and body ground (see table).

TCS DTC	Appropriate Terminal
24: NOR	No. 16
25: NCR	No. 15
26: NOL	No. 3
27: NCL	No. 2

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is there continuity?

YES – Go to step 10.

NO – Repair open in the appropriate TCS solenoid circuit wire between the ABS/TCS control unit and the modulator unit.■

10. Remove the jumper wires from the modulator unit 24P connector.

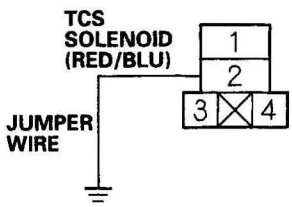
11. Connect the modulator unit 24P connector.

BACK

Protected by AR

12. Remove the TCS relay, and connect the TCS relay 4P connector terminal No. 2 to body ground with a jumper wire. The wire colors of the TCS relay 4P connector are BLU, RED/BLU, BRN/BLK, and GRN/YEL.

TCS RELAY 4P CONNECTOR

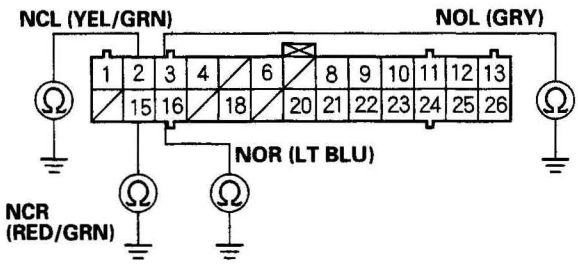


Wire side of female terminals

13. Check the resistance between the appropriate ABS/TCS control unit connector A (26P) terminal and body ground (see table).
NOR, NOL, NCR, NCL: 8 – 10 Ω (at 20°C, 68°F)

TCS DTC	Appropriate Terminal
24: NOR	No. 16
25: NCR	No. 15
26: NOL	No. 3
27: NCL	No. 2

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

Is the resistance OK?

YES – Go to step 14.

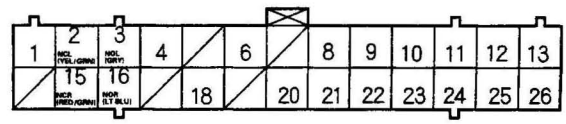
NO – Replace the modulator unit. ■

14. Disconnect the modulator unit 24P connector, and remove the jumper wire from the TCS relay connector terminal.

15. Check for continuity between the appropriate ABS/TCS control unit connector A (26P) terminal and each of the other terminals listed (see table).

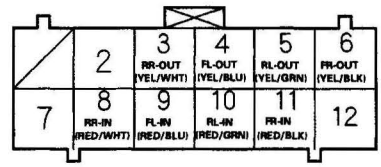
TCS DTC	Appropriate Terminal
24: NOR	No. 16
25: NCR	No. 15
26: NOL	No. 3
27: NCL	No. 2

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

ABS/TCS CONTROL UNIT CONNECTOR C (12P)



Wire side of female terminals

Is there continuity?

YES – Repair short in the appropriate wires between the ABS/TCS control unit and the modulator unit. ■

NO – Go to step 16.

(cont'd)

Protected by AR

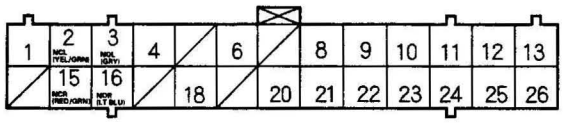
DTC Troubleshooting (cont'd)

16. Connect the modulator unit 24P connector.

17. Check for continuity between the appropriate ABS/TCS control unit connector A (26P) terminal and all other ABS and TCS solenoid circuit terminals (see table).

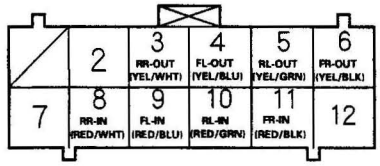
TCS DTC	Appropriate Terminal
24: NOR	No. 16
25: NCR	No. 15
26: NOL	No. 3
27: NCL	No. 2

ABS/TCS CONTROL UNIT CONNECTOR A (26P)



Wire side of female terminals

ABS/TCS CONTROL UNIT CONNECTOR C (12P)



Wire side of female terminals

Is there less than 3 Ω ?

YES—Replace the modulator unit.■

NO—Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck.■

TCS DTC 28: TCS Relay

1. Check the TCS (20A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES—Reinstall the fuse, and go to step 2.

   NO—Replace the fuse, and recheck. If the fuse blows with the ignition switch OFF, repair short to ground between the under-hood ABS fuse/relay box and the TCS relay.■

2. Turn the ignition switch ON (II).

   Does the fuse blow?

   YES—Repair short to body ground in the wire between the TCS relay, and modulator unit.■

   NO—Go to step 3.

3. Check the TCS relay in the ABS relay box. The wire colors of TCS relay 4P connectors are BLU, RED/BLU, BRN/BLK, and GRN/YEL.

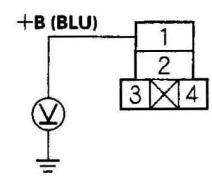
   Is the relay OK?

   YES—Do not reinstall the TCS relay, and go to step 4.

   NO—Replace the TCS relay.■

4. Measure the voltage between the TCS relay 4P connector terminal No. 1 and body ground.

TCS RELAY CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 5.

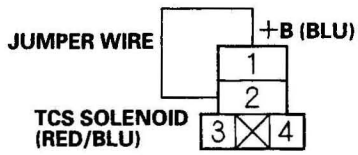
NO—Repair open in the wire between the under-hood fuse/relay box and the TCS relay.■

BACK

Protected by AR

5. Connect the TCS relay 4P connector terminal No. 1 to No. 2 with a jumper wire.

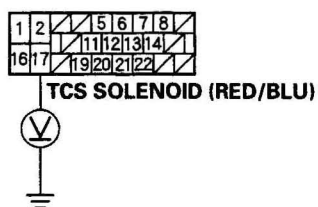
TCS RELAY 4P CONNECTOR



Wire side of female terminals

6. Disconnect the modulator unit 24P connector.
7. Measure the voltage between terminal No.17 and body ground.

MODULATOR UNIT 24P CONNECTOR



Wire side of female terminals

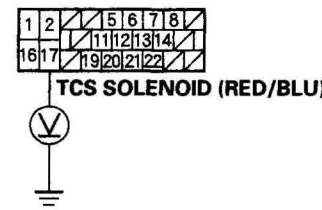
Is there battery voltage?

YES – Go to step 8.

NO – Repair open in the wire between the TCS relay and the modulator unit. ■

8. Remove the jumper wire from the TCS relay 4P connector.
9. Measure the voltage between the modulator unit 24P connector terminal No. 17 and body ground.

MODULATOR UNIT 24P CONNECTOR



Wire side of female terminals

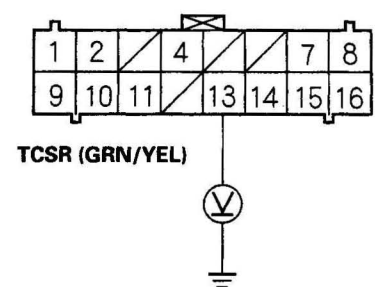
Is there battery voltage?

YES – Repair short to power in the wire between the TCS relay and the modulator unit. ■

NO – Go to step 10.

10. Disconnect ABS/TCS control unit connector B (16P).
11. Measure the voltage between terminal No. 13 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there battery voltage?

YES – Repair short to power in the wire between the ABS/TCS control unit and the TCS relay. ■

NO – Go to step 12.

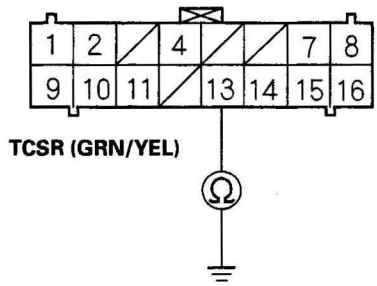
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

12. Check for continuity between ABS/TCS control unit connector B (16P) terminal No. 13 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the wire between the ABS/TCS control unit and the TCS relay. ■

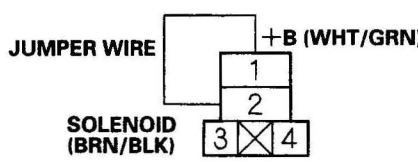
NO – Go to step 13.

13. Turn the ignition switch OFF.

14. Remove the fail-safe relay. The wire colors of the fail-safe relay 4P connector are WHT/GRN, BRN/BLK, BLK, and YEL/GRN.

15. Connect the fail-safe relay 4P connector terminal No. 1 and No. 2 with a jumper wire.

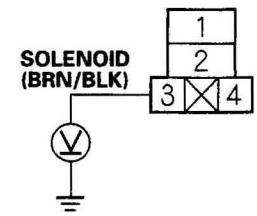
FAIL-SAFE RELAY 4P CONNECTOR



Wire side of female terminals

16. Measure the voltage between the TCS relay 4P connector terminal No. 3 and body ground.

TCS RELAY 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

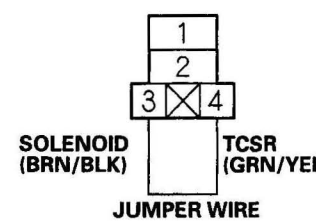
YES – Go to step 17.

NO – Repair open in the wire between the fail-safe relay and TCS relay. ■

17. Connect the TCS relay 4P connector No. 3 and No. 4 with a jumper wire.

NOTE: Make sure ABS/TCS control unit connector B (16P) is disconnected.

TCS RELAY 4P CONNECTOR



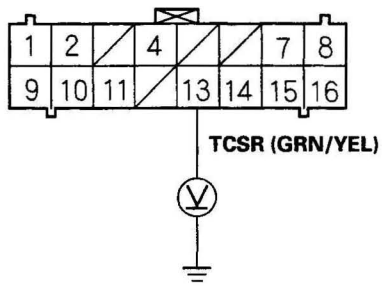
Wire side of female terminals

BACK

Protected by AR

18. Measure the voltage between ABS/TCS control unit connector B (16P) terminal No. 13 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there battery voltage?

YES—Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck. ■

NO—Repair open in the wire between the TCS relay and the ABS/TCS control unit. ■

TCS DTC 31: Engine Retard Command (PFINH) signal

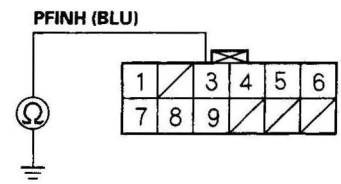
NOTE: If the MIL or ABS indicator is ON, troubleshoot the PGM-FI or ABS first.

1. Disconnect the PCM connector E (12P: '99 model, 20P: '00-03 models) and ABS/TCS control unit connector B (16P).

2. Check for continuity between the PCM connector E terminal No. 3 ('99 model) or No. 7 ('00-03 models) and body ground.

'99 model:

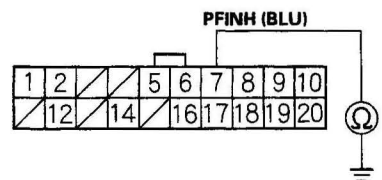
PCM CONNECTOR E (12P)



Wire side of female terminals

'00-03 models:

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between the PCM and the ABS/TCS control unit. ■

NO—Go to step 3.

3. Connect PCM connector E (12P).

4. Start the engine.

(cont'd)

BACK

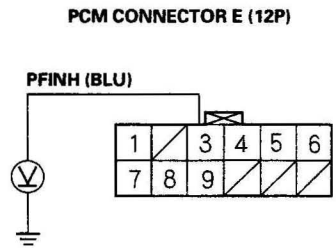
Protected by AR

DTC Troubleshooting (cont'd)

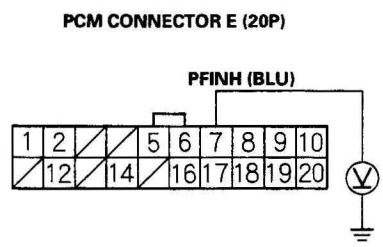
5. Measure the voltage between the PCM connector E terminal No. 3 ('99 model) or No. 7 ('00-03 models) and body ground.

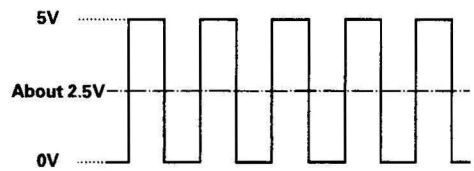
   NOTE: Use the 10 V range or similar range in an analog tester.

   '99 model:



   '00-03 models:



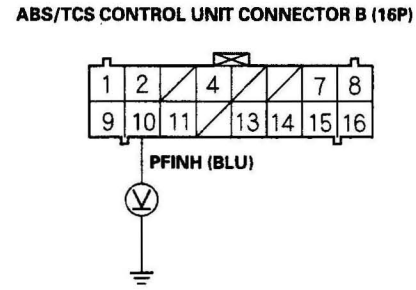


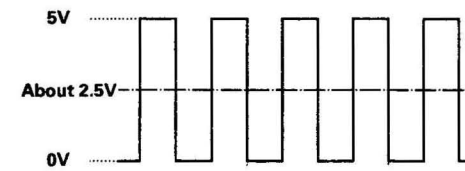
Is there about 2.5 V?

YES – Go to step 6.

NO – Check for loose PCM connectors. If necessary, substitute a known-good PCM, and recheck. ■

6. With an analog voltmeter set to the 10 V or similar range, measure the voltage between the ABS/TCS control unit connector B (16P) terminal No. 10 and body ground.





Is there about 2.5 V?

YES – Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck. ■

NO – Repair open in the wire between the PCM and the ABS/TCS control unit. ■

BACK

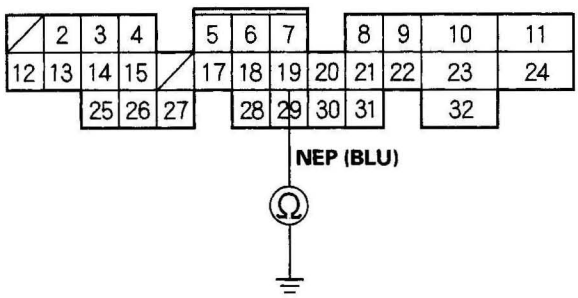
Protected by AR

TCS DTC 32: Engine speed (NEP) Signal

NOTE: If the MIL or ABS indicator is ON, troubleshoot the PGM-FI or ABS first.

1. Disconnect PCM connector A (32P) and ABS/TCS control unit connector B (16P).
2. Check for continuity between PCM connector A (32 P) terminal No. 19 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals

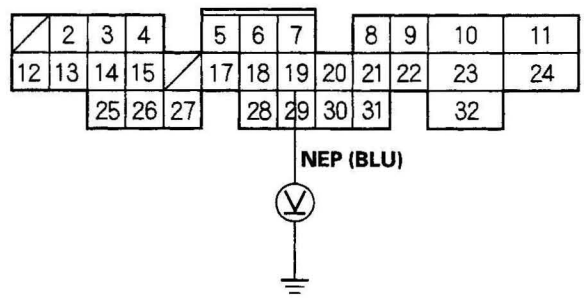
Is there continuity?

YES – Repair short to body ground in the wire between the PCM and the ABS/TCS control unit.

NO – Go to step 3.

3. Measure the voltage between PCM connector A (32P) terminal No. 19 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there more than 1 V?

YES – Repair short to power in the wire between the PCM and the ABS/TCS control unit. ■

NO – Go to step 4.

4. Connect PCM connetor A (32P).
5. Start the engine, warm it up to normal operating temperature, and let it idle.

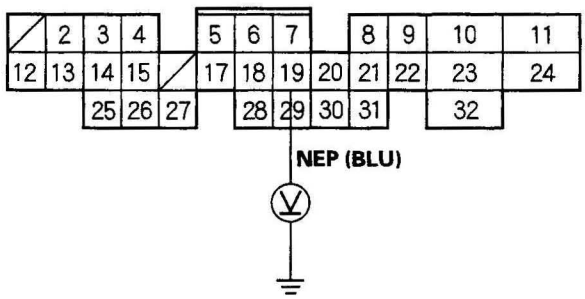
(cont'd)

Protected by AR

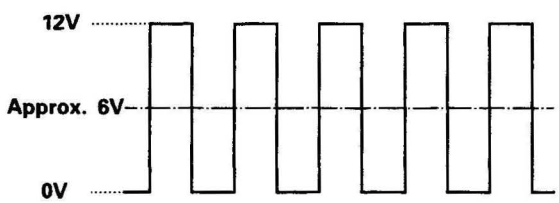
DTC Troubleshooting (cont'd)

6. With an analog voltmeter set to the 10 V or similar range, measure the voltage between PCM connector A (32P) terminal No. 19 and body ground.

PCM CONNECTOR A (32P)



Wire side of female terminals



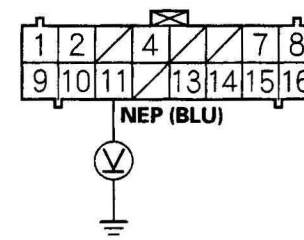
Is there about 6 V?

YES – Go to step 7.

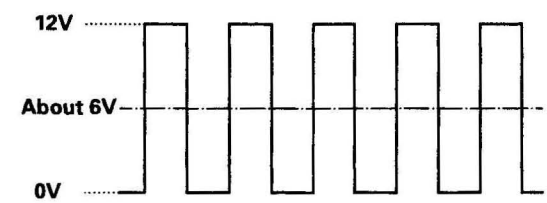
NO – Check for loose PCM connectors. If necessary, substitute a known-good PCM, and recheck. ■

7. With the engine still idling, measure the voltage between ABS/TCS control unit connector B (16P) terminal No. 11 and body ground with the analog voltmeter again.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals



Is there about 6 V?

YES – The system is OK at this time. If the problem recurs, check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck. ■

NO – Repair open in the wire between the PCM and ABS/TCS control unit. ■

BACK

Protected by AR

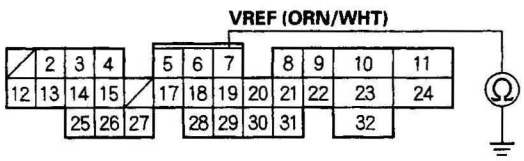
TCS DTC 34: Reference Voltage (VREF) Signal

NOTE: If the MIL or ABS indicator is ON, troubleshoot the PGM-FI or ABS first.

1. Disconnect PCM connector A (32P) ('99 model) or connector E (20P) ('00-03 models) and ABS/TCS control unit connector B (16P).
2. Check for continuity between PCM connector A (32P) terminal No. 7 ('99 model) or connector E (20P) terminal No. 6 ('00-03 models) and body ground.

'99 model:

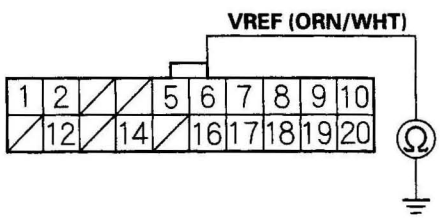
PCM CONNECTOR A (32P)



Wire side of female terminals

'00-03 models:

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there continuity?

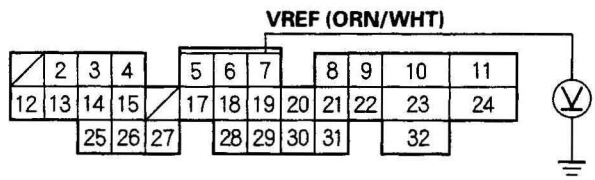
YES – Repair short to body ground in the wire between the PCM and the ABS/TCS control unit. ■

NO – Go to step 3.

3. Connect PCM connector A (32P) ('99 model) or connector E (20P) ('00-03 models).
4. Turn the ignition switch ON (II).
5. Measure the voltage between PCM connector A (32P) terminal No. 7 ('99 model) or connector E (20P) terminal No. 6 ('00-03 models) and body ground.

'99 model:

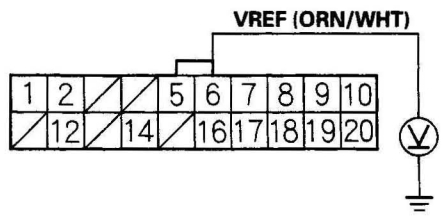
PCM CONNECTOR A (32P)



Wire side of female terminals

'00-03 models:

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there about 5 V?

YES – Go to step 6.

NO – Check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck. ■

(cont'd)

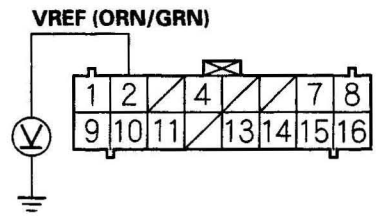
BACK

Protected by AR

DTC Troubleshooting (cont'd)

6. Measure the voltage between the ABS/TCS control unit connector B (16P) terminal No. 2 and body ground.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there about 5 V?

YES—The system is OK at this time. If the problem recurs, replace the ABS/TCS control unit. ■

NO—Repair open in the wire between the PCM and ABS/TCS control unit. ■

TCS DTC 36: Throttle Position Sensor Output (THLOUT) Signal

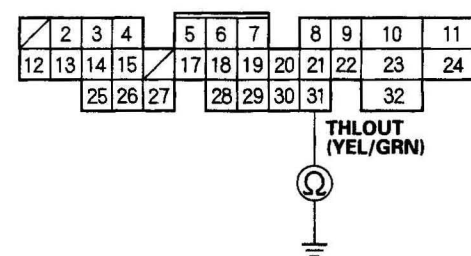
NOTE: If the MIL or ABS indicator is ON, troubleshoot the PGM-FI or ABS first.

1. Disconnect PCM connector A (32P) ('99 model) or connector E (20P) ('00-03 models) and ABS/TCS control unit connector B (16P).

2. Check for continuity between PCM connector A (32P) terminal No. 31 ('99 model) or connector E (20P) terminal No. 5 ('00-03 models) and body ground.

'99 model:

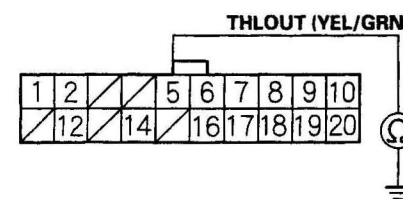
PCM CONNECTOR A (32P)



Wire side of female terminals

'00-03 models:

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between the PCM and the ABS/TCS control unit. ■

NO—Go to step 3.

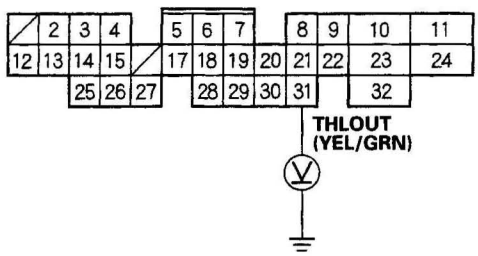
BACK

Protected by AR

3. Measure the voltage between PCM connector A (32P) terminal No. 31 ('99 model) or connector E (20P) terminal No. 5 ('00-03 models) and body ground.

'99 model:

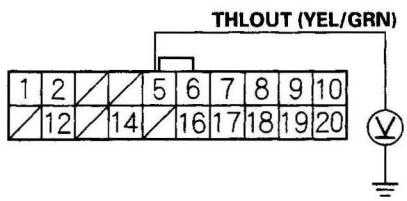
PCM CONNECTOR A (32P)



Wire side of female terminals

'00-03 models:

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there more than 1 V?

YES—Repair short to power in the wire between the PCM and the ABS/TCS control unit.■

NO—Go to step 4.

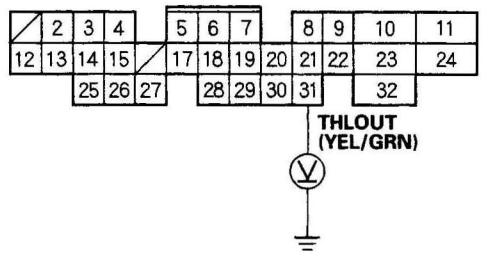
4. Connect PCM connector A (32P) ('99 model) or connector E (20P) ('00-03 models).

5. Turn the ignition switch ON (II), but do not start the engine.

6. Measure the voltage between PCM connector A (32P) terminal No. 31 ('99 model) or connector E (20P) terminal No. 5 ('00-03 models) and body ground with the throttle fully opened and fully colsed. There should be a smooth transition from about 0.5 V and 4.5 V.

'99 model:

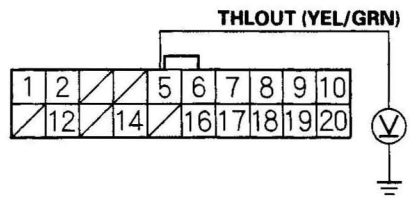
PCM CONNECTOR A (32P)



Wire side of female terminals

'00-03 models:

PCM CONNECTOR E (20P)



Wire side of female terminals

Is the voltage as specified?

YES—Go to step 7.

NO—Check for loose PCM connectors. If necesssary, substitute a known-good PCM, and recheck.■

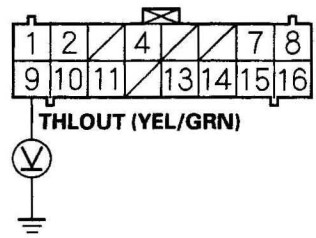
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Measure the voltage between ABS/TCS control unit connector B (16P) terminal No. 9 and body ground with the throttle fully closed.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there about 0.5 V?

YES—The system is OK at this time. If the problem recurs, check for loose ABS/TCS control unit connectors. If necessay, substitute a known-good ABS/TCS control unit, and recheck. ■

NO—Repair open in the wire between the PCM and the ABS/TCS control unit. ■

TCS DTC 61: A/T Shift Position (ATSFTP) Signal

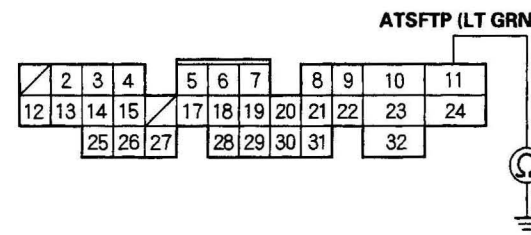
NOTE: If the MIL or ABS indicator is ON, troubleshoot the PGM-FI or ABS first.

1. Disconnect PCM connector A (32P) ('99 model) or connector E (20P) ('00-03 models) and the ABS/TCS control unit connector B (16P).

2. Check for continuity between PCM connector A (32P) terminal No. 11 ('99 model) or connector E (20P) terminal No. 17 ('00-03 models) and body ground.

'99 model:

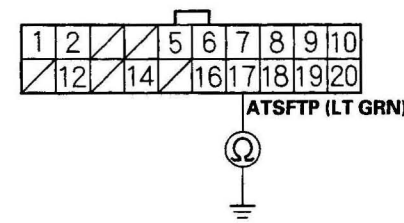
PCM CONNECTOR A (32P)



Wire side of female terminals

'00-03 models:

PCM CONNECTOR E (20P)



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between the PCM, and the ABS/TCS control unit. ■

NO—Go to step 3.

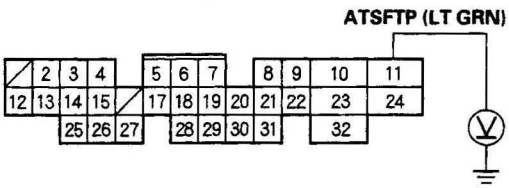
BACK

Protected by AR

3. Measure the volgate between PCM connector A (32P) terminal No. 11 ('99 model) or connector E (20P) terminal No. 17 ('00-03 models) and body ground.

'99 model:

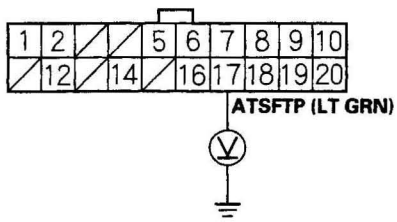
PCM CONNECTOR A (32P)



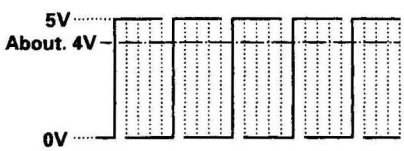
Wire side of female terminals

'00-03 models:

PCM CONNECTOR E (20P)



Wire side of female terminals



Is there battery voltage?

YES—Repair short to power in the wire between the PCM and the ABS/TCS control unit.■

NO—Go to step 4.

4. Connect PCM connector.

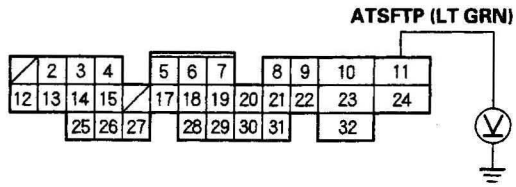
5. Shift the transmission to Ⓟ position.

6. Start the engine.

7. With an analog voltmeter set to the 10 V or similar range, measure the voltage between PCM connector A (32P) terminal No. 11 ('99 model) or connector E (20P) terminal No. 17 ('00-03 models) and body ground.

'99 model:

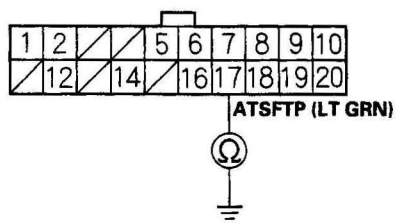
PCM CONNECTOR A (32P)



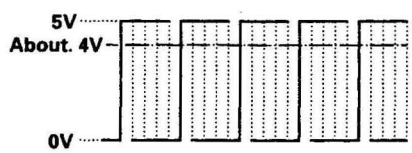
Wire side of female terminals

'00-03 models:

PCM CONNECTOR E (20P)



Wire side of female terminals



Is there about 4 V?

YES—Go to step 8.

NO—Check for loose PCM connectors. If necessary, substitute a known-good PCM, and recheck.■

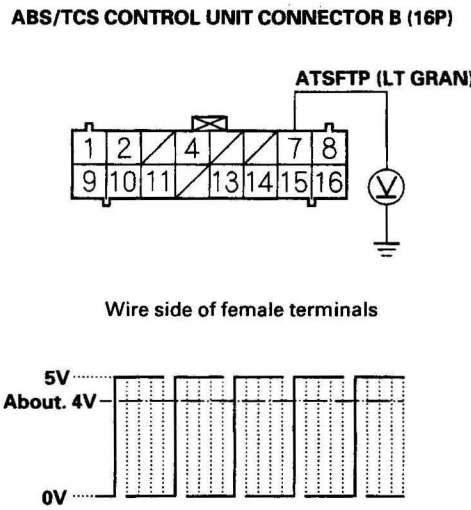
(cont'd)

BACK

Protected by AR

DTC Troubleshooting (cont'd)

8. With an analog voltmeter set to the 10 V or similar range, measure the voltage between ABS/TCS control unit connector B (16P) terminal No. 7 and body ground.



Is there about 4 V?

YES – Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit and recheck. ■

NO – Repair open in the wire between the PCM and the ABS/TCS control unit. ■

TCS DTC 81: Continuous TCS Operation

NOTE: If the MIL or ABS indicator is ON, troubleshoot the PGM-FI or ABS first.

1. Clear the DTC.
2. Test-drive the vehicle.

Does the TCS indicator come on, and is DTC 81 indicated?

YES – Replace the ABS/TCS control unit. ■

NO – Intermittent failure; the vehicle is OK at this time. ■

BACK

Protected by AR

ABS Indicator Circuit Troubleshooting

1. Turn the ignition switch ON (II), and watch the TCS indicator.

   Does the ABS indicator come on?

   YES – If the ABS indicator comes on and goes off, it's OK. If the ABS indicator stays on, go to step 13.

   NO – Go to step 2. ■

2. Turn the ignition switch OFF then ON (II) again.

   Does the brake system indicator come on?

   YES – Go to step 3. ■

   NO – Repair open in the brake system indicator circuit.
   - Blown BACK-UP LIGHT (7.5A) fuse.
   - Open in the wire between the BACK-UP LIGHT (7.5A) fuse and gauge assembly.
   - Open circuit inside the fuse box.

3. Turn the ignition switch OFF.

4. Disconnect ABS/TCS control unit connector A (26P).

5. Turn the ignition switch ON (II).

   Does the ABS indicator come on?

   YES – Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck. ■

   NO – Go to step 6. ■

6. Check the ABS indicator bulb in the gauge assembly.

   Is the bulb OK?

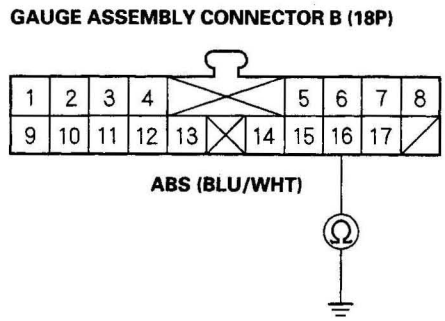
   YES – Go to step 7. ■

   NO – Replace the ABS indicator bulb. ■

7. Turn the ignition switch OFF.

8. Disconnect gauge assembly connector B (18P).

9. Check for continuity between the gauge assembly connector B (18P) terminal No. 16 and body ground.



Wire side of female terminals

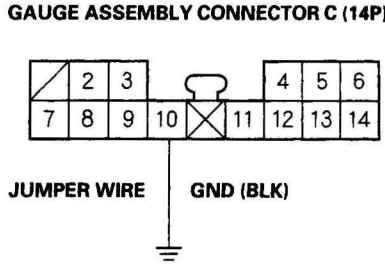
   Is there continuity?

   YES – Repair short to body ground in the wire between the gauge assembly and the ABS/TCS control unit. ■

   NO – Go to step 10.

10. Connect gauge assembly connector B (18P).

11. Connect gauge assembly connector C (14P) terminal No. 10 to body ground with a jumper wire.



Wire side of female terminals

12. Turn the ignition switch ON (II).

    Does the ABS indicator come on?

    YES – Repair open in the wire between the gauge assembly and body ground (G501). ■

    NO – Replace the printed circuit board in the gauge assembly. ■

(cont'd)

Protected by AR

ABS Indicator Circuit Troubleshooting (cont'd)

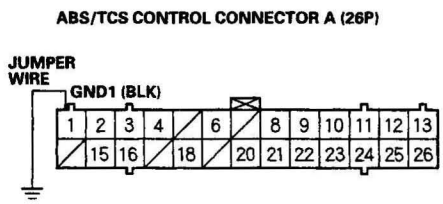
13. Check the R/C MIRROR (7.5A) fuse in the driver's under-dash fuse/relay box, and reinstall the fuse if it is OK.

    Is the fuse OK?

    YES – Go to step 14.

    NO – Replace the fuse and recheck. ■

14. Connect the ABS/TCS control unit connector A (26P) terminal No. 1 to body ground with a jumper wire.



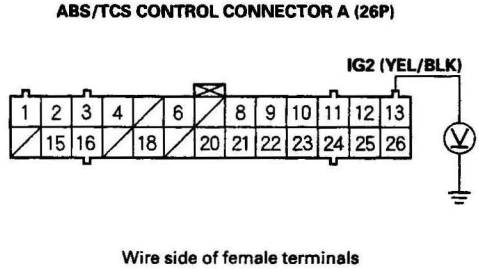
15. Turn the ignition switch ON (II).

    Does the ABS indicator go off?

    YES – Repair open in the wire between the ABS/TCS control unit and body ground (G403). ■

    NO – Go to step 16.

16. Measure the voltage between the ABS/TCS control unit connector A (26P) terminal No. 13 and body ground.

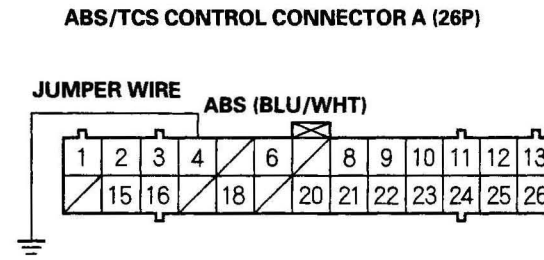


    Is there battery voltage?

    YES – Go to step 17.

    NO – Repair open in the wire between the R/C MIRROR (7.5A) fuse and ABS/TCS control unit. ■

17. Connect the ABS/TCS control unit connector A (26P) terminal No. 4 to body ground with a jumper wire.

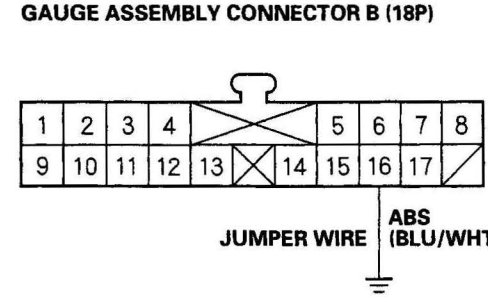


    Does the ABS indicator go off?

    YES – Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck. ■

    NO – Go to step 18.

18. Connect the gauge assembly connector B (18P) terminal No. 16 to body ground with a jumper wire.



    Does the ABS indicator go off?

    YES – Repair open in the wire between the gauge assembly and the ABS/TCS control unit. ■

    NO – Replace the printed circuit board in the gauge assembly. ■

BACK

Protected by AR

TCS Indicator Circuit Troubleshooting

1. Start the engine, and watch the TCS indicator.

   Does the TCS indicator come on?

   YES – If the TCS indicator comes on and goes off, it's OK. If the TCS indicator stays on, go to step 7.

   NO – Go to step 2.

2. Turn the engine OFF, then restart it again.

   Does the brake system indicator come on?

   YES – Go to step 3.

   NO – Repair open in the brake system indicator circuit. ■
   - Blown BACK-UP LIGHT (7.5A) fuse.
   - Open in the wire between the BACK-UP LIGHT (7.5A) fuse and gauge assembly.
   - Open circuit inside the fuse box.

3. Turn the engine OFF, and check the TCS indicator bulb in the gauge assembly.

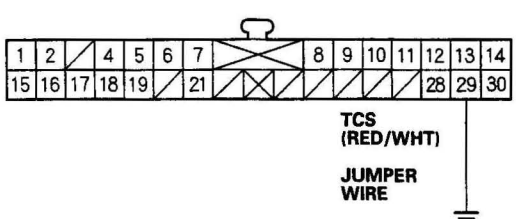
   Is the bulb OK?

   YES – Go to step 4.

   NO – Replace the TCS indicator bulb. ■

4. Connect the gauge assembly connector A (30P) terminal No. 29 and body ground with a jumper wire. Turn the ignition switch ON (II).

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

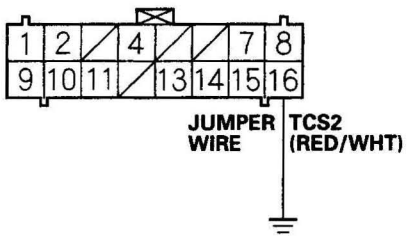
Does the TCS indicator come on?

YES – Go to step 5.

NO – Replace the printed circuit board in the gauge assembly. ■

5. Remove the jumper wire at the gauge assembly, and connect the ABS/TCS control unit connector B (16P) terminal No. 16 and body ground with a jumper wire.

ABS/TCS CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

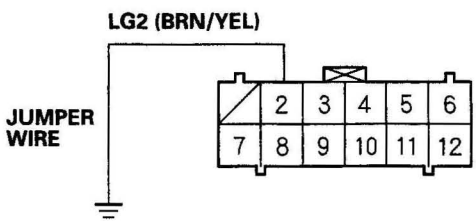
Does the TCS indicator come on?

YES – Go to step 6.

NO – Repair open in the wire between the gauge assembly and the ABS/TCS control unit. ■

6. Connect the ABS/TCS control unit connector C (12P) terminal No. 2 and body ground with a jumper wire.

ABS/TCS CONTROL UNIT CONNECTOR C (12P)



Wire side of female terminals

Does the TCS indicator come on?

YES – Repair open in the wire between the ABS/TCS control unit and body ground (G101). ■

NO – Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck. ■

(cont'd)

Protected by AR

TCS Indicator Circuit Troubleshooting (cont'd)

7. Check the R/C MIRROR (7.5A) fuse in the driver's under-dash fuse/relay box, and reinstall the fuse if it is OK.

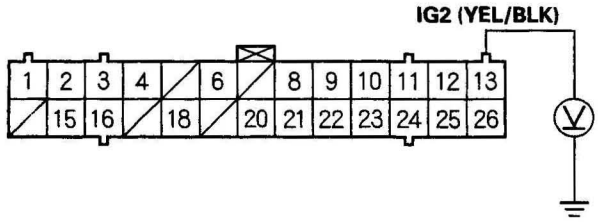
   Is the fuse OK?

   YES – Go to step 8.

   NO – Replace the fuse, and recheck. ■

8. Measure the voltage between the ABS/TCS control unit connector A (26P) terminal No. 13 and body ground.

   ABS/TCS CONTROL CONNECTOR A (26P)



   Wire side of female terminals

   Is there battery voltage?

   YES – Go to step 9.

   NO – Repair open in the wire between the driver's under-dash fuse/relay box and ABS/TCS control unit. ■

9. Turn the ignition switch OFF.

10. Disconnect ABS/TCS control unit connector A (26P) and connector B (16P).

11. Turn the ignition switch ON(II).

    Does the TCS indicator go off?

    YES – Check for loose ABS/TCS control unit connectors. If necessary, substitute a known-good ABS/TCS control unit, and recheck. ■

    NO – Repair short to body ground in the wire between the gauge assembly and the ABS/TCS control unit. ■

BACK

Protected by AR

Modulator Unit Removal and Installation

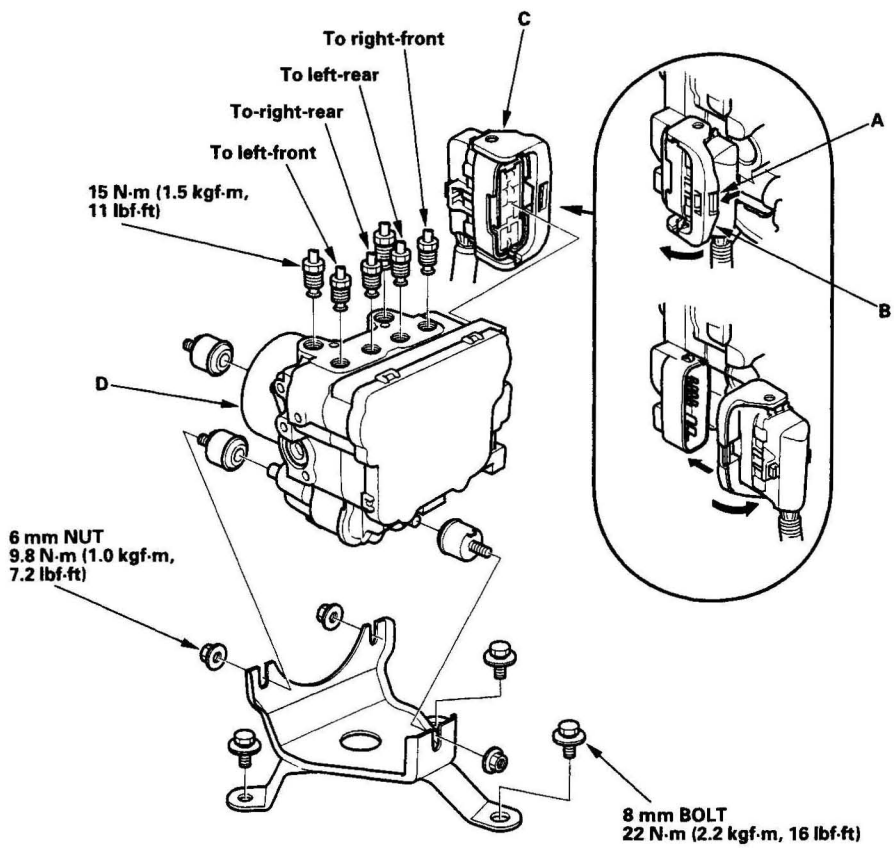
NOTE:
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- Take care not to damage or deform the brake lines during removal and installation.
- To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.

Removal

1. Push the modulator unit connector lock (A), and turn the connector lever (B).
2. Disconnect the modulator unit connector (C).
3. Disconnect the brake lines, then remove the modulator unit (D).

Installation

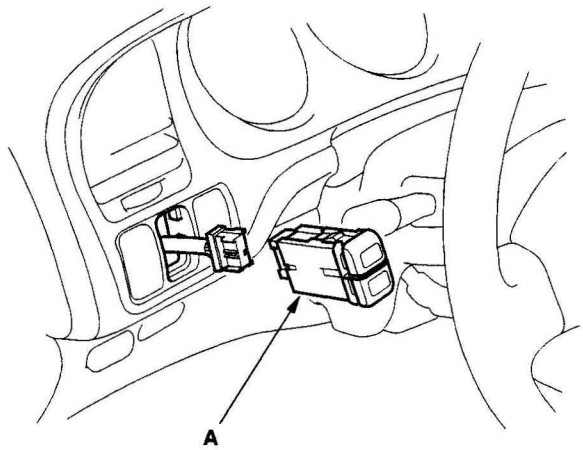
1. Install the modulator unit in the reverse order of removal.
2. Bleed the brake system, starting with the front wheels.
3. Start the engine, and check that the ABS indicator and TCS indicator go off.
4. Test-drive the vehicle, and check that the ABS indicator and TCS indicator do not come on.



Protected by AR

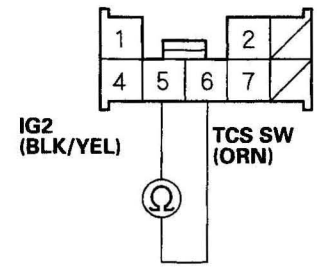
TCS Switch Test

1. Remove the cruise control/TCS switch (A) from the switch panel.



2. Check for continuity between terminal No. 5 and No. 6. There should be continuity when the TCS switch is pushed.

CRUISE CONTROL/TCS SWITCH CONNECTOR



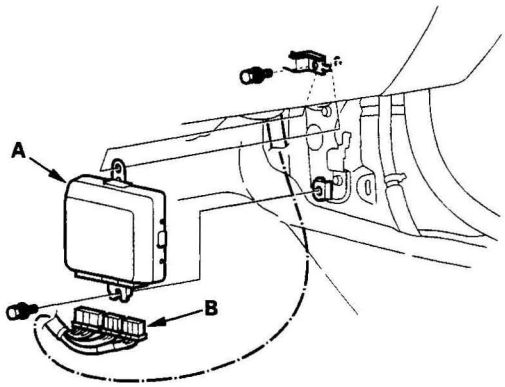
Wire side of female terminals

BACK

Protected by AR

ABS/TCS Control Unit Replacement

1. Remove the passenger's side kick panel.
2. Remove the ABS/TCS control unit (A).



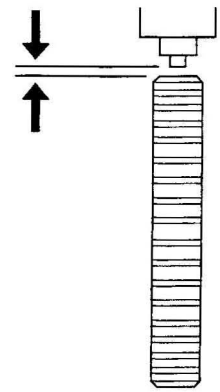
3. Disconnect ABS/TCS control unit connectors (B).
4. Install the ABS/TCS control unit in the reverse order of removal.

Wheel Sensor Inspection

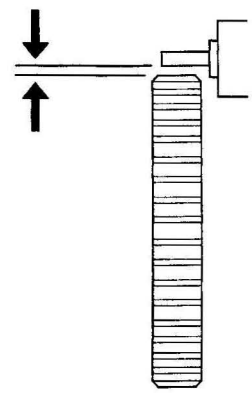
1. Inspect the front and rear pulsers for chipped or damaged teeth.
2. Measure the air gap between the wheel sensor and pulser all the way around while rotating the pulser. Remove the rear brake disc to measure the gap on the rear wheel sensor. If the gap exceeds 1.0 mm (0.04 in), check for a bent suspension arm.

Standard: 0.4—1.0 mm (0.02—0.04 in)

Front



Rear



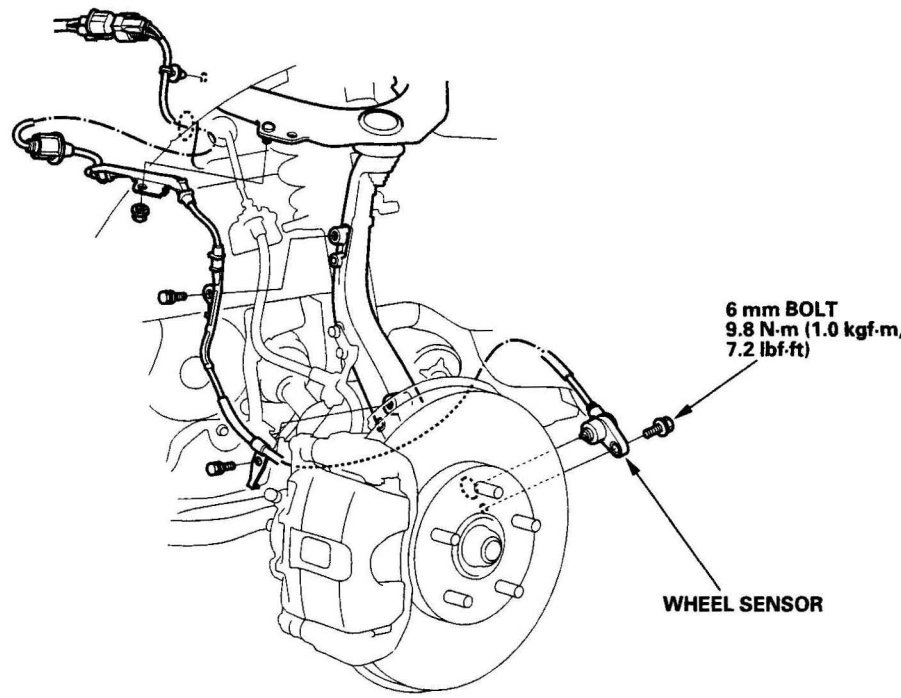
BACK

Protected by AR

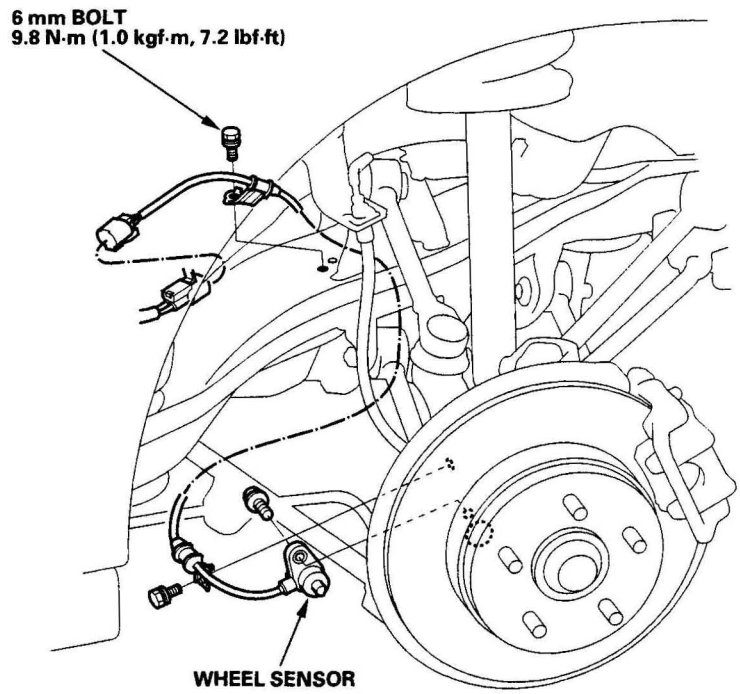
Wheel Sensor Replacement

Install the sensors carefully to avoid twisting wires.

Front



Rear



BACK

Protected by AR

Brakes

Conventional Brake System 19-1

ABS/TCS (Anti-lock Brake System/ Traction Control System) Components 19-35

VSA (Vehicle Stability Assist) System Components

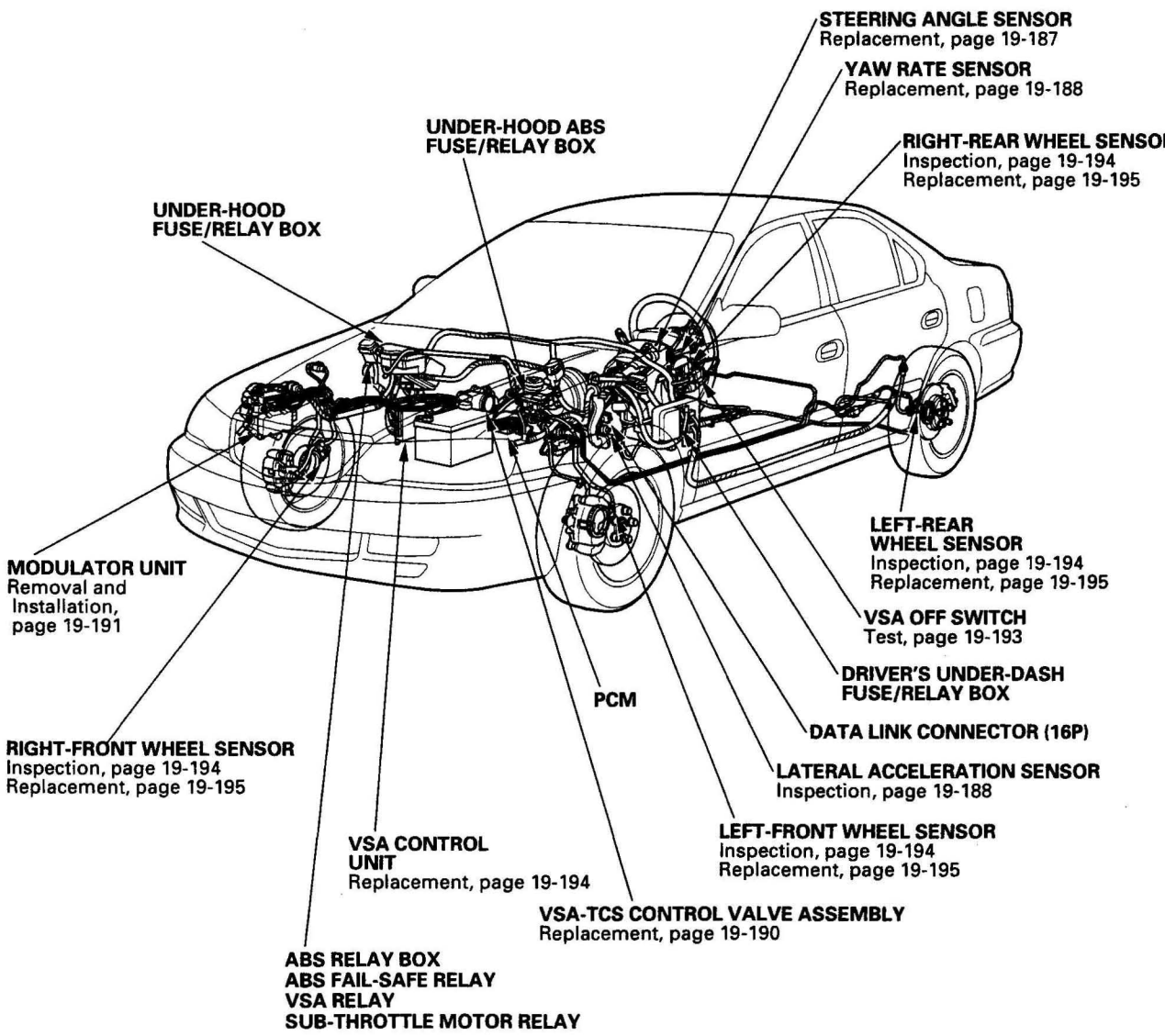
Component Location Index 19-108
General Troubleshooting Information 19-109
DTC Troubleshooting Index 19-113
Symptom Troubleshooting Index 19-114
System Description 19-115
Circuit Diagram 19-132
DTC Troubleshooting 19-134
ABS Indicator Circuit Troubleshooting 19-179
VSA System Indicator Circuit Troubleshooting 19-182
VSA Activation Indicator Circuit Troubleshooting 19-184
Steering Angle Sensor Replacement 19-187
Yaw Rate Sensor Replacement 19-188
Lateral Acceleration Sensor Inspection 19-188
Neutral Position Memorization 19-189
VSA-TCS Control Valve Assembly Replacement 19-190
Modulator Unit Removal and Installation 19-191
VSA Modulator Fluid Replacement 19-192
VSA Off Switch Test 19-193
VSA Control Unit Replacement 19-194
Wheel Sensor Inspection 19-194
Wheel Sensor Replacement 19-195



Protected by AR

VSA System Components

Component Location Index



BACK

Protected by AR

General Troubleshooting Information

System Indicatorsc

- If the system is OK, the ABS indicator goes off 2 seconds after turning the ignition switch ON (II).
- The ABS indicator or VSA system indicator comes on when the VSA control unit detects a problem in the system.
- The ABS indicator or VSA system indicator will also come on under these conditions, even though the system is operating properly:
  - The vehicle goes into a spin
  - The ABS continues to operate for a long time
  - The vehicle is subjected to an electrical signal disturbance
- If the VSA off switch is pushed, or if there is a fault in one or more of these components, only the VSA system indicator comes on:
  - Yaw rate sensor, lateral acceleration sensor, steering angle sensor, apply/dump solenoids, modulator unit, PGM-FI communication, neutral position, TCS control valve sensor, TCS control valve actuator.
  - Heated oxygen sensor, manifold absolute pressure sensor, crankshaft position sensor, engine coolant temperature sensor, throttle position sensor, top dead center sensor, top dead center sensor 2, intake air temperature sensor, exhaust gas recirculation, barometric pressure, idle air control valve, VTEC pressure switch, knock sensor, fuel supply system, automatic transmission, misfire detection system of the PGM-FI system.
- The VSA activation indicator will flash when only the drive wheels rotate, one of the drive wheels is stuck, or if the system detects an understeer or oversteer condition.

To determine the actual cause of the problem, question the customer about the problem, taking these conditions into consideration.

- When a problem is detected, and the ABS or VSA system indicator comes on, there are cases when the indicator stays on until the ignition switch is turned OFF, and cases when the indicator goes off automatically when the system returns to normal. For DTCs 61 and 62, the indicator goes off automatically when the system returns to normal. For all other codes, the indicator stays on until the ignition switch is turned OFF.
- For DTCs 12, 14, 16, 18, 21, 22, 23, 24, 41, 42, 43, 44, 51, and 52, the ABS indicator goes off when the vehicle is driven again and the system is OK after the ignition switch is turned from OFF to ON (II). However, if the DTC is cleared, the CPU resets, and the indicator goes off right after the engine is started if the system is OK.
- The ABS is not operational when the ABS indicator is ON; the VSA is not operational when the VSA system indicator is ON.
- When the VSA system indicator and MIL are both ON, troubleshoot the PGM-FI system first.

Diagnostic Trouble Code (DTC)

- All of the VSA DTCs are indicated by the ABS indicator blinking.
- The memory can hold any number of DTCs. However, when the same DTC is detected more than once, the more recent DTC is written over the earlier one. Therefore, when the same problem is detected repeatedly, it is memorized as a single DTC.
- The DTCs are indicated in ascending number order, not in the order that they occur.
- The DTCs are memorized in the EEPROM (non-volatile memory). Therefore, the memorized DTCs cannot be canceled by disconnecting the battery. Perform the specified procedures to clear the DTCs.

Self-diagnosis

- Self-diagnosis can be classified into two categories:
  - Initial diagnosis: Done right after the engine starts and until the ABS or VSA system indicator goes off.
  - Regular diagnosis: Done right after the initial diagnosis until the ignition switch is turned OFF.
- When a problem is detected by self-diagnosis, the VSA control unit shifts to fail-safe mode.

Kickback

The pump motor operates when the ABS is functioning, and the fluid in the reservoir is forced out to the master cylinder, causing kickback at the brake pedal.

Pump Motor

- The pump motor operates when the ABS or VSA is functioning.
- The VSA control unit checks the pump motor operation during initial diagnosis when the vehicle starts moving. You may hear the motor operate at this time, but it is normal.
- The pump runs at 7 mph and again at 15 mph.

Brake Fluid Replacement/Air Bleeding

Brake fluid replacement and air bleeding procedures are identical to the procedures used on vehicles not equipped with ABS/VSA. To ease bleeding, start with the front wheels. Replace the VSA fluid in the modulator reservoir after replacing the brake fluid.

(cont'd)

Protected by AR

General Troubleshooting Information (cont'd)

How to Troubleshoot DTCs

The troubleshooting flowchart procedures assume that the cause of the problem is still present and the ABS and/or VSA system indicator is still on. Following the flowchart when the ABS and/or VSA system indicator does not come on can result in incorrect diagnosis. The connector illustrations show the female terminal connectors with a single outline and the male terminal connectors with a double outline.

1. Question the customer about the conditions when the problem occured, and try to reproduce the same conditions for troubleshooting. Find out when the ABS and/or VSA system indicator came on, such as during ABS control, after ABS control, what the vehicle speed was, etc.

2. When the ABS or VSA system indicator does not come on during the test drive, but troubleshooting is performed based on the DTC, check for loose connectors, poor contact of the terminals, etc. before you start troubleshooting.

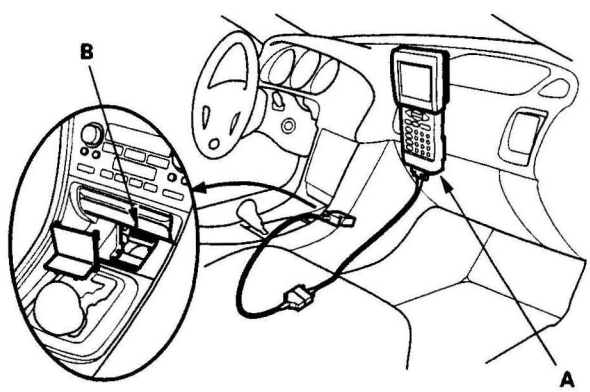
3. After troubleshooting, clear the DTCs and test-drive the vehicle. Make sure the ABS and VSA system indicators do not come on.

How to Retrieve DTCs

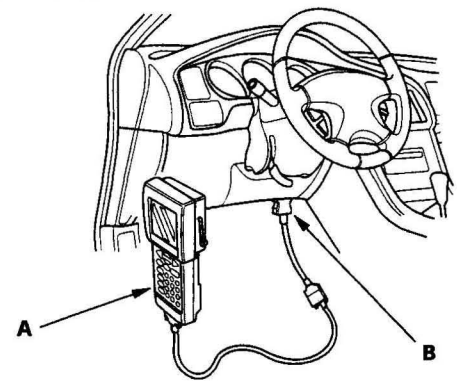
Honda PGM Tester Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind the driver's dashboard lower cover ('03 model).

'99-02 models:



'03 model:



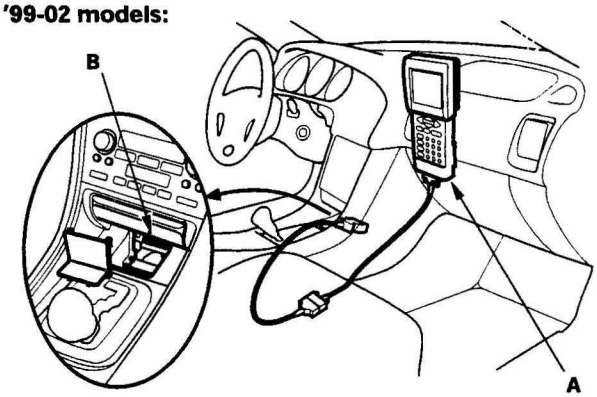
2. Turn the ignition switch ON (II), and follow the prompts on the Honda PGM Tester to display the DTC(s) on the screen. After determining the DTC, refer to the DTC Troubleshooting Index.

   NOTE: See the Honda PGM Tester user's manual for specific instructions.

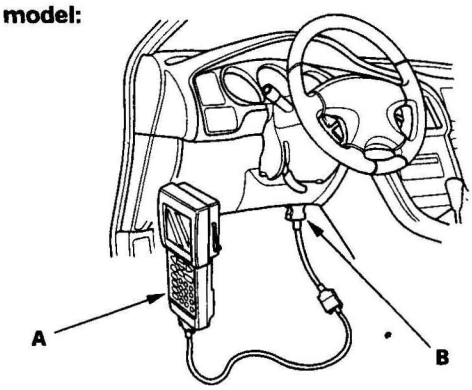
Service Check Signal Circuit Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind the driver's dashboard lower cover ('03 model).

'99-02 models:



'03 model:



BACK

Protected by AR

2. Short the SCS circuit to body ground using the Honda PGM Tester.

3. Turn the ignition switch ON (II) without pressing the brake pedal.

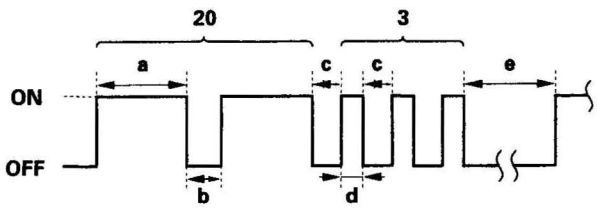
   NOTE: If the brake pedal is pressed when turning the ignition switch ON (II), the system shifts to the DTC clearing mode.

4. The ABS indicator will blink. The blinking frequency indicates the DTC.

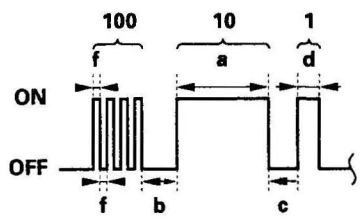
   NOTE: If the DTC is not memorized, the ABS indicator will go off for 3.6 seconds, and then come back on.

   The system will not indicate the DTC unless these conditions are met:
   - The brake pedal is not pressed.
   - The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).
   - The ignition switch is turned ON (II).

Example of DTC 23



Example of DTC 111



a: 1.3 sec. **d: 0.3 sec.**
b: 0.5 sec. **e: 3.6 sec.**
c: 0.4 sec. **f : 0.1 sec.**

5. Turn the ignition switch OFF.

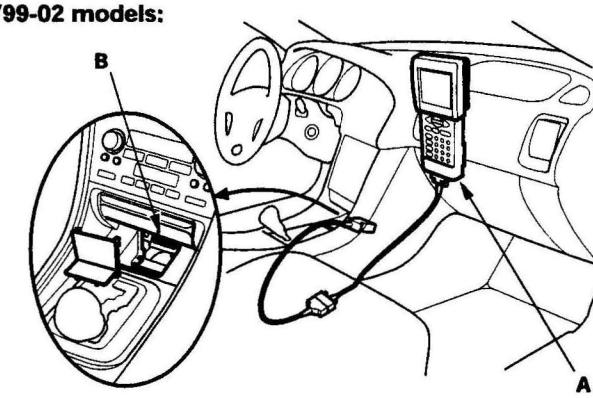
6. Disconnect the Honda PGM Tester from the DLC.

How to Clear DTCs

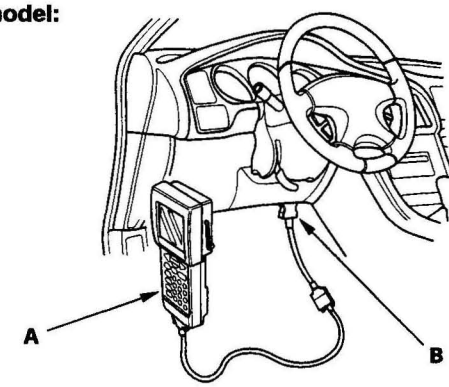
Honda PGM Tester Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind the drivers dashboard lower cover ('03 model).

'99-02 models:



'03 model:



2. Turn the ignition switch ON (II), and clear the DTC(s) by following the screen prompts on the Honda PGM Tester.

   NOTE: See the Honda PGM Tester user's manual for specific instructions.

(cont'd)

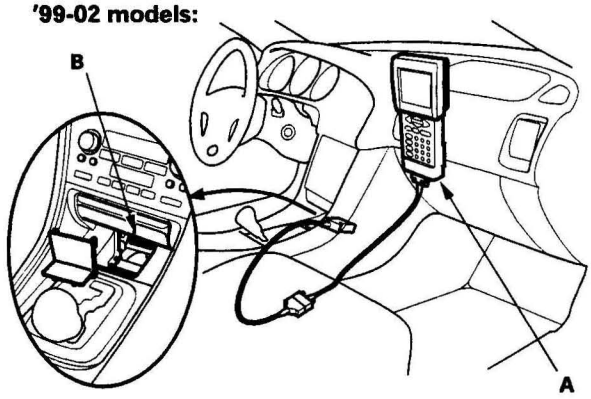
Protected by AR

General Troubleshooting Information (cont'd)

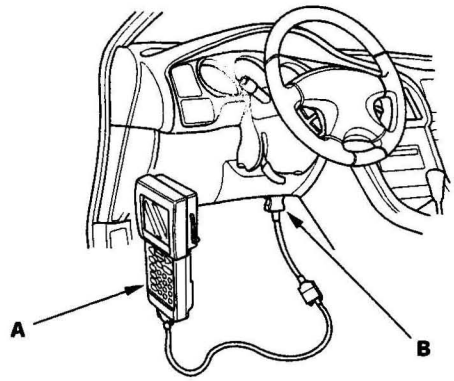
Service Check Signal Circuit Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) located under the ashtray ('99-02 models) or behind the driver's dashboard lower cover ('03 model).

'99-02 models:

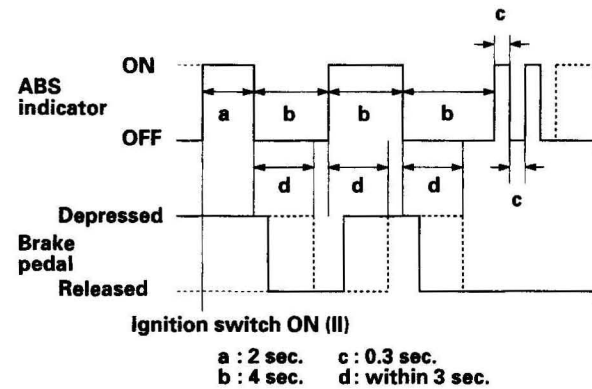


'03 model:



2. Short the SCS circuit body ground using the Honda PGM Tester.
3. Press the brake pedal.
4. Turn the ignition switch ON (II) while keeping the brake pedal pressed.
5. After the ABS indicator goes off, release the brake pedal.
6. After the ABS indicator comes on, press the brake pedal again.
7. After the ABS indicator goes off, release the brake pedal again.

   You cannot clear the DTC unless these conditions are met:
   - The vehicle speed is 6 mph (10 km/h) or less.
   - The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).
   - The brake pedal is pressed before the ignition switch is turned ON (II).



8. After a few seconds, the ABS indicator blinks twice and the DTC is cleared. If the indicator does not blink twice, repeat steps 1 through 7. If the indicator stays on after the indicator blinks twice, check the DTC because a problem was detected during initial diagnosis before shifting to DTC clearing mode.
9. Turn the ignition switch OFF.
10. Disconnect the Honda PGM Tester from the DLC.
11. Do the neutral position memorization (see page 19-189).

BACK

Protected by AR

DTC Troubleshooting Index

DTC	Detection Item	Note
11	Right-front wheel sensor (open/short to body ground/short to power)	(see page 19-134)
12	Right-front wheel sensor (electrical noise/intermittent interruption)	(see page 19-136)
13	Left-front wheel sensor (open/short to body ground/short to power)	(see page 19-134)
14	Left-front wheel sensor (electrical noise/intermittent interruption)	(see page 19-136)
15	Right-rear wheel sensor (open/short to body ground/short to power)	(see page 19-134)
16	Right-rear wheel sensor (electrical noise/intermittent interruption)	(see page 19-136)
17	Left-rear wheel sensor (open/short to body ground/short to power)	(see page 19-134)
18	Left-rear wheel sensor (electrical noise/intermittent interruption)	(see page 19-136)
21	Right-front pulser	(see page 19-137)
22	Left-front pulser	(see page 19-137)
23	Right-rear pulser	(see page 19-137)
24	Left-rear pulser	(see page 19-137)
25	Yaw rate sensor	(see page 19-138)
26	Lateral acceleration sensor	(see page 19-141)
27	Steering angle sensor	(see page 19-143)
31	Right-front inlet solenoid	(see page 19-146)
32	Right-front outlet solenoid	(see page 19-146)
33	Left-front inlet solenoid	(see page 19-146)
34	Left-front outlet solenoid	(see page 19-146)
35	Right-rear inlet solenoid	(see page 19-146)
36	Right-rear outlet solenoid	(see page 19-146)
37	Left-rear inlet solenoid	(see page 19-146)
38	Left-rear outlet solenoid	(see page 19-146)
41	Right-front wheel lock	(see page 19-150)
42	Left-front wheel lock	(see page 19-150)
43	Right-rear wheel lock	(see page 19-150)
44	Left-rear wheel lock	(see page 19-150)
45	Right-front apply solenoid	(see page 19-151)
46	Right-front dump solenoid	(see page 19-151)
47	Left-front apply solenoid	(see page 19-151)
48	Left-front dump solenoid	(see page 19-151)
51	Motor lock	(see page 19-154)
52	Motor stuck OFF	(see page 19-154)
53	Motor stuck ON	(see page 19-157)
54	Fail-safe relay	(see page 19-159)
55	VSA relay	(see page 19-162)
61	Low ignition voltage	(see page 19-164)
62	High ignition voltage	(see page 19-164)
64	Sensor power source	(see page 19-165)
71	Different diameter tire	(see page 19-167)
72	Modulator unit	(see page 19-167)
81	VSA control unit	(see page 19-168)
83	PGM-FI communication	(see page 19-168)
84	Neutral position	(see page 19-170)
93	Throttle position sensor	(see page 19-171)
94	VSA-TCS control valve sensor	(see page 19-171)
97	VSA-TCS control valve actuator	(see page 19-173)
101	Barometric pressure sensor	(see page 19-177)
111	Sub-throttle motor relay	(see page 19-177)

BACK

Protected by AR

VSA System Components

Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
ABS indicator does not come on	ABS Indicator Circuit Troubleshooting (see page 19-179)	
ABS indicator does not go off and no DTC is stored	ABS Indicator Circuit Troubleshooting (see step 1 on page 19-180)	
VSA system indicator does not come on	VSA System Indicator Circuit Troubleshooting (see page 19-182)	
VSA system indicator does not go off and no DTC is stored	VSA System Indicator Circuit Troubleshooting (see step 1 on page 19-183)	
VSA activation indicator does not come on	VSA Activation Indicator Circuit Troubleshooting (see page 19-184)	
VSA activation indicator does not go off and no DTC is stored	VSA Activation Indicator Circuit Troubleshooting (see step 1 on page 19-186)	

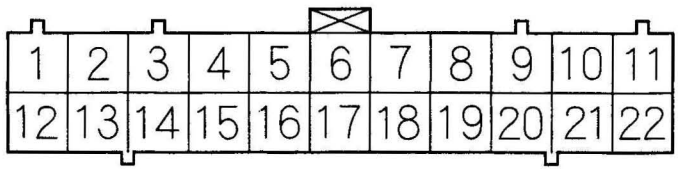
BACK

Protected by AR

System Description

VSA Control Unit Inputs and Outputs for Connector A (22P)

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Measurement		
				Terminal	Conditions (Ignition switch ON (II))	Voltage
1	BLK	GND7	Ground	1-GND	——	Below 0.3 V
2	GRY	TH2	Detects VSA-TCS control valve sensor signal	2-GND	VSA-TCS control valve is fully closed.	About 0.5 V – About 3.7 V
					VSA-TCS control valve is fully open.	
3	RED/GRN	RL-IN	Drives left-rear inlet solenoid valve	3-GND	ABS indicator is OFF.	Battery Voltage
4	RED/BLK	FR-IN	Drives right-front inlet solenoid valve	4-GND		
5	YEL/BLU	FL-OUT	Drives left-front inlet solenoid valve	5-GND		
6	YEL/WHT	RR-OUT	Drives right-rear inlet solenoid valve	6-GND		
7	GRY	FRA	Drives right-front apply solenoid valve	7-GND	VSA system indicator is OFF.	Battery Voltage
8	YEL/GRN	FLA	Drives left-front apply solenoid valve	8-GND		
9	BLU/WHT	ABS	Drives ABS indicator	9-GND	ABS indicator: ON	4 – 6 V
					ABS indicator: OFF	Below 1.0 V
10	YEL	VP	Power source for the VSA-TCS control valve actuator	10-GND	Ignition switch ON (II)	Battery Voltage
11	GRY/WHT	M (+)	Drives VSA-TCS control valve actuator	11-21	VSA is functioning.	0 V
					VSA is not functioning.	Battery Voltage

(cont'd)

BACK

Protected by AR

System Description (cont'd)

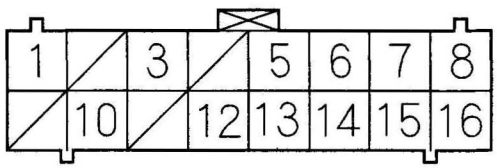
Terminal number	Wire color	Terminal sign	Description	Measurement		
				Terminal	Conditions (Ignition switch ON (II))	Voltage
12	BLK	GND8	Ground	12-GND	———	Below 0.3 V
13	GRN	MCK	Detects pump motor drive signal	13-GND	Pump motor: ON	Battery Voltage
					Pump motor: OFF	Below 0.3 V
					Remove MCK fuse	About 10 V
14	YEL/GRN	RL-OUT	Drives left-rear outlet solenoid valve	14-GND	ABS indicator is OFF.	Battery Voltage
15	YEL/BLK	FR-OUT	Drives right-front outlet solenoid valve	15-GND		
16	RED/BLU	FL-IN	Drives left-front outlet solenoid valve	16-GND		
17	RED/WHT	RR-IN	Drives right-rear outlet solenoid valve	17-GND		
18	LT BLU	FRD	Drives right-front dump solenoid	18-GND	VSA system indicator is OFF.	Battery Voltage
19	RED/GRN	FLD	Drives left-front dump solenoid	19-GND		
20	ORN/WHT	VSA OFF SW	Detects VSA off switch signal	20-GND	VSA off switch: While pressing the switch	Battery Voltage
					VSA off switch: Released	0 V
21	BLU/YEL	M (−)	Drives VSA-TCS control valve actuator	21-11	VSA is functioning.	Battery Voltage
					VSA is not functioning.	0 V
22	BLK	MG	Ground for the motor	22-GND	———	Below 0.3 V

BACK

Protected by AR

VSA Control Unit Inputs and Outputs for Connector B (16P)

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Measurement			
				Terminal	Conditions (Ignition switch ON (II))		Voltage
1	ORN	VSA	Drivers VSA system indicator	1-GND	VSA system indicator	ON	4 – 6 V
						OFF	Below 0.3 V
3	LT BLU	DLC	Communicates with the Honda PGM Tester	———	———		———
5	GRN/RED	PARK	Detects parking brake switch signal	5-GND	With engine running, parking brake	Pressed	Below 0.3 V
						Released	Battery Voltage
6	LT BLU	RLW (+)	Detects left-rear wheel sensor signal	6 – 18 of the connector C (26P)	Wheel	Spin wheel at 1 rev/ second	AC: 0.053 V or above (Reference) Oscilloscope 0.15 Vp-p or above
						Stopped	0.25 V – 1.15 V
7	LT BLU	SVCC	Power source for steering angle sensor, yaw rate sensor, lateral acceleration sensor, VSA-TCS control valve sensor	7-GND	———		About 5 V
8	GRN/YEL	RRW (+)	Detects left-rear wheel sensor signal	8 – 20 of the connector C (26P)	Wheel	Spin wheel at 1 rev/ second	AC: 0.053 V or above (Reference) Oscilloscope 0.15 Vp-p or above
						Stopped	0.25 V – 1.15 V

(cont'd)

BACK

Protected by AR

VSA System Components

System Description (cont'd)

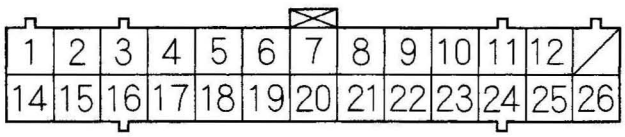
Terminal number	Wire color	Terminal sign	Description	Measurement					
				Terminal	Conditions (Ignition switch ON (II))				Voltage
10	BRN	SCS	Detects service check connector signal (Use for DTC indication)	———	———				———
12	LT GRN	THR	Drives sub throttle motor relay	12-GND	ABS indicator	OFF	VSA indicator	OFF	Below 1.0 V
								ON	Battery Voltage
						ON			Below 0.3 V
13	GRN/BLK	FRW (+)	Detects right-front wheel sensor signal	13—6 of the connector C (26P)	Wheel	Spin wheel at 1 rev/second			AC: 0.053 V or above (Reference) Oscilloscope 0.15 Vp-p or above
						Stopped			0.25 V—1.15 V
14	YEL/RED	PMR	Drives pump motor relay	14-GND	ABS indicator	OFF	Pump motor	ON	Below 1.0 V
								OFF	Battery Voltage
						ON			Below 0.3 V
15	GRN/BLU	FLW (+)	Detects left-front wheel sensor signal	15—4 of the connector C (26P)	Wheel	Spin wheel at 1 rev/second			AC: 0.053 V or above (Reference) Oscilloscope 0.15 Vp-p or above
						Stopped			0.25 V—1.15 V
16	GRN/YEL	VSAR	Drives VSA relay	16-GND	ABS indicator	OFF	VSA indicator	OFF	Below 1.0 V
								ON	Battery Voltage
						ON			Below 0.3 V

BACK

Protected by AR

VSA Control Unit Inputs and Outputs for Connector C (26P)

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Measurement			
				Terminal	Conditions (Ignition switch ON (II))		Voltage
1	BLK/YEL	IG1	Power source for activating the system	1-GND	Ignition switch	ON (II)	Battery Voltage
						Start (II)	Battery Voltage
2	BLK	GND2	Ground	2-GND	———		Below 0.3 V
3	WHT/BLK	STOP	Detects brake switch signal	3-GND	Brake pedal	Pressed	Battery Voltage
						Released	Below 0.3 V
4	BRN	FLW (−)	Detects left-front wheel sensor signal	4−15 of the connector B (16P)	Wheel	Spin wheel at 1 rev/ second	AC: 0.053 V or above (Reference) Oscilloscope 0.15 Vp-p or above
						Stopped	0.25 V−1.15 V
5	GRN/WHT	RYAW	Detects yaw rate sensor signal	5-GND	Vehicle stopped		2.5 V
6	GRN	FRW (−)	Detects right-front wheel sensor signal	6−13 of the connector B (16P)	Wheel	Spin wheel at 1 rev/ second	AC: 0.053 V or above (Reference) Oscilloscope 0.15 Vp-p or above
						Stopped	0.25 V−1.15 V
7	YEL	GLAT	Detects lateral accelleration sensor signal	7-GND	Vehicle stopped		2.5 V
8	YEL/BLU	ACT	Drives VSA activation indicator	8-GND	VSA activation indicator	ON	Below 3 V
						OFF	Battery Voltage
9	RED/YEL	STRA	Detects steering angle sensor signal	9-GND	Turn the steering wheel slowly		5 V−0 V−5 V
10	RED/GRN	SEAF	Communicates with PCM	10-GND	With engine running		About 6 V
11	BLU	NEP	Detects engine speed signal	11-GND	With engine running		About 3 V−6 V
12	BLK	GND4	Ground	12-GND	———		Below 0.3 V

(cont'd)

BACK

Protected by AR

VSA System Components

System Description (cont'd)

Terminal number	Wire color	Terminal sign	Description	Measurement			
				Terminal	Conditions (Ignition switch ON (II))		Voltage
14	BLK	GND1	Ground	14-GND	———		Below 0.3 V
15	YEL/GRN	FSR	Drives fail-safe relay	15-GND	ABS	Warning	Below 0.3 V
						Normal	Battery Voltage
16	BLK	GND3	Ground	16-GND	———		Below 0.3 V
17	BLU/WHT	SDIAG	Detects self-diagnosis signal of steering angle sensor	17-GND	———		About 5 V
18	GRY	RLW (−)	Detects left-rear wheel sensor signal	18−6 of the connector B (16P)	Wheel	Spin wheel at 1 rev/second	AC: 0.053 V or above (Reference) Oscilloscope 0.15 Vp-p or above
						Stopped	0.25 V−1.15 V
19	ORN	RDIAG	Detects self-diagnosis signal of yaw rate sensor	19-GND	———		About 5 V
20	BLU/YEL	RRW (−)	Detects right-rear wheel sensor signal	20−8 of the connector B (16P)	Wheel	Spin wheel at 1 rev/second	AC: 0.053 V or above (Reference) Oscilloscope 0.15 Vp-p or above
						Stopped	0.25 V−1.15 V
21	YEL/RED	STRB	Detects steering angle sensor signal	21-GND	Turns the steering wheel slowly		5 V−0 V−5 V
22	PNK	SEFA	Communicates with PCM	22-GND	With engine running		About 6 V
23	BLK	SLD	Shield for M (+) and M (−) circuits	23-GND	———		Below 0.3 V
24	LT GRN	SG	Ground for steering angle sensor, yaw rate sensor, lateral acceleration sensor, VSA-TCS control valve	24-GND	———		Below 0.3 V
25	BLK	GND5	Ground	25-GND	———		Below 0.3 V
26	BLK	GND6	Ground	26-GND	———		Below 0.3 V

BACK

Protected by AR

Outline

This system consists of the VSA control unit, the modulator unit, four wheel sensors, the VSA-TCS control valve assembly (the VSA-TCS control valve actuator (sub-throttle motor) and the VSA-TCS control valve sensor), the steering angle sensor, the yaw rate sensor, the lateral acceleration sensor, and the PCM. The system integrates the ABS (Anti-lock Brake System), the VSA (Vehicle Stability Assist) system, and the TCS (Traction Control System). The TCS includes brake TCS, engine TCS, and throttle TCS.

(cont'd)

Protected by AR

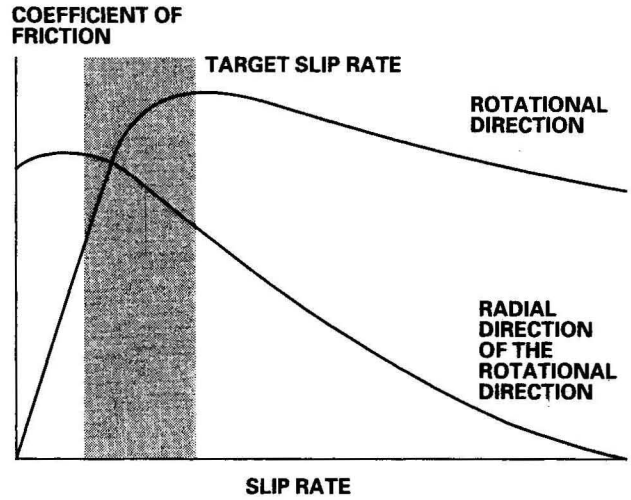
System Description (cont'd)

ABS Features

When the brake pedal is pressed while driving, the wheels can lock before the vehicle comes to a stop. In such an event, the maneuverability of the vehicle is reduced if the front wheels are locked, and the stability of the vehicle is reduced if the rear wheels are locked, creating an extremely unstable condition. The ABS precisely controls the slip rate of the wheels to ensure maximum grip force from the tires, and it thereby ensures maneuverability and stability of the vehicle.

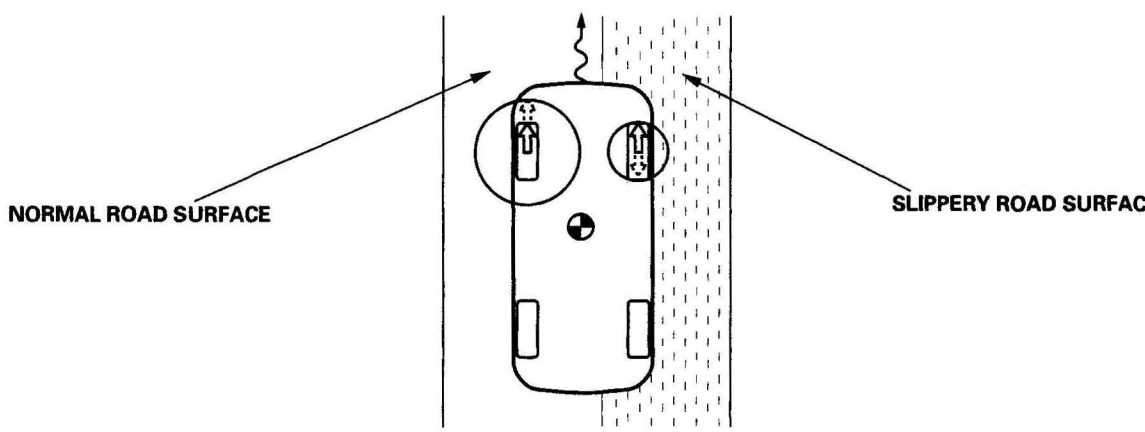
The ABS calculates the slip rate of the wheels based on the vehicle speed and the wheel speed, then it controls the brake fluid pressure to reach the target slip rate.

Grip Force of Tire and Road Surface



TCS Features

The TCS provides low speed traction. When a drive wheel loses traction on a slipperly road surface and starts to spin, the VSA control unit sends a brake signal to the modulator unit, which applies brake pressure to slow the spinning wheel. At that time, the VSA control unit sends a traction control signal to reduce engine power.



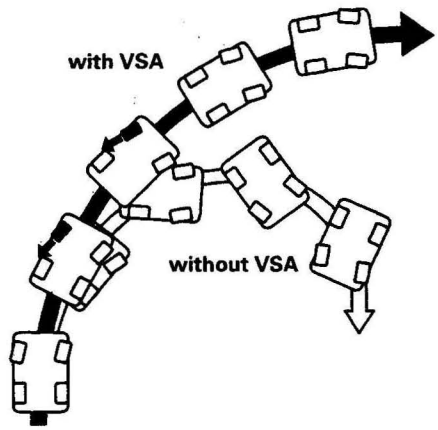
BACK

Protected by AR

VSA System Features

Oversteer control

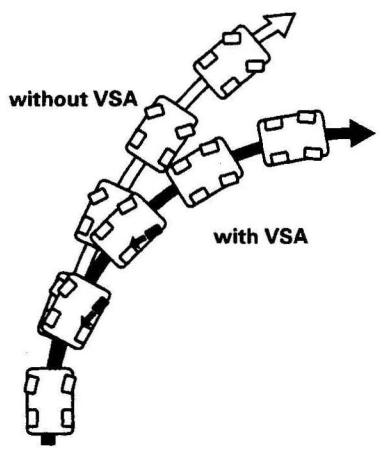
- Applies the brake to the front outside tire



The brake makes the yaw rate opposite to the turning direction

Understeer control (in acceleration)

- Applies the brake to the front inside tire
- Cuts the engine torque by controlling the sub-throttle



The brake increases the yaw rate toward the turning direction

The sub-throttle control effect;
- **reduces vehicle speed**
- **increases cornering force**

(cont'd)

Protected by AR

System Description (cont'd)

Self-Diagnosis

- The VSA control unit is equipped with a main CPU and a sub CPU. Each CPU checks the other for problems.
- The CPU checks the circuit of the system.
- Self-diagnosis can be classified into two categories:
  - Initial diagnosis: Done right after the engine starts and until the ABS or VSA system indicator goes off.
  - Regular diagnosis: Done right after the initial diagnosis until the ignition switch is turned OFF.
- When a problem is detected by self-diagnosis, the VSA control unit shifts to fail-safe mode.

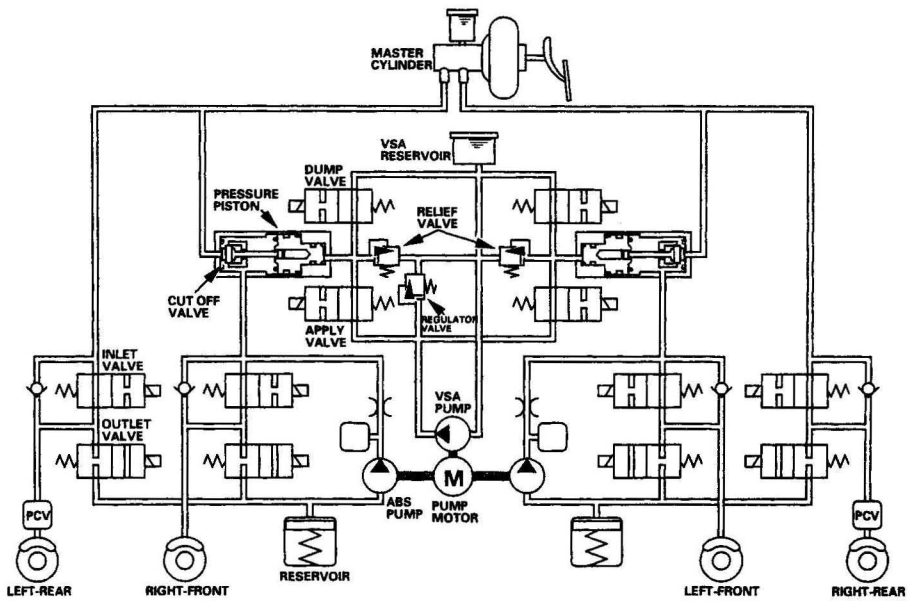
DTC	Detection Item	Detection Timing		Indicators	
		Initial Diagnosis	Regular Diagnosis	ABS	VSA System
11	Right-front wheel sensor (open/short to body ground/short to power)	○	○	ON	ON
12	Right-front wheel sensor (electrical noise/intermittent interruption)		○	ON	ON
13	Left-front wheel sensor (open/short to body ground/short to power)	○	○	ON	ON
14	Left-front wheel sensor (electrical noise/intermittent interruption)		○	ON	ON
15	Right-rear wheel sensor (open/short to body ground/short to power)	○	○	ON	ON
16	Right-rear wheel sensor (electrical noise/intermittent interruption)		○	ON	ON
17	Left-rear wheel sensor (open/short to body ground/short to power)	○	○	ON	ON
18	Left-rear wheel sensor (electrical noise/intermittent interruption)		○	ON	ON
21	Right-front pulser		○	ON	ON
22	Left-front pulser		○	ON	ON
23	Right-rear pulser		○	ON	ON
24	Left-rear pulser		○	ON	ON
25	Yaw rate sensor	○	○	OFF	ON
26	Lateral acceleration sensor	○	○	OFF	ON
27	Steering angle sensor	○	○	OFF	ON
31	Right-front inlet solenoid	○	○	ON	ON
32	Right-front outlet solenoid	○	○	ON	ON
33	Left-front inlet solenoid	○	○	ON	ON
34	Left-front outlet solenoid	○	○	ON	ON
35	Right-rear inlet solenoid	○	○	ON	ON
36	Right-rear outlet solenoid	○	○	ON	ON
37	Left-rear inlet solenoid	○	○	ON	ON
38	Left-rear outlet solenoid	○	○	ON	ON
41	Right-front wheel lock		○	ON	ON
42	Left-front wheel lock		○	ON	ON
43	Right-rear wheel lock		○	ON	ON
44	Left-rear wheel lock		○	ON	ON
45	Right-front apply solenoid	○	○	OFF	ON
46	Right-front dump solenoid	○	○	OFF	ON
47	Left-front apply solenoid	○	○	OFF	ON
48	Left-front dump solenoid		○	OFF	ON
51	Motor lock		○	ON	ON
52	Motor stuck OFF		○	ON	ON
53	Motor stuck ON	○	○	ON	ON
54	Fail-safe relay	○		ON	ON
55	VSA relay	○		ON/OFF	ON
61	Low ignition voltage		○	ON	ON
62	High ignition voltage		○	ON	ON
64	Sensor power source		○	ON	ON
71	Different diameter tire		○	ON/OFF	ON
72	Modulator unit		○	OFF	ON
81	VSA control unit	○	○	ON	ON
83	PGM-FI communication		○	OFF	ON
84	Neutral position		○	OFF	ON
93	Throttle position sensor		○	OFF	ON
94	VSA-TCS control valve sensor	○	○	ON/OFF	ON
97	VSA-TCS control valve actuator	○	○	OFF	ON
101	Barometric pressure sensor		○	OFF	ON
111	Sub-throttle motor relay	○		ON	ON

BACK

Protected by AR

Modulator Unit

The modulator unit consists of the four inlet solenoid valves, four outlet solenoid valves, two front apply valves, two front dump valves, reservoir, relied valves, regulator valve, ABS pump, VSA pump, and pump motor.
The modulator controls the brake fluid pressure directly. It is a circulating-type modulator because the brake fluid circulates through the caliper, the reservoir, and the master cylinder.
The hydraulic control has three modes: pressure intensifying, pressure retaining, and pressure reducing.
The hydraulic circuit is an independent four channel type, one channel for each wheel.



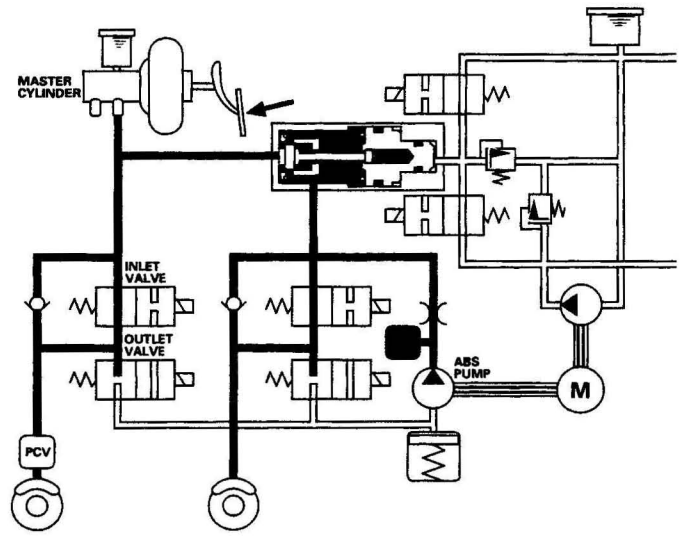
(cont'd)

Protected by AR

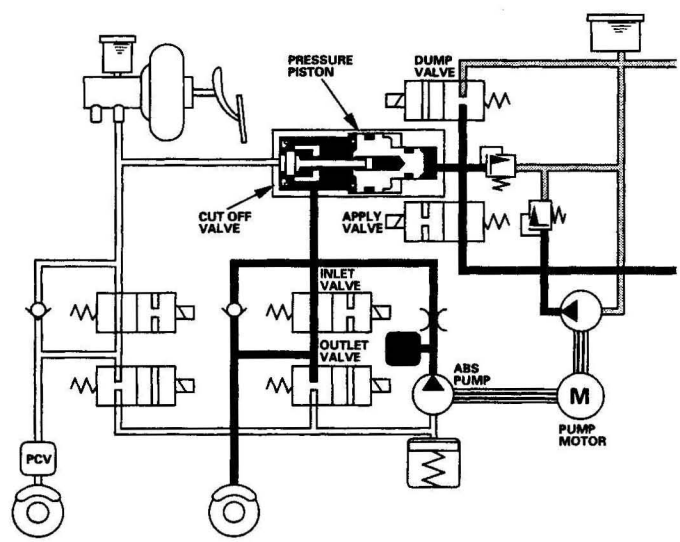
System Description (cont'd)

Modulator Operation

Conventional brake mode
The brake fluid is provided to the brake calipers through four inlet valves. In ABS mode, the VSA control unit drives four inlet valves, four outlet valves, ABS pump, and pump motor the same as conventional ABS.



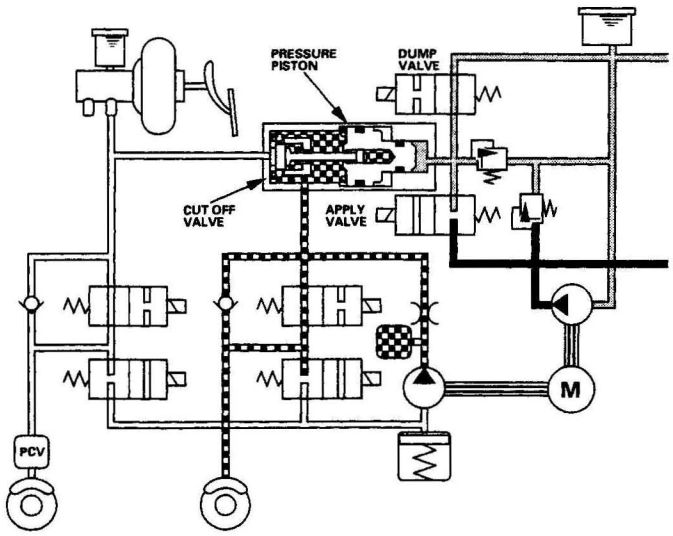
VSA mode (pressure intensifying operation)
In pressure intensifying operation, the apply valve opens, the dump valve closes, and the pump motor operates. The cut off valve is closed by the brake fluid for VSA control pressing on the pressure piston. At the same time, the brake fluid in the pressure chamber provides pressure to the brake caliper.



BACK

Protected by AR

VSA mode (pressure reducing operation)
The VSA control unit opens the dump valve and closes the apply valve. The brake fluid for VSA control is reduced from the pressure chamber to the VSA reservoir. The pressure piston returns to standard position, and the cut off valve opens.



(cont'd)

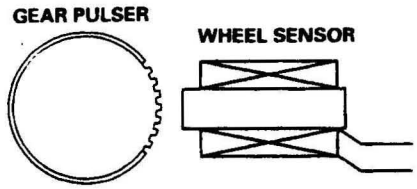
BACK

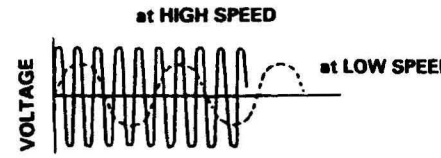
Protected by AR

System Description (cont'd)

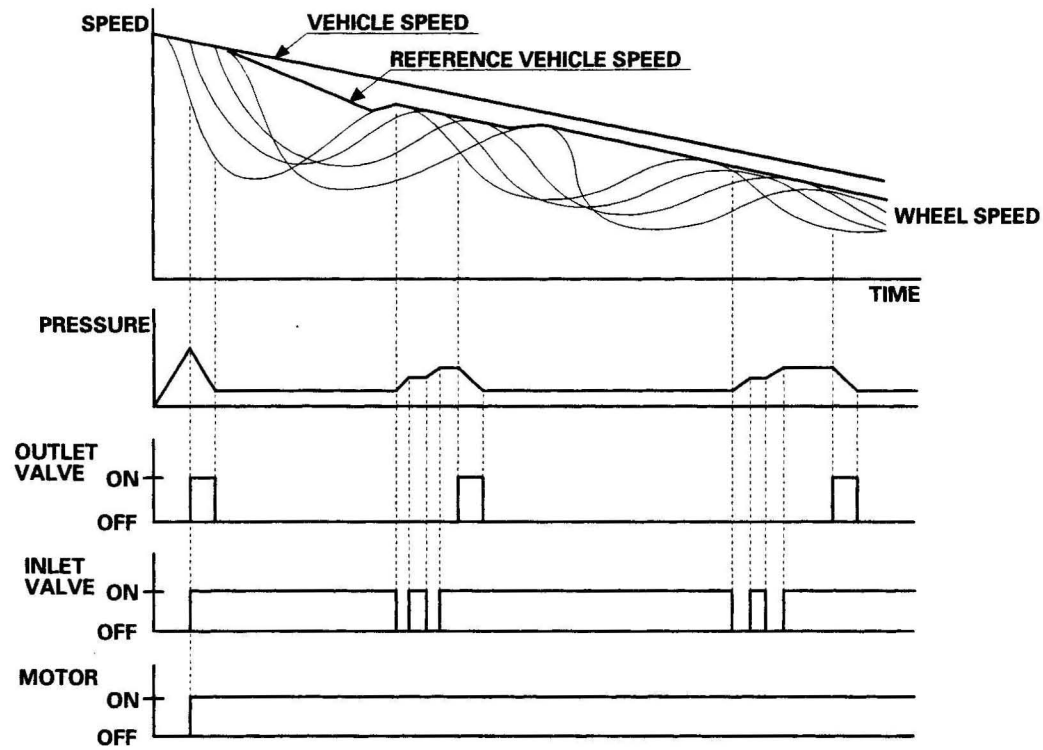
Wheel Sensor

The wheel sensors are the magnetic contactless type. As the gear pulser teeth rotate past the wheel sensor's magnetic coil, AC current is generated. The AC frequency changes in accordance with the wheel speed. The VSA control unit detects the wheel sensor signal frequency and thereby detects the wheel speed.





Wheel Speed and Modulator Control (ABS)



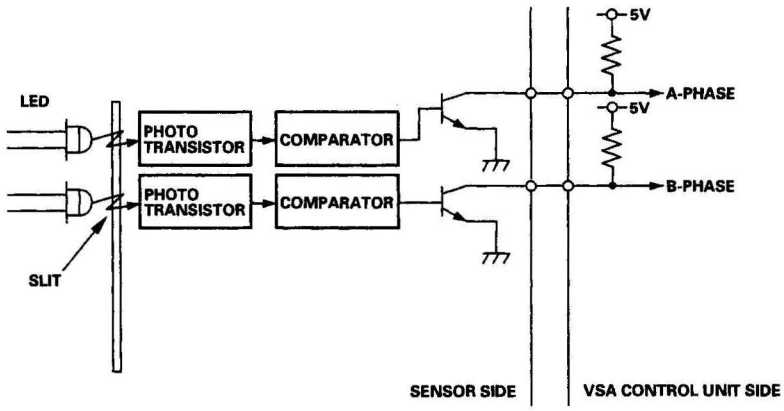
When the wheel speed drops sharply below the vehicle speed, the outlet valve opens momentarily to reduce the caliper fluid pressure. The pump motor starts at this time. As the wheel speed is restored, the inlet valve opens momentarily to increase the caliper fluid pressure.

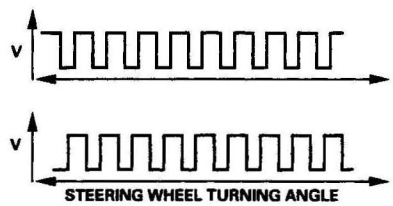
BACK

Protected by AR

Steering Angle Sensor

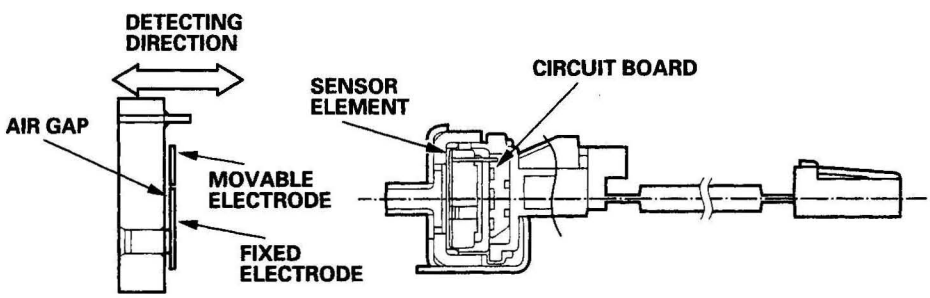
The steering angle sensor detects the steering wheel turning angle. A disk with evenly spaced slits is positioned between the facing parts of a light emitting part (LED), and a light receiving part (photo transistor). As the disk rotates, it interrupts the light from the LED. The light which passes through a slit is converted into the electric current by the photo transister, and the waveform of this electric current is converted by the comparator into a square wave output of the disk's rotation.
The output signal is a 2-phase output (A-phase and B-phase), and the steering wheel turning angle and the turning direction are calculated by the VSA control unit.

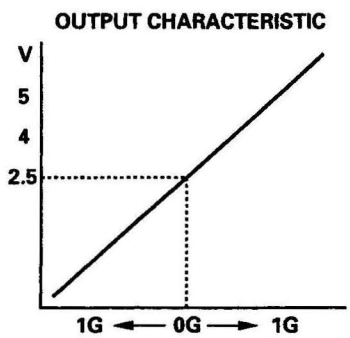




Lateral Acceleration Sensor

The lateral acceleration sensor detects crisscross direction acceleration against the fixed electrode and movable electrode. The sensor is a static-electricity capacity type, and the sensor detects static-electricity between the fixed electrode and movable electrode which is changed by lateral acceleration.





(cont'd)

Protected by AR

System Description (cont'd)

Yaw Rate Sensor

The yaw rate sensor detects the direction change (angular speed) of the vehicle. The sensor is an oscillation gyro.

Sensor Element Structure

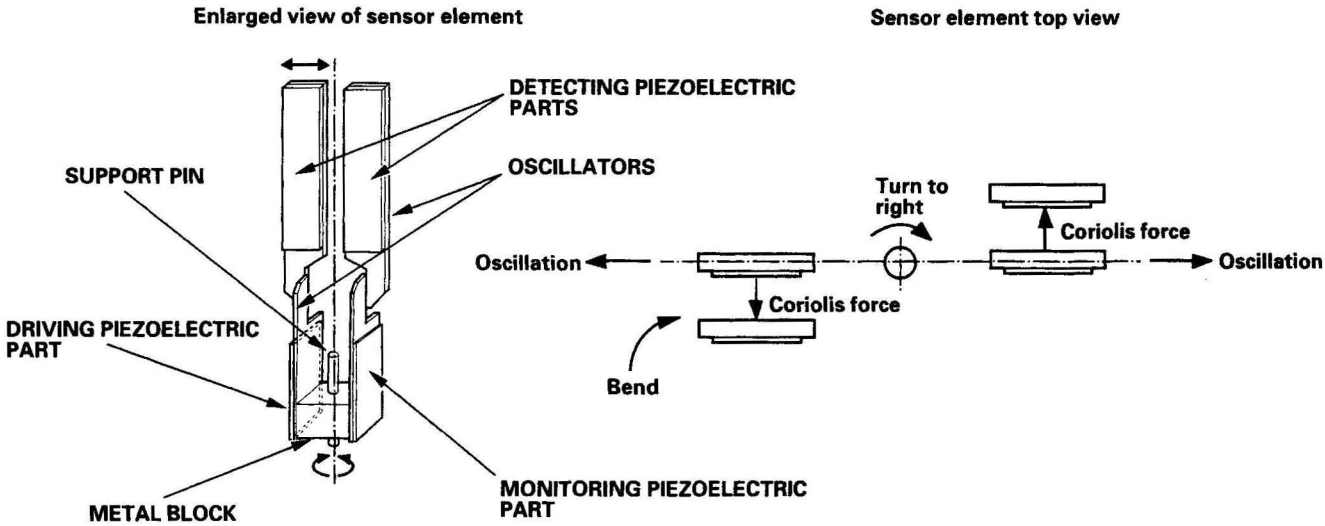
The sensor element is shaped like a tuning fork, and it consists of the piezoelectric parts, the metal block, and the support pin. There are four piezoelectric parts: one to drive the oscillators, one for monitoring that maintains the oscillation at a regular frequency, and two to detect angular velocity. The two oscillators have a 90 degree twist in the center, are connected at the bottom by the metal block, and supported by the support pin. A detecting piezoelectric part is attached to the top of each oscillator. The driving piezoelectric part is attached to the bottom of one oscillator, and the monitoring piezoelectric part is attached to the bottom of the other oscillator.

Oscillation Gyro Principles

The piezoelectric parts have "electric/mechanical transfer characteristics." The piezoelectric parts bend vertically when voltage is applied to both sides of the parts, and voltage is generated between both sides of the piezoelectoric parts when then are bent by an external force. The oscillation gyro fuctions by utilizing this charactoristic of the piezoelectric parts and "Coriolis force." (Coriolis force deflects moving objects as a result of the earth's rotation.) In the oscillation gyro, this force moves the sensor element when the angular velocity is applied.

Operation

1. The driving piezoelectric part oscillates the oscillator by repeatedly bending and returning when an AC voltage at 6 kHz is applied to the part, The monitoring-side oscillator resonates because it is connected to the driving-side oscillator by the metal block.
2. The monitoring piezoelectric parts bend in proportion to the oscillation and outputs voltage (the monitor signal). The VSA control unit control circuit controls the drive signal to stabilize the monitor signal.
3. When the vehicle is stopped, the detecting piezoelectric parts oscillate right and left with the oscillators, but no signal is output because the parts are not bent (no angular force).
4. When the vehicle turns to the right, the sensor element moves in a circular motion with the right oscillator bending forward and the left oscillator bending rearward. The amount of forward/rearward bend varies according to the angular velocity of the vehicle.
5. The detecting piezoelectric parts output voltage (the yaw rate signal) according to the amount of bend. The amount of vehicle direction change is determined by measuring this voltage.

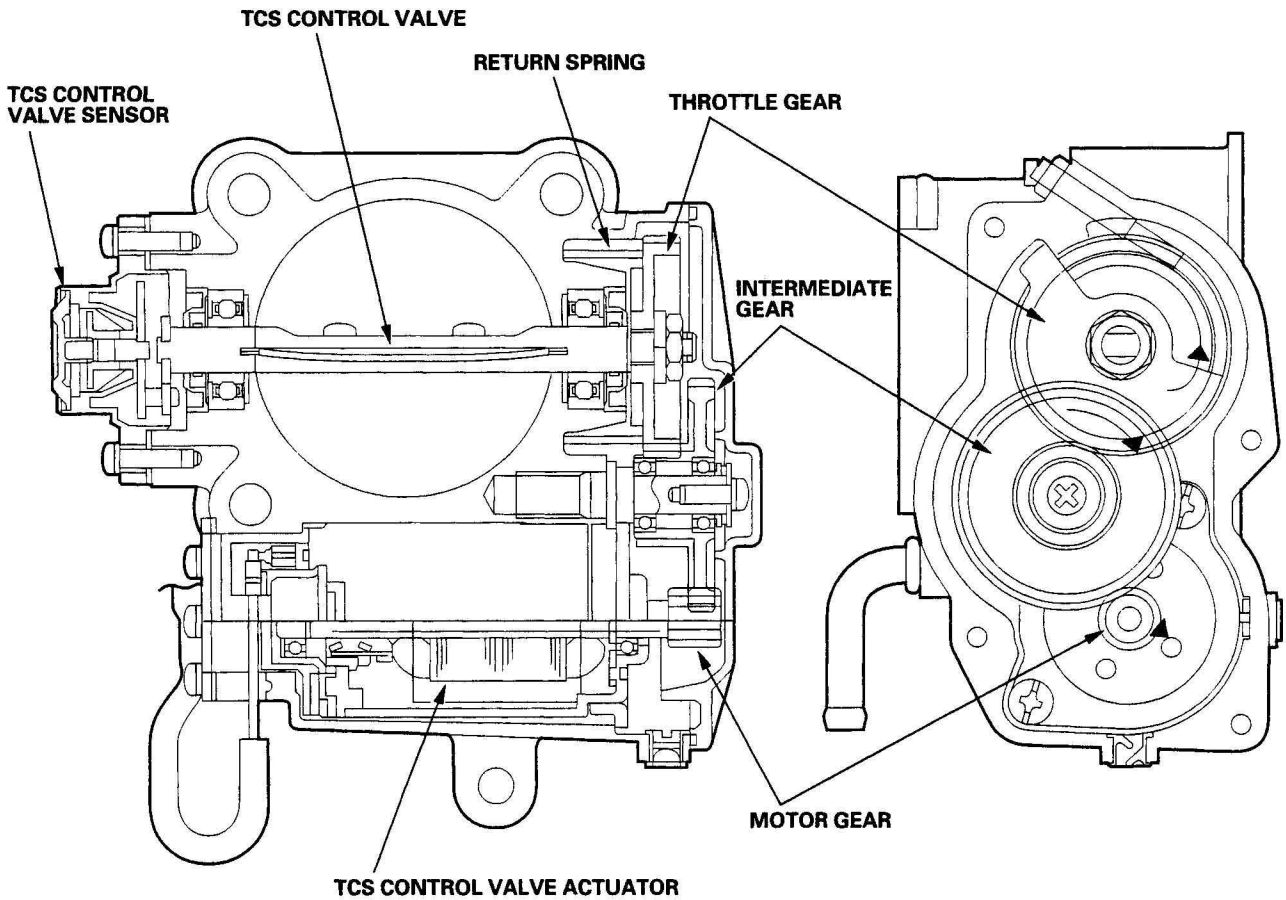


BACK

Protected by AR

TCS Control Valve Assembly

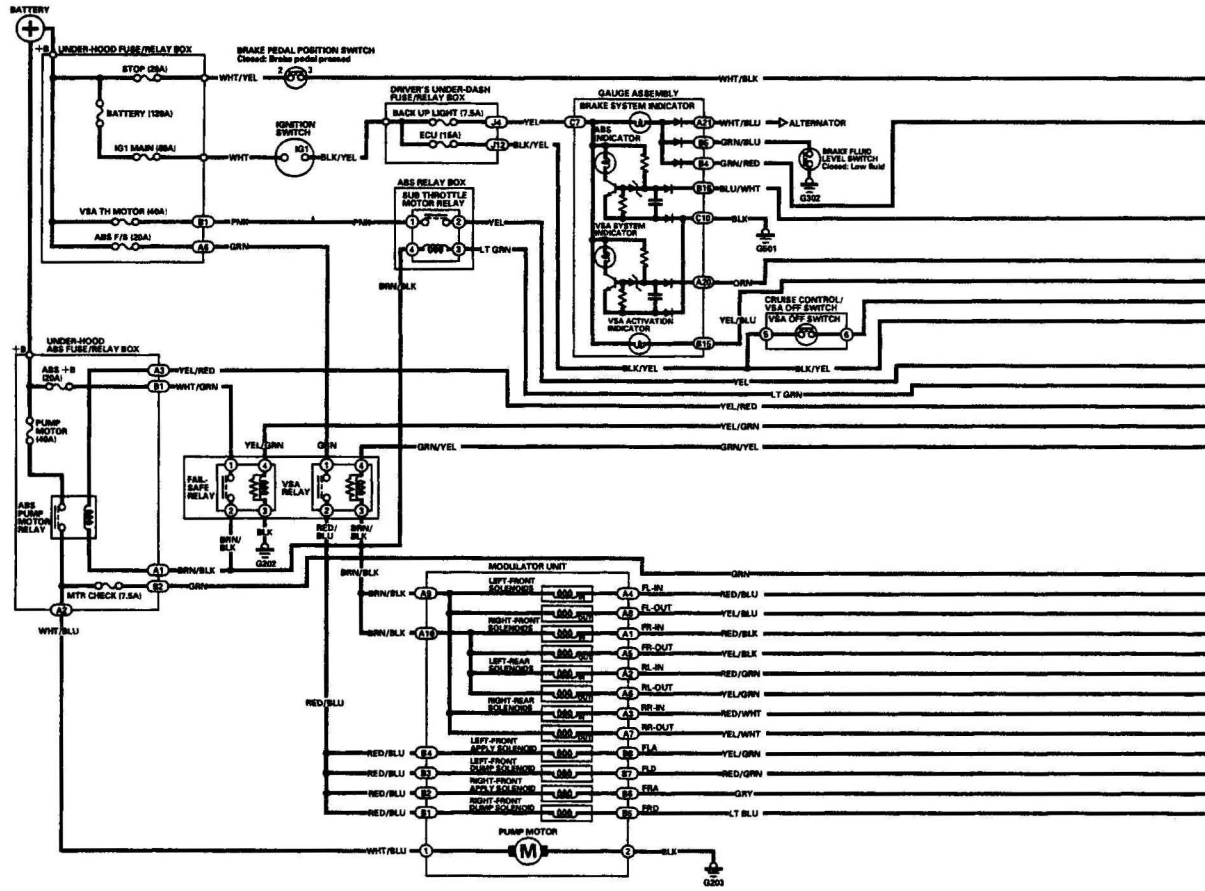
The TCS control valve assembly consists of the TCS control valve actuator (DC motor), TCS control valve sensor, TCS control valve, return spring, and three gears.
When the TCS is activated, the VSA control unit signals the TCS control valve actuator and PCM. The actuator is linked to the TCS control valve which is normally held in the fully open position by the return spring. Although the throttle valve is still within the driver's control, the engine output is reduced by the TCS control valve and PCM to achieve optimum traction.

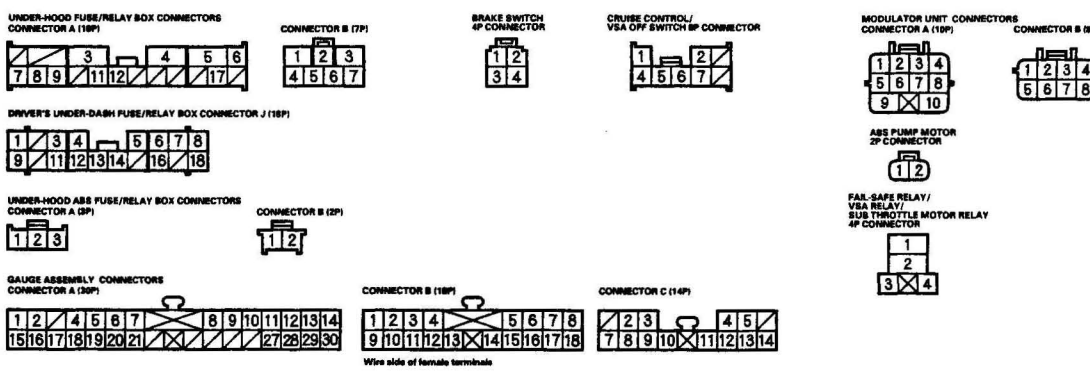


Protected by AR

VSA System Components

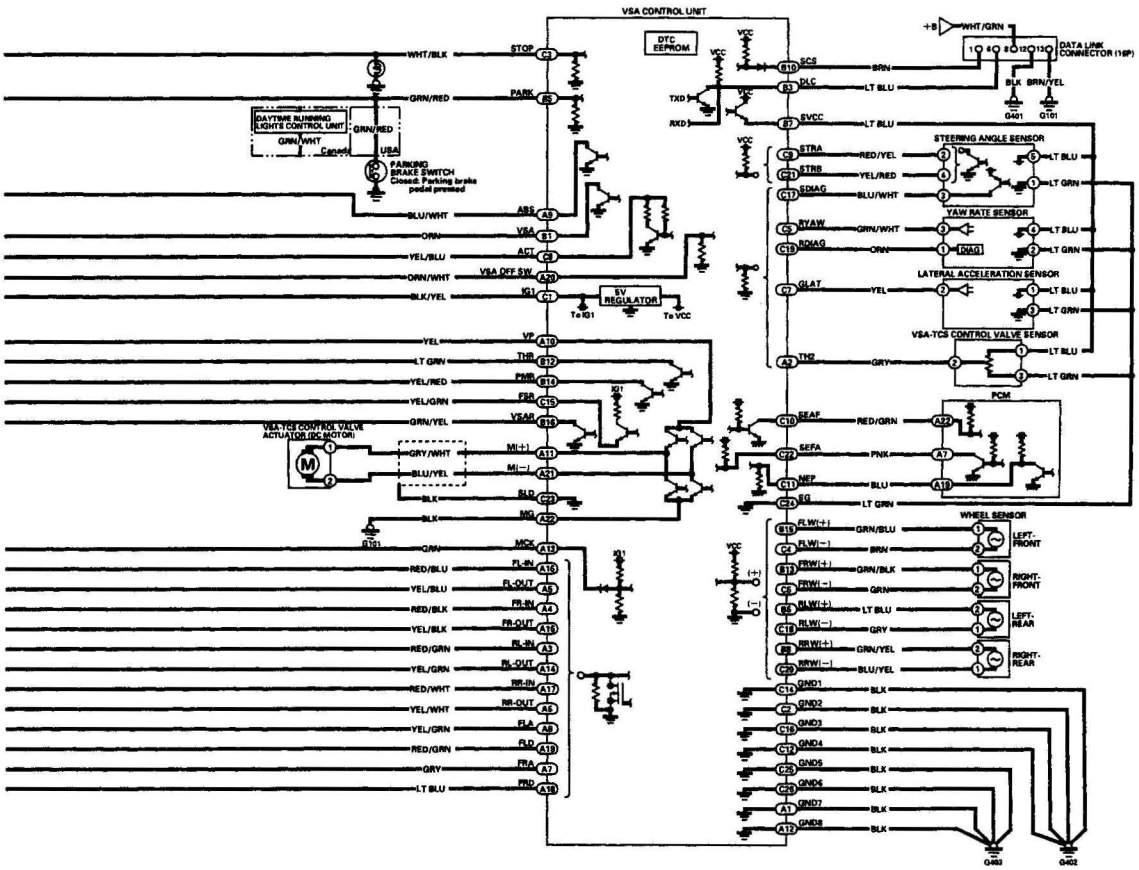
Circuit Diagram





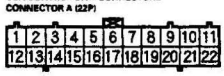
BACK

Protected by AR



VSA CONTROL UNIT CONNECTORS

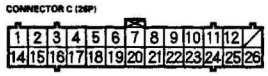
CONNECTOR A (22P)



CONNECTOR B (16P)



CONNECTOR C (26P)

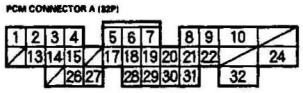


WHEEL SENSOR 2P CONNECTOR

FRONT/REAR



PCM CONNECTOR A (32P)



VSA-TCS CONTROL VALVE ACTUATOR 2P CONNECTOR



VSA-TCS CONTROL VALVE SENSOR 3P CONNECTOR



LATERAL ACCELERATION SENSOR 3P CONNECTOR



Terminal side of male terminals

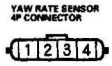
DATA LINK CONNECTOR (16P)



STEERING ANGLE SENSOR 5P CONNECTOR



YAW RATE SENSOR 4P CONNECTOR



Wire side of female terminals

BACK

Protected by AR

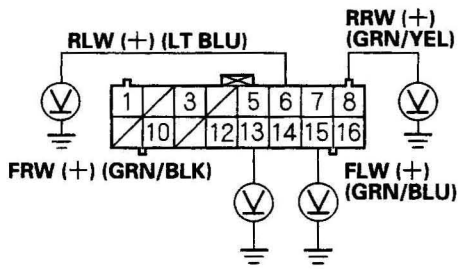
DTC Troubleshooting

DTC 11, 13, 15, 17: Wheel Sensor (Open/Short to Body Ground/Short to Power)

1. Disconnect VSA control unit connector B (16P) and connector C (26P).
2. Start the engine.
3. Measure the voltage between the appropriate wheel sensor (+) circuit terminal of VSA control unit connector B (16P) and body ground (see table).

DTC	Appropriate Terminal
11 (Right-front)	No. 13 : FRW (+)
13 (Left-front)	No. 15 : FLW (+)
15 (Right-rear)	No. 8 : RRW (+)
17 (Left-rear)	No. 6 : RLW (+)

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there 1 V or more?

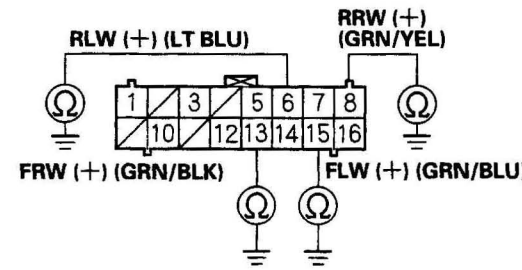
YES – Repair short to power in the (+) circuit wire between the VSA control unit and the appropriate wheel sensor. ■

NO – Go to step 4.

4. Turn the ignition switch OFF.
5. Check for continuity between the appropriate wheel sensor (+) circuit terminal and body ground (see table).

DTC	Appropriate Terminal
11 (Right-front)	No. 13 : FRW (+)
13 (Left-front)	No. 15 : FLW (+)
15 (Right-rear)	No. 8 : RRW (+)
17 (Left-rear)	No. 6 : RLW (+)

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES – Go to step 6.

NO – Go to step 7.

6. Disconnect the harness 2P connector from the appropriate wheel sensor, then check for continuity between the (+) and (–) terminals of the harness and body ground.

Is there continuity?

YES – Repair short to body ground in the (+) or (–) circuit wire between the VSA control unit and the wheel sensor. ■

NO – Replace the wheel sensor. ■

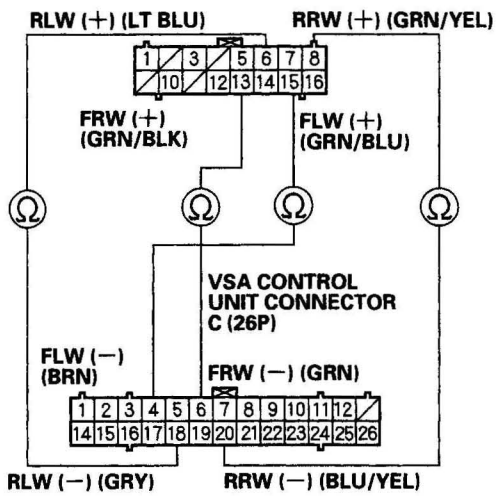
BACK

Protected by AR

7. Check the resistance between the appropriate wheel sensor (+) and (−) circuit terminals (see table).

DTC	Appropriate Terminal	
	(+) Side Connector B (16P)	(−) Side Connector C (26P)
11 (Right-front)	No. 13 : FRW (+)	No. 6 : FRW (−)
13 (Left-front)	No. 15 : FLW (+)	No. 4 : FLW (−)
15 (Right-rear)	No. 8 : RRW (+)	No. 20 : RRW (−)
17 (Left-rear)	No. 6 : RLW (+)	No. 18 : RLW (−)

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is the resistance between 450−2,000 Ω ?

YES − Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO − Go to step 8.

8. Disconnect the harness 2P connector from the appropriate wheel sensor, and check the resistance between the (+) and (−) terminals of the wheel sensor.

Is the resistance between 450−2,000 Ω ?

YES − Repair open in the (+) or (−) circuit wire, or short beween the (+) circuit wire and the (−) circuit wire between the VSA control unit and the wheel sensor. ■

NO − Replace the wheel sensor. ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC 12, 14, 16, 18: Wheel Sensor (Electrical Noise/Intermittent Interruption)

NOTE: If the ABS indicator comes on for the reasons described below, the indicator goes off when you test-drive the vehicle at 19 mph (30 km/h).

- Only the drive wheels rotated
- The vehicle spun
- Electrical noise

1. Visually check for appropriate wheel sensor and pulser installation (see table).

DTC	Appropriate Wheel Sensor
12	Right-front
14	Left-front
16	Right-rear
18	Left-rear

Are they installed correctly?

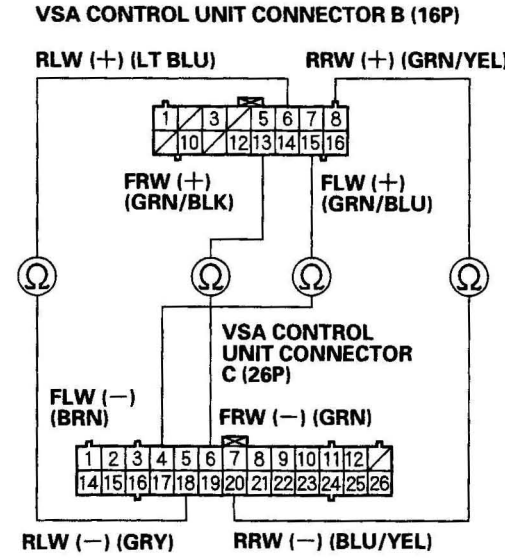
YES – Go to step 2.

NO – Reinstall or replace the appropriate wheel sensor or pulser. ■

2. Disconnect VSA control unit connector B (16P) and connector C (26P).

3. Measure the resistance between the appropriate wheel sensor (+) and (–) circuit terminals (see table).

DTC	Appropriate Terminal	
	(+) Side Connector B (16P)	(–) Side Connector C (26P)
12 (Right-front)	No. 13 : FRW (+)	No. 6 : FRW (–)
14 (Left-front)	No. 15 : FLW (+)	No. 4 : FLW (–)
16 (Right-rear)	No. 8 : RRW (+)	No. 20 : RRW (–)
18 (Left-rear)	No. 6 : RLW (+)	No. 18 : RLW (–)



Wire side of female terminals

Is there less than 450 Ω ?

YES – Repair short to another wire between the appropriate wheel sensor (+) and (–) circuits. ■

NO – Go to step 4.

BACK

Protected by AR

4. Check for continuity between the appropriate wheel sensor (+) circuit terminal and other wheel sensor (+) circuit terminals (see table).

DTC	Appropriate Terminal	Other Terminal		
12	No. 13 : FRW (+)	No. 15	No. 8	No. 6
14	No. 15 : FLW (+)	No. 13	No. 8	No. 6
16	No. 8 : RRW (+)	No. 13	No. 15	No. 6
18	No. 6 : RLW (+)	No. 13	No. 15	No. 8

Is there continuity?

YES—Repair short to another wire between the appropriate wheel sensor and the other wheel sensor. ■

NO—Clear the DTC, and test-drive the vehicle. If the ABS indicator comes on and the same DTC is indicated, check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

DTC 21, 22, 23, 24: Pulser

1. Clear the DTC.
2. Test-drive the vehicle at 19 mph (30 km/h) or more.

   Does the ABS indicator come on and are DTCs 21, 22, 23, or 24 indicated?

   YES—Go to step 3.

   NO—The system is OK at this time. ■
3. Check the appropriate pulser gear for a chipped tooth (see table).

DTC	Appropriate Pulser
21	Right-front
22	Left-front
23	Right-rear
24	Left-rear

Is the pulser OK?

YES—Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO—Replace the driveshaft or the hub unit (Chipped pulser gear). ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC 25: Yaw Rate Sensor

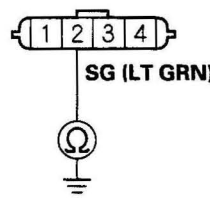
1. Clear the DTC.
2. Turn the ignition switch OFF, then turn it ON (II) again.
3. Test-drive the vehicle around a number of corners.
4. Verify the DTC.

   Is DTC 27 or 64 indicated?

   YES – Do the appropriate troubleshooting for the DTC. ■

   NO – Go to step 5.
5. Turn the ignition switch OFF.
6. Check for continuity between the yaw rate sensor 4P connector terminal No.2 and body ground.

YAW RATE SENSOR 4P CONNECTOR



Wire side of female terminals

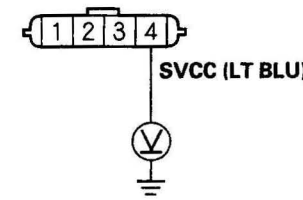
Is there continuity?

YES – Go to step 7.

NO – Repair open in the wire between the VSA control unit and the yaw rate sensor. ■

7. Turn the ignition switch ON (II).
8. Measure the voltage between the yaw rate sensor 4P connector terminal No.4 and body ground.

YAW RATE SENSOR 4P CONNECTOR



Wire side of female terminals

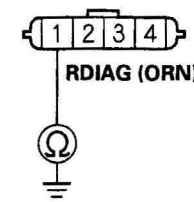
Is there about 5 V?

YES – Go to step 9.

NO – Repair open in the wire between the VSA control unit and the yaw rate sensor. ■

9. Turn the ignition switch OFF.
10. Disconnect VSA control unit connector C (26P) and the yaw rate sensor 4P connector.
11. Check for continuity between the yaw rate sensor 4P connector terminal No. 1 and body ground.

YAW RATE SENSOR 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the wire between the VSA control unit and the yaw rate sensor. ■

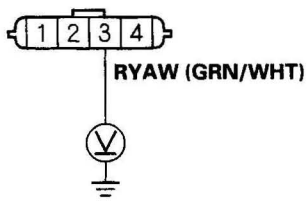
NO – Go to step 12.

BACK

Protected by AR

12. Start the engine.
13. Measure the voltage between the yaw rate sensor 4P connector terminal No. 3 and body ground.

YAW RATE SENSOR 4P CONNECTOR



Wire side of female terminals

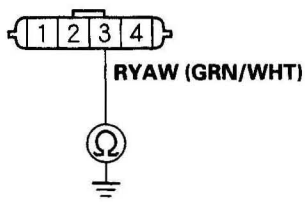
Is there 1 V or more?

YES – Repair short to power between the VSA control unit and the yaw rate sensor. ■

NO – Go to step 14.

14. Turn the ignition switch OFF.
15. Check for continuity between the yaw rate sensor 4P connector terminal No. 3 and body ground.

YAW RATE SENSOR 4P CONNECTOR



Wire side of female terminals

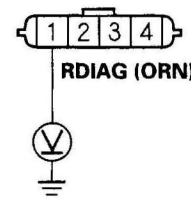
Is there continuity?

YES – Repair short to body ground in the wire between the VSA control unit and the yaw rate sensor. ■

NO – Go to step 16.

16. Connect VSA control unit connector C (26P) and the yaw rate sensor 4P connector.
17. Turn the ignition switch on (II).
18. Measure the voltage between the yaw rate sensor 4P connector terminal No. 1 and body ground.

YAW RATE SENSOR 4P CONNECTOR



Wire side of female terminals

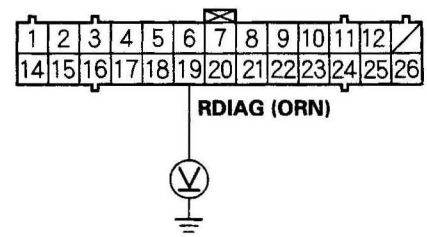
Is there about 0 V?

YES – Replace the yaw rate sensor. ■

NO – Go to step 19.

19. Measure the voltage between VSA control unit connector C (26P) terminal No. 19 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there about 0 V?

YES – Repair open in the wire between the VSA control unit and the yaw rate sensor. ■

NO – Go to step 20.

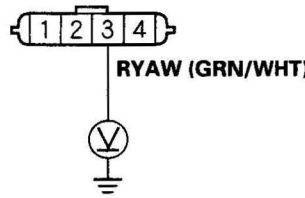
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

20. Measure the voltage between the yaw rate sensor 4P connector terminal No. 3 and body ground.

YAW RATE SENSOR 4P CONNECTOR



Wire side of female terminals

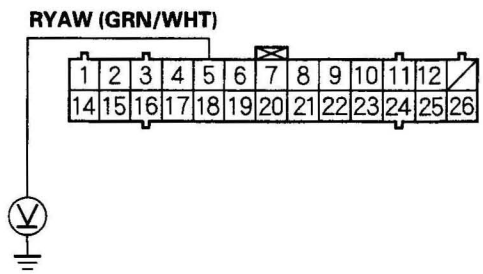
Is there about 2.5 V?

YES – Go to step 21.

NO – Replace the yaw rate sensor. ■

21. Measure the voltage between the VSA control unit connector C (26P) terminal No. 5 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there about 2.5 V?

YES – Go to step 22.

NO – Repair open in the wire between the VSA control unit and the yaw rate sensor. ■

22. Substitute a known-good yaw rate sensor.

23. Do the neutral position memorization (see page 19-189).

24. Test-drive the vehicle around a number of right and left hand corners.

Is the DTC 25 indicated?

YES – Check for loose VSA control unit connectors. If necessary, replace the VSA control unit. ■

NO – Check for loose yaw rate sensor connectors. If necessary, replace the yaw rate sensor. ■

BACK

Protected by AR

DTC 26: Lateral Acceleration Sensor

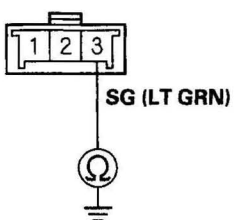
1. Clear the DTC.
2. Turn the ignition switch OFF, then turn it ON (II) again.
3. Test-drive the vehicle around a number of right and left hand corners.
4. Verify the DTC.

   Is DTC 64 indicated?

   YES – Do the appropriate troubleshooting for DTC 64. ■

   NO – Go to step 5.
5. Turn the ignition switch OFF.
6. Check for continuity between the lateral acceleration sensor 3P connector terminal No. 3 and body ground.

LATERAL ACCELERATION SENSOR 3P CONNECTOR



Terminal side of male terminals

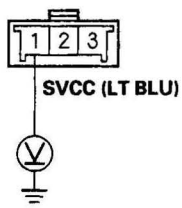
Is there continuity?

YES – Go to step 7.

NO – Repair open in the wire between the VSA control unit and the lateral acceleration sensor. ■

7. Turn the ignition switch ON (II).
8. Measure the voltage between the lateral acceleration sensor 3P connector terminal No. 1 and body ground.

LATERAL ACCELERATION SENSOR 3P CONNECTOR



Terminal side of male terminals

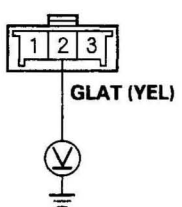
Is there about 5 V?

YES – Go to step 9.

NO – Repair open in the wire between the VSA control unit and the lateral acceleration sensor. ■

9. Turn the ignition switch OFF.
10. Disconnect VSA control unit connector C (26P) and the lateral acceleration sensor 3P connector.
11. Start the engine.
12. Measure the voltage between the lateral acceleration sensor 3P connector terminal No. 2 and body ground.

LATERAL ACCELERATION SENSOR 3P CONNECTOR



Terminal side of male terminals

Is there 1 V or more?

YES – Repair short to power in the wire between the VSA control unit and the lateral sensor. ■

NO – Go to step 13.

(cont'd)

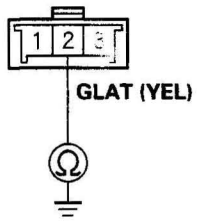
Protected by AR

DTC Troubleshooting (cont'd)

13. Turn the ignition switch OFF.

14. Check for continuity between the lateral acceleration sensor 3P connector terminal No. 2 and body ground.

LATERAL ACCELERATION SENSOR 3P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES – Repair short to body ground in the wire between the VSA control unit and the lateral acceleration sensor. ■

NO – Go to step 15.

15. Connect VSA control unit connector C (26P) and the lateral acceleration sensor 3P connector.

16. Do the lateral acceleration sensor inspection (see page 19-188).

Is it OK?

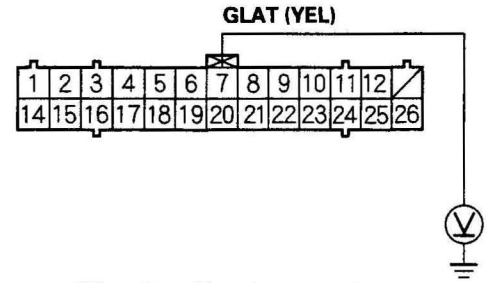
YES – Go to step 17.

NO – Replace the lateral acceleration sensor. ■

17. Turn the ignition switch ON (II).

18. Measure the voltage between VSA control unit connector C (26P) terminal No. 7 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there about 2.5 V?

YES – Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – Repair open in the wire between the VSA control unit and the lateral acceleration sensor. ■

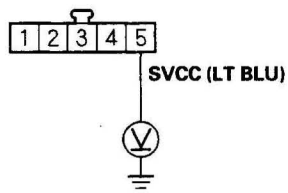
BACK

Protected by AR

DTC 27: Steering Angle Sensor

1. Turn the ignition switch ON (II).
2. Measure the voltage between the steering angle sensor 5P connector terminal No. 5 and body ground.

STEERING ANGLE SENSOR 5P CONNECTOR



Wire side of female terminals

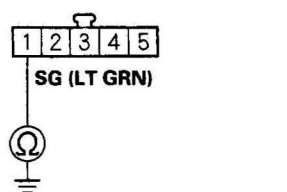
Is there about 5 V?

YES – Go to step 3.

NO – Repair open in the wire between the VSA control unit and the steering angle sensor. ■

3. Turn the ignition switch OFF.
4. Check for continuity between the steering angle sensor 5P connector terminal No. 1 and body ground.

STEERING ANGLE SENSOR 5P CONNECTOR



Wire side of female terminals

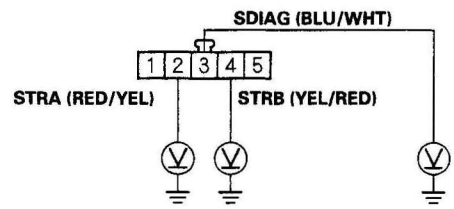
Is there continuity?

YES – Go to step 5.

NO – Repair open in the wire between the VSA control unit and the steering angle sensor. ■

5. Turn the ignition switch OFF.
6. Disconnect VSA control unit connector C (26P) and the steering angle sensor 5P connector.
7. Start the engine.
8. Measure the voltage between body ground and the steering angle sensor 5P connector terminals No. 2, No. 3 and No. 4 individually.

STEERING ANGLE SENSOR 5P CONNECTOR



Wire side of female terminals

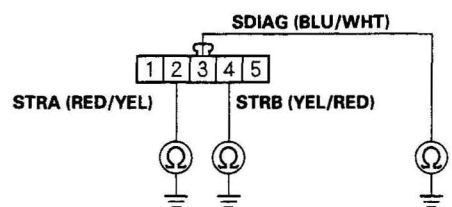
Is there 1 V or more?

YES – Repair short to power in the wire between the VSA control unit and the steering angle sensor. ■

NO – Go to step 9.

9. Turn the ignition switch OFF.
10. Check for continuity between body ground and the steering angle sensor 5P connector terminals No. 2, No. 3 and No. 4 individually.

STEERING ANGLE SENSOR 5P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the wire between the VSA control unit and the steering angle sensor. ■

NO – Go to step 11.

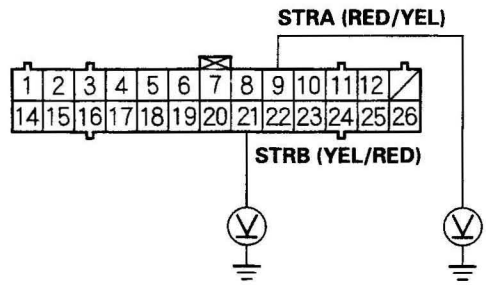
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

11. Connect VSA control unit connector C (26P).
12. Turn the ignition switch ON (II).
13. Measure the voltage between body ground and VSA control unit connector C (26P) terminals No. 9 and No. 21 individually.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

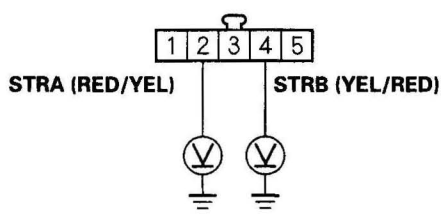
Is there about 5 V?

YES — Go to step 14.

NO — Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

14. Measure the voltage between body ground and the steering angle sensor 5P connector terminals No. 2 and No. 4 individually.

STEERING ANGLE SENSOR 5P CONNECTOR



Wire side of female terminals

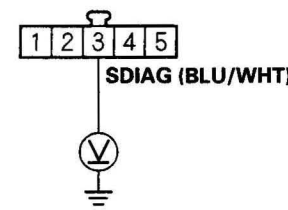
Is there about 5 V?

YES — Go to step 15.

NO — Repair open in the wire between the VSA control unit and the steering angle sensor. ■

15. Turn the ignition switch OFF.
16. Connect the steering angle sensor 5P connector.
17. Turn the ignition switch ON (II).
18. Measure the voltage between the steering angle sensor 5P connector terminal No. 3 and body ground.

STEERING ANGLE SENSOR 5P CONNECTOR



Wire side of female terminals

Is there about 0 V?

YES — Check for loose connectors, if necessary, replace the steering angle sensor. ■

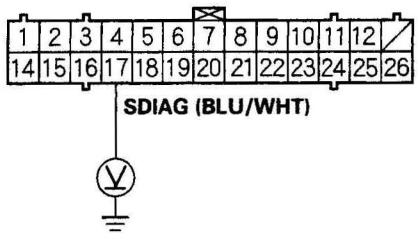
NO — Go to step 19.

BACK

Protected by AR

19. Measure the voltage between VSA control unit connector C (26P) terminal No. 17 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

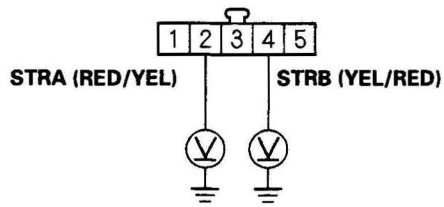
Is there about 0 V?

YES – Repair open in the wire between the VSA control unit and the steering angle sensor. ■

NO – Go to step 20.

20. Measure the voltage between body ground and the steering angle sensor 5P connector terminals No. 2 and No. 4 individually while turning the steering wheel slowly.

STEERING ANGLE SENSOR 5P CONNECTOR



Wire side of female terminals

Is there 0 V to 5 V repeatedly?

YES – The system is OK at this time. If the problem recurs, check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – Check for loose connectors, if necessary, replace the steering angle sensor. ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC 31, 32, 33, 34, 35, 36, 37, 38: Solenoid

1. Verify the DTC.

   Is DTC 54 indicated?

   YES—Do the appropriate troubleshooting for DTC 54.■

   NO—Go to step 2.

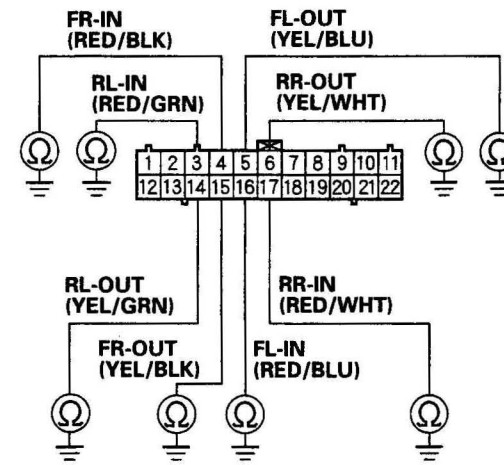
2. Turn the ignition switch OFF.

3. Disconnect the modulator unit connector A (10P) and the VSA control unit connector A (22P).

4. Check for continuity between the appropriate VSA control unit connector A (22P) solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 4
32: FR-OUT	No. 15
33: FL-IN	No. 16
34: FL-OUT	No. 5
35: RR-IN	No. 17
36: RR-OUT	No. 6
37: RL-IN	No. 3
38: RL-OUT	No. 14

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female treminals

Is there continuity?

YES—Repair short to body ground in the appropriate solenoid circuit wire between the VSA control unit and the modulator unit.■

NO—Go to step 5.

BACK

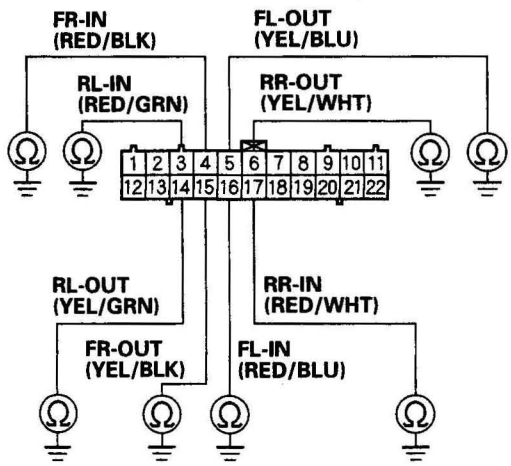
Protected by AR

5. Connect modulator unit connector A (10P).

6. Check for continuity between the appropriate VSA control unit connector A (22P) solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 4
32: FR-OUT	No. 15
33: FL-IN	No. 16
34: FL-OUT	No. 5
35: RR-IN	No. 17
36: RR-OUT	No. 6
37: RL-IN	No. 3
38: RL-OUT	No. 14

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female treminals

Is there continuity?

YES – Replace the modulator unit. ■

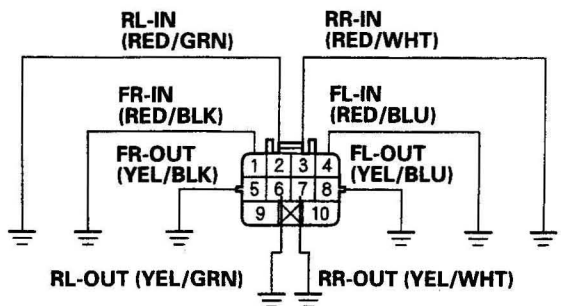
NO – Go to step 7.

7. Disconnect modulator unit connector A (10P).

8. Connect the appropriate modulator unit connector A (10P) solenoid circuit terminal to body ground with a jumper wire (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 1
32: FR-OUT	No. 5
33: FL-IN	No. 4
34: FL-OUT	No. 8
35: RR-IN	No. 3
36: RR-OUT	No. 7
37: RL-IN	No. 2
38: RL-OUT	No. 6

MODULATOR UNIT CONNECTOR A (10P)



Wire side of female terminals

(cont'd)

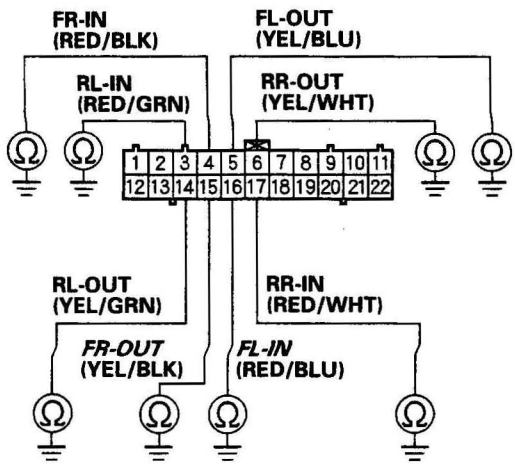
Protected by AR

DTC Troubleshooting (cont'd)

9. Check for continuity between the appropriate VSA control unit connector A (22P) solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 4
32: FR-OUT	No. 15
33: FL-IN	No. 16
34: FL-OUT	No. 5
35: RR-IN	No. 17
36: RR-OUT	No. 6
37: RL-IN	No. 3
38: RL-OUT	No. 14

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female treminals

Is there continuity?

YES—Go to step 10.

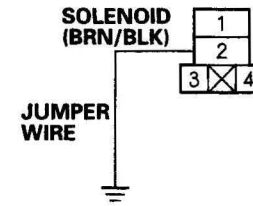
NO—Repair open in the appropriate solenoid circuit wire between the VSA control unit and the modulator unit. ■

10. Remove the jumper wire from modulator unit connector A (10P).

11. Connect modulator unit connector A (10P).

12. Connect the fail-safe relay 4P connector terminal No. 2 to body ground with a jumper wire. The wire colors of the fail-safe relay 4P connector are WHT/GRN, BRN/BLK, BLK, and YEL/GRN.

FAIL-SAFE RELAY 4P CONNECTOR



Wire side of female terminals

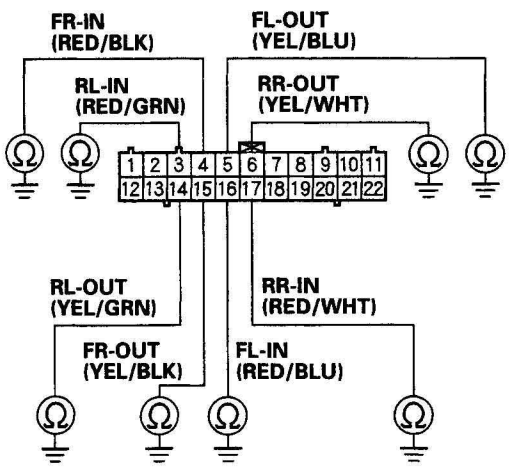
BACK

Protected by AR

13. Check the resistance between the appropriate VSA control unit connector A (22P) terminal and body ground (see table).
IN: 8 – 10 Ω (at 20°C, 68°F)
OUT: 3 – 5 Ω (at 20°C, 68°F)

DTC	Appropriate Terminal
31: FR-IN	No. 4
32: FR-OUT	No. 15
33: FL-IN	No. 16
34: FL-OUT	No. 5
35: RR-IN	No. 17
36: RR-OUT	No. 6
37: RL-IN	No. 3
38: RL-OUT	No. 14

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female treminals

Is the resistance OK?

YES – Go to step 14.

NO – Replace the modulator unit. ■

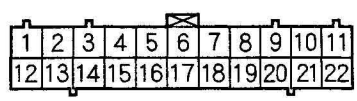
14. Disconnect modulator unit connector A (10P) and connector B (8P), and remove the jumper wire from the fail-safe relay 4P connector.

15. Check for continuity between the appropriate VSA control unit connector A (22P) terminal and all other ABS and VSA solenoid circuit terminals (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 4
32: FR-OUT	No. 15
33: FL-IN	No. 16
34: FL-OUT	No. 5
35: RR-IN	No. 17
36: RR-OUT	No. 6
37: RL-IN	No. 3
38: RL-OUT	No. 14

VSA Solenoid	Appropriate Terminal
FRA	No. 7
FRD	No. 18
FLA	No. 8
FLD	No. 19

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there continuity?

YES – Repair short in the appropriate wires between the VSA control unit and the modulator unit. ■

NO – Go to step 16.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

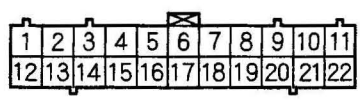
16. Connect modulator unit connector A (10P) and connector B (8P).

17. Check for continuity between the appropriate VSA control unit connector A (22P) terminal and all other ABS and VSA solenoid circuit terminals (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 4
32: FR-OUT	No. 15
33: FL-IN	No. 16
34: FL-OUT	No. 5
35: RR-IN	No. 17
36: RR-OUT	No. 6
37: RL-IN	No. 3
38: RL-OUT	No. 14

VSA Solenoid	Appropriate Terminal
FRA	No. 7
FRD	No. 18
FLA	No. 8
FLD	No. 19

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there less than 3 Ω ?

YES—Replace the modulator unit.■

NO—Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck.■

DTC 41, 42, 43, 44: Wheel Lock

1. Check for brake drag.

   Do the brakes drag?

   YES—Repair the brake drag.■

   NO—Go to step 2.

2. Check the installation of the appropriate wheel sensor (see table).

DTC	Appropriate Wheel Sensor
41	Right-front
42	Left-front
43	Right-rear
44	Left-rear

   Is it correct?

   YES—Go to step 3.

   NO—Reinstall the wheel sensor correctly.■

3. Check the modulator using the Honda PGM Tester.

   Is kickback felt in the pedal?

   YES—The probable cause was the vehicle spun during cornering. If the problem recurs, check for loose connectors, or try a known-good VSA control unit.■

   NO—Check for loose modulator unit connectors. If necessary, replace the modulator unit.■

BACK

Protected by AR

DTC 45, 46, 47, 48: VSA Solenoid

1. Verify the DTC.

   Is DTC 54 or 55 indicated?

   YES – Do the appropriate troubleshooting for the DTC. ■

   NO – Go to step 2.

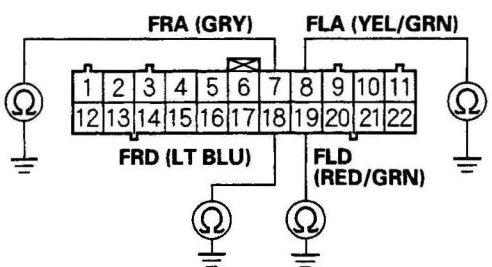
2. Turn the ignition switch OFF.

3. Disconnect modulator unit connector B (8P) and VSA control unit connector A (22P).

4. Check for continuity between the appropriate VSA control unit connector A (22P) VSA solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
45: FRA	No. 7
46: FRD	No. 18
47: FLA	No. 8
48: FLD	No. 19

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the appropriate VSA solenoid circuit wire between the VSA control unit and the modulator unit. ■

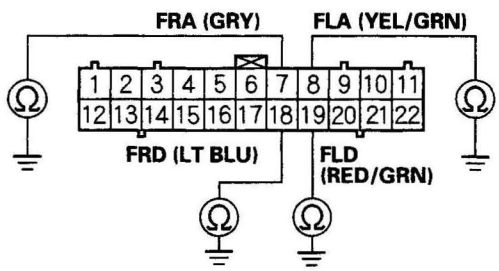
NO – Go to step 5.

5. Connect the modulator unit connector B (8P).

6. Check for continuity between the appropriate VSA control unit connector A (22P) VSA solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
45: FRA	No. 7
46: FRD	No. 18
47: FLA	No. 8
48: FLD	No. 19

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there continuity?

YES – Replace the modulator unit. ■

NO – Go to step 7.

7. Disconnect modulator unit connector B (8P).

(cont'd)

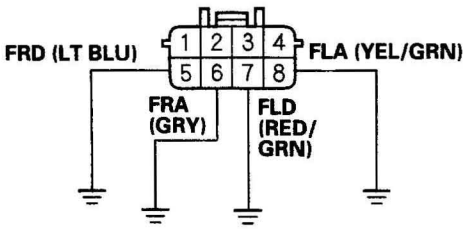
Protected by AR

DTC Troubleshooting (cont'd)

8. Connect the appropriate modulator unit connector B (8P) VSA solenoid circuit terminal to body ground with a jumper wire (see table).

DTC	Appropriate Terminal
45: FRA	No. 6
46: FRD	No. 5
47: FLA	No. 8
48: FLD	No. 7

MODULATOR UNIT CONNECTOR B (8P)

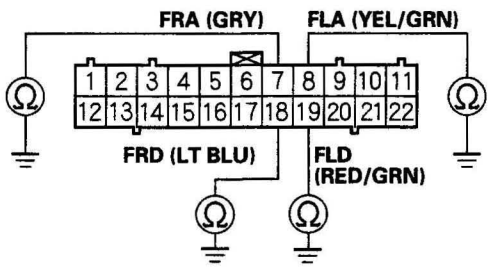


Wire side of female terminals

9. Check for continuity between the appropriate VSA control unit connector A (22P) VSA solenoid circuit terminal and body ground (see table).

DTC	Appropriate Terminal
45: FRA	No. 7
46: FRD	No. 18
47: FLA	No. 8
48: FLD	No. 19

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there continuity?

YES—Go to step 10.

NO—Repair open in the appropriate VSA solenoid circuit wire between the VSA control unit and the modulator unit.■

10. Remove the jumper wire from modulator unit connector B (8P).

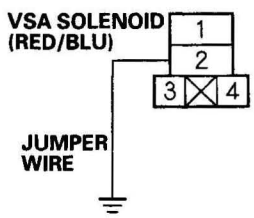
11. Connect modulator unit connector B (8P).

BACK

Protected by AR

12. Connect the VSA relay 4P connector terminal No. 2 to body ground with a jumper. The wire colors of the VSA relay connector are GRN, RED/BLU, GRN/YEL, and BRN/BLK.

VSA RELAY 4P CONNECTOR

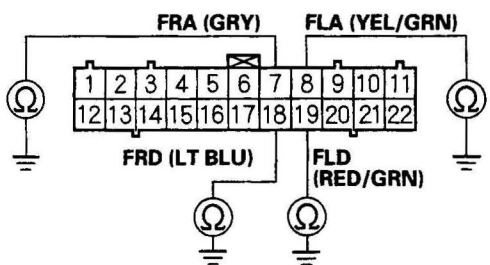


Wire side of female terminals

13. Check the resistance between the appropriate VSA control unit connector A (22P) terminal and body ground (see table).
APPLY/DUMP: 3–5 Ω (at 20 °C, 68 °F)

DTC	Appropriate Terminal
45: FRA	No. 7
46: FRD	No. 18
47: FLA	No. 8
48: FLD	No. 19

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is the resistance OK?

YES—Go to step 14.

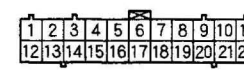
NO—Replace the modulator unit.■

14. Disconnect modulator unit connector B (8P), and remove the jumper wire from the VSA relay 4P connector.

15. Check for continuity between the appropriate VSA control unit connector A (22P) terminal and all other VSA solenoid circuit terminals (see table).

DTC	Appropriate Terminal
45: FRA	No. 7
46: FRD	No. 18
47: FLA	No. 8
48: FLD	No. 19

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the appropriate wires between the VSA control unit and the modulator unit.■

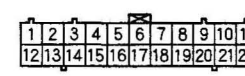
NO—Go to step 16.

16. Connect modulator unit connector B (8P).

17. Measure the resistance between the appropriate VSA control unit connector A (22P) terminal and all other VSA solenoid circuit terminals (see table).

DTC	Appropriate Terminal
45: FRA	No. 7
46: FRD	No. 18
47: FLA	No. 8
48: FLD	No. 19

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there less than 3 Ω ?

YES—Replace the modulator unit.■

NO—Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck.■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

DTC 51: Motor Lock

1. Clear the DTC.
2. Do the neutral position memorization (see page 19-189).
3. Test-drive the vehicle at 6 mph (10 km/h) or more.

   Do the ABS and VSA system indicators come on?

   YES – Do the appropriate troubleshooting for DTC 52.■

   NO – The system is OK at this time.■

DTC 52: Motor Stuck OFF

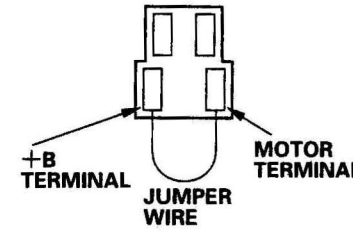
1. Check the PUMP MOTOR (40A) fuse in the under-hood ABS fuse/relay box.

   Is the fuse OK?

   YES – Reinstall the fuse, and go to step 4.

   NO – Replace the fuse, and go to step 2.
2. Remove the ABS pump motor relay.
3. Connect the ABS pump motor relay connector +B and MOTOR terminals with a jumper wire for a moment, and check the fuse.

ABS PUMP MOTOR RELAY CONNECTOR



   Is the fuse blown?

   YES – Check for a short to body ground in the motor power source circuit.■

   NO – Go to step 4.
4. Check the MTR CHECK (7.5A) fuse in the under-hood ABS fuse/relay box.

   Is the fuse OK?

   YES – Remove the fuse, and go to step 6.

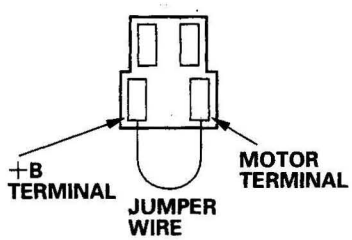
   NO – Replace the fuse, and go to step 5.

BACK

Protected by AR

5. Connect the ABS pump motor relay connector +B and motor terminals with a jumper wire for a moment, and check the MTR CHECK (7.5A) fuse.

ABS PUMP MOTOR RELAY CONNECTOR



Is the fuse blown?

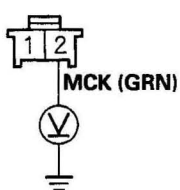
YES – Check for a short to body ground in the MCK circuit. ■

NO – Remove the MTR CHECK (7.5A) fuse in the under-hood ABS fuse/relay box, and go to step 6.

6. Turn the ignition switch ON (II).

7. Measure the voltage between under-hood ABS fuse/relay box connector B (2P) terminal No. 2 and body ground.

UNDER-HOOD ABS FUSE/RELAY BOX CONNECTOR B (2P)



Wire side of female terminals

Is there about 10 V?

YES – Go to step 8.

NO – Repair open in the wire between the under-hood ABS fuse/relay box and the VSA control unit. ■

8. Check the ABS pump motor relay in the under-hood ABS fuse/relay box.

Is the relay OK?

YES – Go to step 9.

NO – Replace the ABS pump motor relay. ■

9. Connect the pump motor relay connector +B and MOTOR terminals with a jumper wire for a moment.

Does the pump motor operate?

YES – Go to step 14.

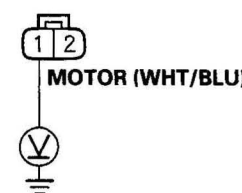
NO – Go to step 10.

10. Disconnect the pump motor 2P connector.

11. Connect the ABS pump motor relay connector +B and MOTOR terminals with a jumper wire.

12. Measure the voltage between the pump motor 2P connector terminal No. 1 and body ground.

PUMP MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 13.

NO – Repair open in the wire between the under-hood ABS fuse/relay box and pump motor. ■

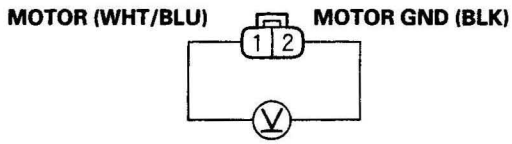
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

13. Measure the voltage between the pump motor 2P connector terminal No. 1 and No. 2.

PUMP MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

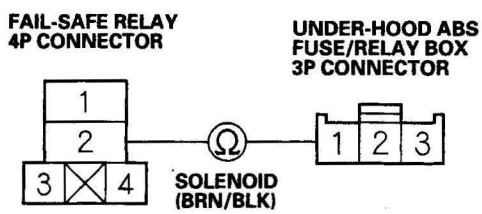
YES—Replace the modulator unit. ■

NO—Repair open in the wire between the pump motor and body ground (G203). ■

14. Remove the fail-safe relay from the ABS relay box.

15. Disconnect under-hood ABS fuse/relay box connector A (3P).

16. Check for continuity between the fail-safe relay connector terminal No. 2 terminal and under-hood ABS fuse/relay box connector A (3P) terminal No. 1.



Wire side of female terminals

Is there continuity?

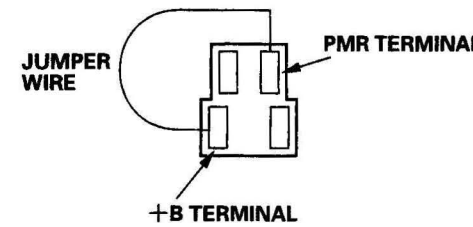
YES—Go to step 17.

NO—Repair open in the wire between the fail-safe relay and the under-hood ABS fuse/relay box. ■

17. Disconnect the pump motor 2P connector and the VSA control unit connector B (16P).

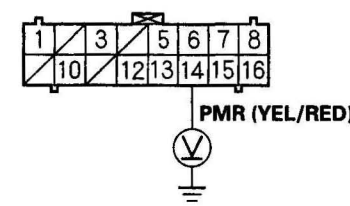
18. Connect the ABS pump motor relay connector +B and PMR terminals with a jumper wire.

ABS PUMP MOTOR RELAY CONNECTOR



19. Measure the voltage between VSA control unit connector B (16P) terminal No. 14 and body ground.

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there battery voltage?

YES—Go to step 20.

NO—Repair open in the wire between the under-hood ABS fuse/relay box and the VSA control unit. ■

20. Remove the jumper wire from the ABS pump motor relay connector.

21. Reconnect VSA control unit connector B (16P), and reinstall the fail-safe relay in the ABS relay box.

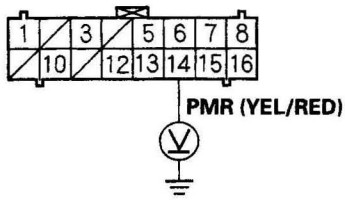
22. Start the engine.

BACK

Protected by AR

23. Measure the voltage between VSA control unit connector B (16P) terminal No. 14 and body ground.

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there battery voltage?

YES – Repair short to power in the wire between the under-hood ABS fuse/relay box and the VSA control unit. ■

NO – If the problem recurs, check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

DTC 53: Motor Stuck ON

1. Check that the pump motor operates with the ignition switch OFF.

   Does the pump motor operate?

   YES – Replace the ABS pump motor relay. ■

   NO – Go to step 2.

2. Check the MTR CHECK (7.5A) fuse in the under-hood ABS fuse/relay box.

   Is the fuse OK?

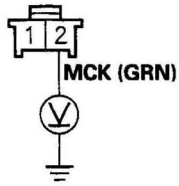
   YES – Remove the fuse, and go to step 3.

   NO – Replace the fuse, and recheck. ■

3. Turn the ignition switch ON (II).

4. Measure the voltage between under-hood ABS fuse/relay box connector B (2P) terminal No. 2 and body ground.

   UNDER-HOOD ABS FUSE/RELAY BOX CONNECTOR B (2P)



Wire side of female terminals

Is there about 10 V?

YES – Go to step 5.

NO – Repair open in the wire between the under-hood ABS fuse/relay box and the VSA control unit. ■

5. Reinstall the MTR CHECK (7.5A) fuse in the under-hood ABS fuse/relay box.

6. Disconnect the pump motor 2P connector.

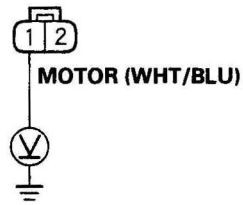
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Measure the voltage between the pump motor 2P connector terminal No. 1 and body ground.

PUMP MOTOR 2P CONNECTOR



Wire side of female terminals

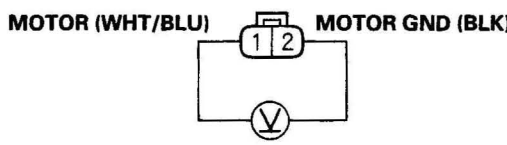
Is there about 10 V?

YES – Go to step 8.

NO – Repair open in the wire between the under-hood ABS fuse/relay box and the pump motor. ■

8. Measure the voltage between the pump motor 2P connector terminal No. 1 and No. 2.

PUMP MOTOR 2P CONNECTOR



Wire side of female terminals

Is there about 10 V?

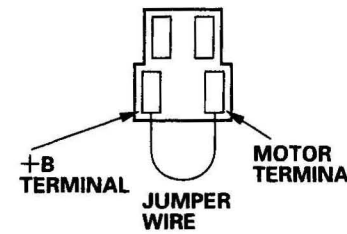
YES – Go to step 9.

NO – Repair open in the wire between the pump motor and body ground (G203). ■

9. Reconnect the pump motor 2P connector.

10. Remove the ABS pump motor relay, then connect relay +B and MOTOR terminals together with a jumper wire.

ABS PUMP MOTOR RELAY CONNECTOR



Does the pump motor run?

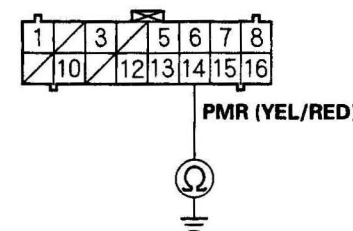
YES – Go to step 11.

NO – Replace the pump motor. ■

11. Disconnect VSA control unit connector B (16P).

12. Check for continuity between terminal No. 14 and body ground.

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the wire between the under-hood ABS fuse/relay box and the VSA control unit. ■

NO – Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

BACK

Protected by AR

DTC 54: Fail-safe Relay

1. Check the ABS +B (20A) fuse in the under-hood ABS fuse/relay box, and reinstall the fuse if it is OK.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse, and recheck. ■

2. Reinstall the fuse, and turn the ignition switch ON (II).

   Does the fuse blow?

   YES – Repair short to body ground in the wire between the fail-safe relay, pump motor relay, VSA relay, sub-throttle motor relay, and modulator unit. ■

   NO – Go to step 3.

3. Check the fail-safe relay in the under-hood ABS fuse/relay box. The wire colors of the fail-safe relay 4P connector are WHT/GRN, BRN/BLK, BLK, and YEL/GRN.

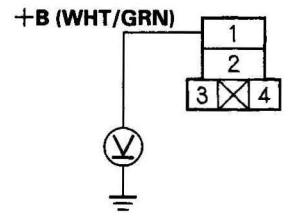
   Is the relay OK?

   YES – With the fail-safe relay removed, and go to step 4.

   NO – Replace the fail-safe relay. ■

4. Measure the voltage between the fail-safe relay 4P connector terminal No. 1 and body ground.

   FAIL-SAFE RELAY 4P CONNECTOR



   Wire side of female terminals

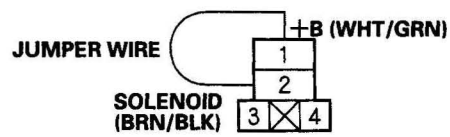
   Is there battery voltage?

   YES – Go to step 5.

   NO – Repair open in the wire between the under-hood fuse/relay box and the fail-safe relay. ■

5. Connect the fail-safe relay 4P connector terminal No. 1 to No. 2 with a jumper wire.

   FAIL-SAFE RELAY 4P CONNECTOR



   Wire side of female terminals

6. Disconnect modulator unit connector A (10P).

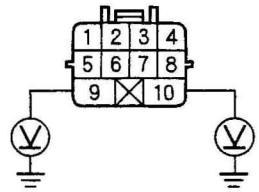
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

7. Measure the voltage between body ground and terminals No. 9 and No. 10 individually.

MODULATOR UNIT CONNECTOR A (10P)



Wire side of female terminals

Is there battery voltage?

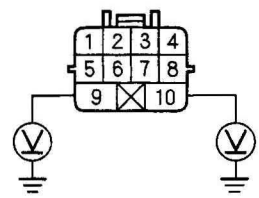
YES – Go to step 8.

NO – Repair open in the wire between the fail-safe relay and the modulator unit. ■

8. Remove the jumper wire from the fail-safe relay connector.

9. Measure the voltage between body ground and modulator unit connector A (10P) terminals No. 9 and No. 10 individually.

MODULATOR UNIT CONNECTOR A (10P)



Wire side of female terminals

Is there battery voltage?

YES – Repair short to power in the wire between the ABS pump motor relay, fail-safe relay, VSA relay, sub-throttle motor relay, and modulator unit. ■

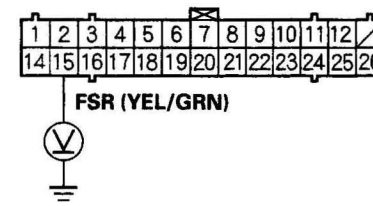
NO – Go to step 10.

10. Disconnect VSA control unit connector C (26P).

11. Turn the ignition switch ON (II).

12. Measure the voltage between terminal No. 15 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

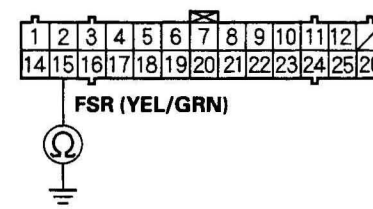
Is there battery voltage?

YES – Repair short to power in the wire between the VSA control unit and the fail-safe relay. ■

NO – Go to step 13.

13. Check for continuity between VSA control unit connector C (26P) terminal No. 15 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the wire between the VSA control unit and the fail-safe relay. ■

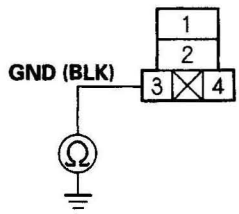
NO – Go to step 14.

BACK

Protected by AR

14. Check for continuity between the fail-safe relay 4P connector terminal No. 3 and body ground.

FAIL-SAFE RELAY 4P CONNECTOR



Wire side of female terminals

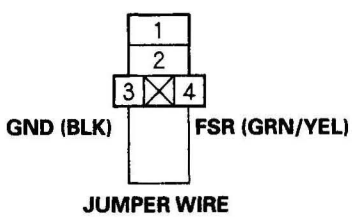
Is there continuity?

YES – Go to step 15.

NO – Check for an open in the wire between the fail-safe relay and body ground. If the wire is OK, check for poor ground at G202. ■

15. Connect the fail-safe relay 4P connector terminals No. 3 and No. 4 with a jumper wire.

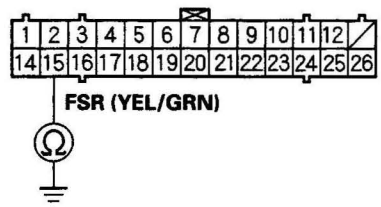
FAIL-SAFE RELAY 4P CONNECTOR



Wire side of female terminals

16. Check for continuity between VSA control unit connector C (26P) terminal No. 15 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there continuity?

YES – If the problem recurs, check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – Repair open in the wire between the VSA control unit and the fail-safe relay. ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC 55: VSA Relay

1. Turn the ignition switch OFF, then turn it ON (II) again.
2. Verify the DTC.

   Is DTC 54 indicated?

   YES – Do the appropriate troubleshooting for DTC 54. ■

   NO – Go to step 3.
3. Check the VSA F/S (20A) fuse in the under-hood fuse/relay box.

   Is the fuse blown?

   YES – Check for a short to body ground in the wire between the under-hood fuse/relay box and the VSA relay, or the VSA relay and modulator unit. If it is OK, replace the fuse, and recheck. ■

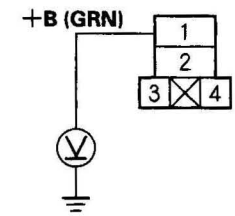
   NO – Go to step 4.
4. Check the VSA relay in the ABS relay box.

   Is the relay OK?

   YES – Go to step 5.

   NO – Replace the VSA relay. ■
5. Remove the VSA relay.
6. Measure the voltage between the VSA relay 4P connector terminal No. 1 and body ground.

   VSA RELAY 4P CONNECTOR



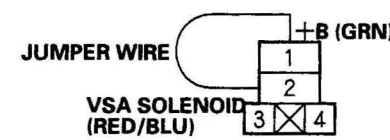
   Wire side of female terminals

   Is there battery voltage?

   YES – Go to step 7.

   NO – Repair open in the wire between the under-hood fuse/relay box and the VSA relay. ■
7. Connect the VSA relay 4P connector terminals No. 1 and No. 2 with a jumper wire.

   VSA RELAY 4P CONNECTOR



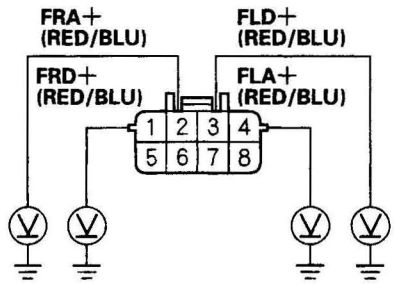
   Wire side of female terminals
8. Disconnect modulator unit connector B (8P).

BACK

Protected by AR

9. Measure the voltage between body ground and modulator unit connector B (8P) terminals No. 1, No. 2, No. 3, and No. 4 individually.

MODULATOR UNIT CONNECTOR B (8P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 10.

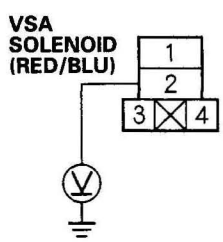
NO – Repair open in the wire between the VSA relay and the modulator unit. ■

10. Remove the jumper wire from the VSA relay 4P connector.

11. Turn the ignition switch ON (II).

12. Measure the voltage between the VSA relay 4P connector terminal No. 2 and body ground.

VSA RELAY 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Repair short to power in the wire between the VSA relay and the VSA control unit. ■

NO – Go to step 13.

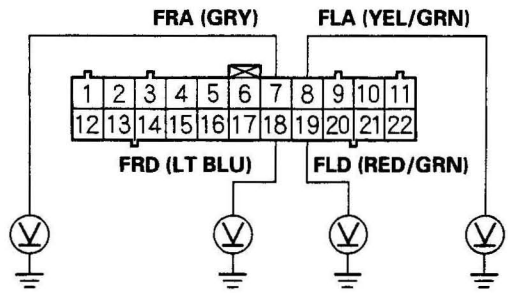
13. Turn the ignition switch OFF.

14. Disconnect VSA control unit connector A (22P).

15. Turn the ignition switch ON (II).

16. Measure the voltage between body ground and VSA control unit connector A (22P) terminals No. 7, No. 8, No. 18, and No. 19 individually.

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there battery voltage?

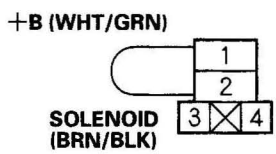
YES – Repair short to power in the wire between the VSA control unit and the modulator unit. ■

NO – Go to step 17.

17. Turn the ignition switch OFF.

18. Connect the fail-safe relay 4P connector terminals No. 1 and No. 2 with a jumper wire.

FAIL-SAFE RELAY 4P CONNECTOR



Wire side of female terminals

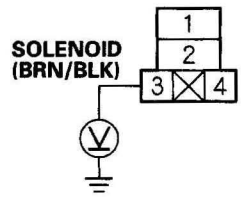
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

19. Measure the voltage between the VSA relay 4P connector terminal No. 3 and body ground.

VSA RELAY 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

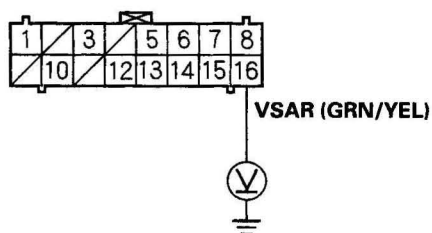
YES – Go to step 20.

NO – Repair open in the wire between the fail-safe relay and the VSA relay. ■

20. Install the VSA relay.

21. Measure the voltage between VSA control unit connector B (16P) terminal No. 16 and body ground.

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there battery voltage?

YES – The system is OK at this time. If the problem recurs, check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – Repair open in the wire between the VSA control unit and the VSA relay. ■

DTC 61, 62: Ignition Voltage

1. Clear the DTC.
2. Test-drive the vehicle at 6 mph (10 km/h) or more.

   Does the ABS indicator come on?

   YES – Go to step 3.

   NO – The system is OK at this time. ■
3. Verify the DTC.

   Is DTC 61 or 62 indicated?

   YES – Check the charging system. ■

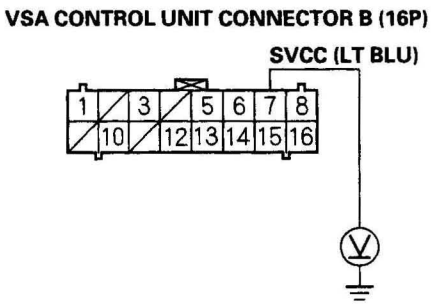
   NO – Do the appropriate troubleshooting for the DTC. ■

BACK

Protected by AR

DTC 64: Sensor Power Source

1. Disconnect VSA control unit connector B (16P), steering angle sensor 5P connector, yaw rate sensor 4P connector, lateral acceleration sensor 3P connector, and VSA-TCS control valve sensor 3P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between VSA control unit connector B (16P) terminal No. 7 and body ground.



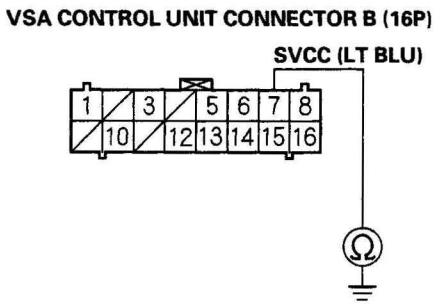
Wire side of female terminals

Is there about 1 V or more?

YES—Repair short to power in the wire between the VSA control unit, steering angle sensor, yaw rate sensor, lateral acceleration sensor, and VSA-TCS control valve sensor. ■

NO—Go to step 4.

4. Check for continuity between VSA control unit connector B (16P) terminal No. 7 and body ground.



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between the VSA control unit, steering angle sensor, yaw rate sensor, lateral acceleration sensor, and VSA-TCS control valve sensor. ■

NO—Go to step 5.

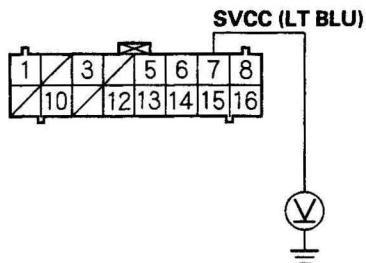
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

5. Turn the ignition switch OFF.
6. Connect VSA control unit connector B (16P).
7. Turn the ignition switch ON (II).
8. Measure the voltage between VSA control unit connector B (16P) terminal No. 7 and body ground.

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

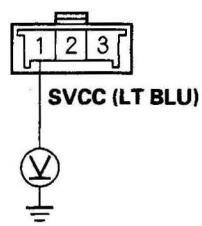
Is there about 5 V?

YES – Go to step 9.

NO – Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

9. Measure the voltage between the lateral acceleration sensor 3P connector terminal No. 1 and body ground.

LATERAL ACCELERATION SENSOR 3P CONNECTOR



Terminal side of male terminals

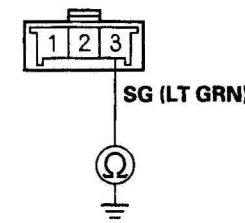
Is there about 5 V?

YES – Go to step 10.

NO – Repair open in the wire between the VSA control unit and the lateral acceleration sensor. ■

10. Turn the ignition switch OFF.
11. Check for continuity between the lateral acceleration sensor 3P connector terminal No. 3 and body ground.

LATERAL ACCELERATION SENSOR 3P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES – The system is OK at this time. If the problem recurs, check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – Repair open in the wire between the VSA control unit and the lateral acceleration sensor. ■

BACK

Protected by AR

DTC 71: Different Diameter Tire

1. Clear the DTC.
2. Test-drive the vehicle.

Does the ABS or VSA system indicator come on and is DTC 71 indicated?

YES – Make sure all four tires are the specified size and properly inflated. ■

NO – Intermittent failure; the vehicle is OK at this time. ■

DTC 72: Modulator Unit

1. Clear the DTC.
2. Test-drive the vehicle at 18 mph (30 km/h) or more.

Does the VSA system indicator come on and is DTC 72 indicated?

YES – Replace the modulator unit. ■

NO – The system is OK at this time. ■

Protected by AR

DTC Troubleshooting (cont'd)

DTC 81: VSA Control Unit

1. Check for other DTCs.

   Are there any other DTCs indicated?

   YES – Do the appropriate troubleshooting for the DTC. ■

   NO – Go to step 2.

2. Clear the DTC.

3. Test-drive the vehicle.

   Does the ABS indicator come on and is DTC 81 indicated?

   YES – Replace the VSA control unit. ■

   NO – Intermittent failure; the vehicle is OK at this time. ■

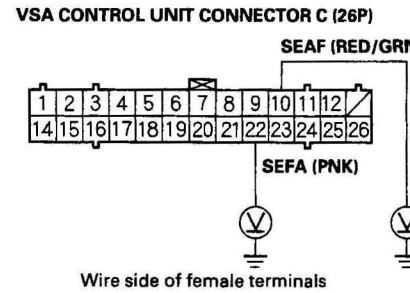
DTC 83: PGM-FI Communication

NOTE: If the VSA indicator and MIL are both ON, troubleshoot the PGM-FI system or automatic transmission system first.

1. Disconnect the VSA control unit connector C (26P) and PCM connector A (32P).

2. Turn the ignition switch ON (II).

3. Measure the voltage between body ground and VSA control unit connector C (26P) terminals No. 10 and No. 22 individually.

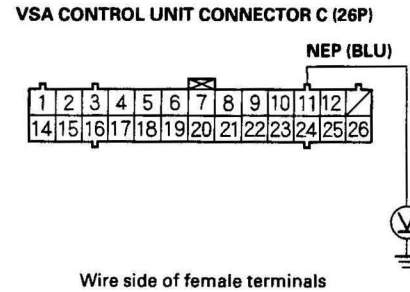


Is there voltage?

YES – Repair short to power in the wire between the VSA control unit and the PCM. ■

NO – Go to step 4.

4. Measure the voltage between VSA control unit connector C (26P) terminal No. 11 and body ground.



Is there voltage?

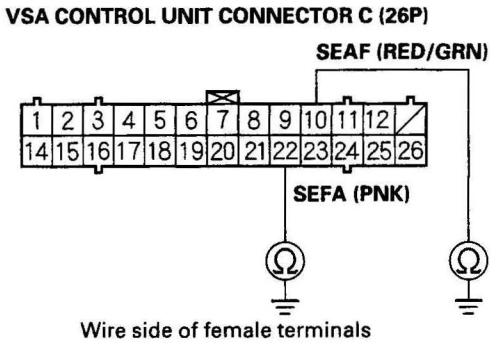
YES – Repair short to power in the wire between the VSA control unit and the PCM. ■

NO – Go to step 5.

BACK

Protected by AR

5. Check for continuity between body ground and VSA control unit connector C (26P) terminals No. 10 and No. 22 individually.

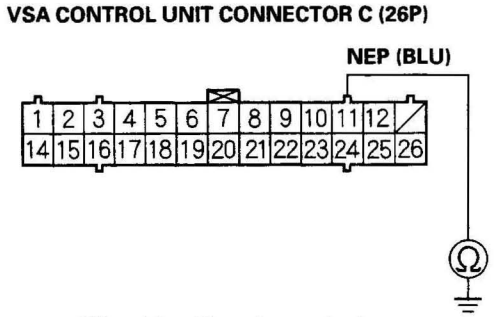


Is there continuity?

YES – Repair short to body ground in the wire between the VSA control unit and the PCM. ■

NO – Go to step 6.

6. Check for continuity between VSA control unit connector C (26P) terminal No. 11 and body ground.

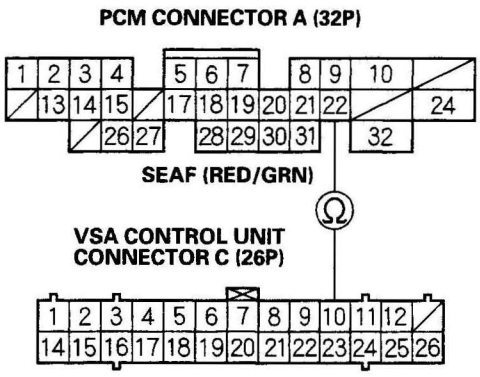


Is there continuity?

YES – Repair short to body ground in the wire between the VSA control unit and the PCM. ■

NO – Go to step 7.

7. Check for continuity between VSA control unit connector C (26P) terminal No. 10 and PCM connector A (32P) terminal No. 22.

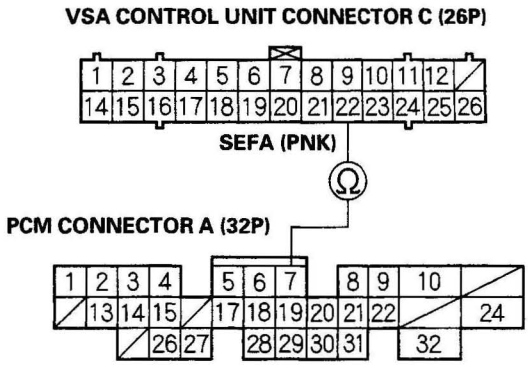


Is there continuity?

YES – Go to step 8.

NO – Repair open in the wire between the VSA control unit and the PCM. ■

8. Check for continuity between VSA control unit connector C (26P) terminal No. 22 and PCM connector A (32P) terminal No. 7.



Is there continuity?

YES – Go to step 9.

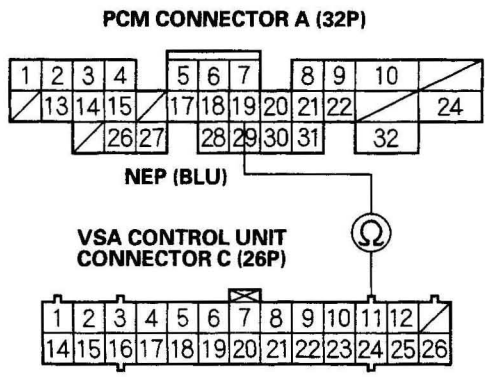
NO – Repair open in the wire between the VSA control unit and the PCM. ■

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

9. Check for continuity between VSA control unit connector C (26P) terminal No. 11 and PCM connector A (32P) terminal No. 19.



Wire side of female terminals

Is there continuity?

YES – Go to step 10.

NO – Repair open in the wire between the VSA control unit and the PCM. ■

10. Check for loose connectors at the PCM and the VSA control unit. If necessary, substitute a known-good VSA control unit, and recheck.

11. Connect all of the disconnected connectors.

12. Do the neutral position memorization (see page 19-189).

13. Test-drive the vehicle around a number of right and left hand corners.

14. Verify the DTC.

Is DTC 83 indicated?

YES – Check for loose PCM connectors. If necessary, substitute a known-good PCM, and recheck. ■

NO – Replace the VSA control unit. ■

DTC 84: Neutral Position

1. Clear the DTC.

2. Do the neutral position memorization (see page 19-189).

3. Test-drive the vehicle at 24 mph (40 km/h) – 36 mph (60 km/h) without wheel spin for 2 – 3 minutes.

Is the VSA activation indicator on or blinking?

YES – Go to step 4.

NO – The system is OK at this time. ■

4. Verify the DTC.

Is DTC 25, 26, or 27 indicated?

YES – Do the appropriate troubleshooting for the DTC, and recheck. ■

NO – Go to step 5.

5. Substitute a known-good lateral acceleration sensor.

6. Do the neutral position memorization (see page 19-189).

7. Test-drive the vehicle at 24 mph (40 km/h) – 36 mph (60 km/h) without wheel spin for 2 – 3 minutes.

Is the VSA activation indicator blinking?

YES – Go to step 8.

NO – Replace the lateral acceleration sensor. ■

8. Substitute a known-good steering angle sensor.

9. Test-drive the vehicle at 24 mph (40 km/h) – 36 mph (60 km/h) without wheel spin for 2 – 3 minutes.

Is the VSA activation indicator blinking?

YES – Replace the yaw rate sensor. ■

NO – Replace the steering angle sensor. ■

BACK

Protected by AR

DTC 93: Throttle Position Sensor

NOTE: If the VSA system indicator and MIL are both ON, troubleshoot the PGM-FI system first.

1. Clear the DTC.
2. Start the engine.
3. Watch the MIL.

   Does the MIL stay on?

   YES – Troubleshoot the PGM-FI system. ■

   NO – Go to step 4.
4. Verify the DTC.

   Is DTC 93 indicated?

   YES – Go to step 5.

   NO – The system is OK at this time. ■
5. Substitute a known-good VSA control unit.
6. Do the neutral position memorization (see page 19-189).
7. Start the engine.
8. Watch the VSA system indicator.

   Does the VSA system indicator stay on?

   YES – Go to step 9.

   NO – Replace the VSA control unit. ■
9. Verify the DTC.

   Is DTC 93 indicated?

   YES – Replace the PCM. ■

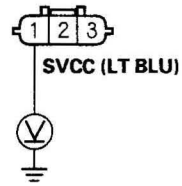
   NO – Troubleshoot the DTC indicated. ■

DTC 94: VSA-TCS Control Valve Sensor

NOTE: If the VSA system indicator and MIL are both ON, troubleshoot the PGM-FI system first.

1. Turn the ignition switch ON (II).
2. Measure the voltage between the VSA-TCS control valve sensor 3P connector terminal No. 1 and body ground.

   VSA-TCS CONTROL VALVE SENSOR 3P CONNECTOR



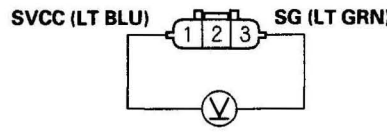
   Wire side of female terminals

   Is there about 5 V?

   YES – Go to step 3.

   NO – Repair open in the wire between the VSA control unit and the VSA-TCS control valve sensor. ■
3. Measure the voltage between the VSA-TCS control valve sensor connector terminals No. 1 and No. 3.

   VSA-TCS CONTROL VALVE SENSOR 3P CONNECTOR



   Wire side of female terminals

   Is there about 5 V?

   YES – Go to step 4.

   NO – Repair open in the wire between the VSA control unit and the VSA-TCS control valve sensor. ■

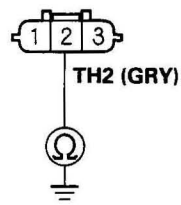
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

4. Turn the ignition switch OFF.
5. Disconnect VSA control unit connector A (22P).
6. Check for continuity between the VSA-TCS control valve sensor 3P connector terminal No. 2 and body ground.

VSA-TCS CONTROL VALVE SENSOR 3P CONNECTOR



Wire side of female terminals

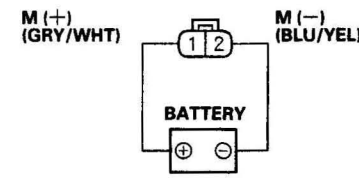
Is there continuity?

YES – Repair short to body ground in the wire between the VSA control unit and the VSA-TCS control valve sensor. ■

NO – Go to step 7.

7. Disconnect the VSA-TCS control valve actuator 2P connector.
8. Connect the VSA control unit connector A (22P) and VSA-TCS control valve sensor 3P connector.
9. Turn the ignition switch ON (II).
10. Connect battery power to the VSA-TCS control valve actuator 2P connector terminal No. 1 and ground connector terminal No. 2 for 1 second.
NOTE:
    - Be careful not to short the terminals.
    - After checking, disconnect the terminals.

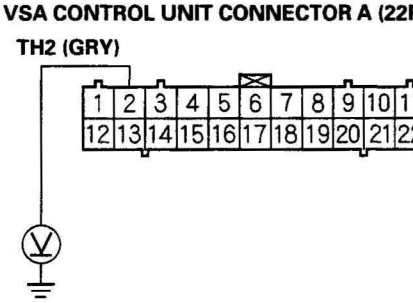
VSA-TCS CONTROL VALVE ACTUATOR 2P CONNECTOR



Wire side of female terminals

11. Measure the voltage between the VSA control unit connector A (22P) terminal No. 2 and body ground.
NOTE:
VSA-TCS control valve is fully closed: about 0.5 V
VSA-TCS control valve is fully open: about 4.5 V
There should be a smooth transition from about 4.5 V to 0.5 V as the VSA-TCS control valve is closed.

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is the voltage within specification?

YES – The system is OK at this time. If the problem recurs, check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – Check for an open in the wire between the VSA control unit and the VSA-TCS control valve sensor. If the wire is OK, replace the VSA-TCS control valve assembly (faulty VSA-TCS control valve sensor), and recheck. ■

BACK

Protected by AR

DTC 97: VSA-TCS Control Valve Actuator

1. Check the VSA TH MOTOR (20A) fuse in the under-hood fuse/relay box, and reinstall the fuse if it is OK.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in the wires between the under-hood fuse/relay box and the sub-throttle motor relay, and between the sub-sthrottle motor relay and VSA control unit. ■

2. Check the sub-throttle motor relay, and leave the relay removed if it is OK.

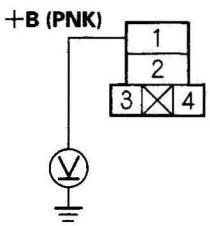
   Is the relay OK?

   YES – Go to step 3.

   NO – Replace the relay, and recheck. ■

3. Measure the voltage between the sub-throttle motor relay 4P connector terminal No. 1 and body ground.

   SUB-THROTTLE MOTOR RELAY 4P CONNECTOR



   Wire side of female terminals

   Is there battery voltage?

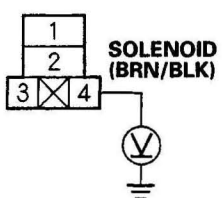
   YES – Go to step 4.

   NO – Repair open in the wire between the under-hood fuse/relay box and the sub-throttle motor relay. ■

4. Turn the ignition switch ON (II).

5. Measure the voltage between the sub-throttle motor relay 4P connector terminal No. 4 and body ground.

   SUB-THROTTLE MOTOR RELAY 4P CONNECTOR



   Wire side of female terminals

   Is there battery voltage?

   YES – Go to step 6.

   NO – Repair open in the wire between the fail-safe relay and the sub-throttle motor relay. ■

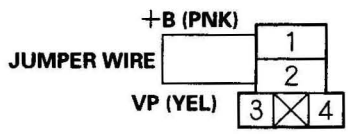
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

6. Turn the ignition switch OFF.
7. Disconnect VSA control unit connector A (22P).
8. Connect the sub-throttle motor relay 4P connector terminals No. 1 and No. 2 with a jumper wire.

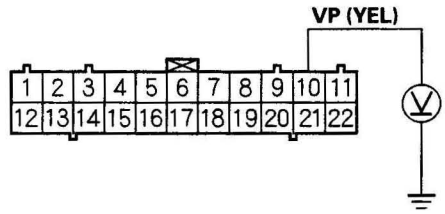
SUB-THROTTLE MOTOR RELAY 4P CONNECTOR



Wire side of female terminals

9. Measure the voltage between VSA control unit connector A (22P) terminal No. 10 and body ground.

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there about 10 V?

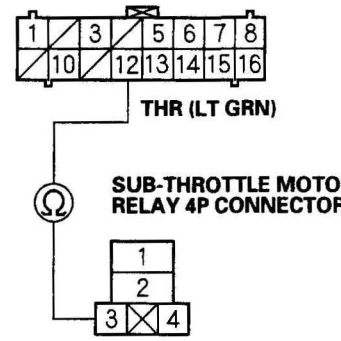
YES – Go to step 10.

NO – Repair open in the wire between the VSA control unit and the sub-throttle motor relay. ■

10. Disconnect VSA control unit connector B (16P), and remove the jumper wire from the sub-throttle motor relay 4P connector.

11. Check for continuity between VSA control unit connector B (16P) terminal No. 12 and sub-throttle motor relay 4P connector terminal No. 3.

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

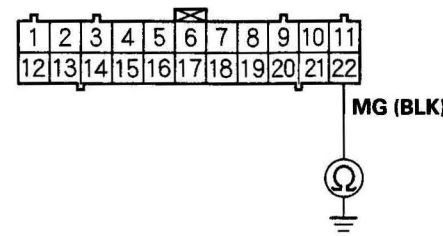
Is there continuity?

YES – Go to step 12.

NO – Repair open in the wire between the VSA control unit and the sub-throttle motor relay. ■

12. Check for continuity between VSA control unit connector A (22P) terminal No. 22 and body ground.

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there continuity?

YES – Go to step 13.

NO – Repair open in the wire between the VSA control unit and body ground. ■

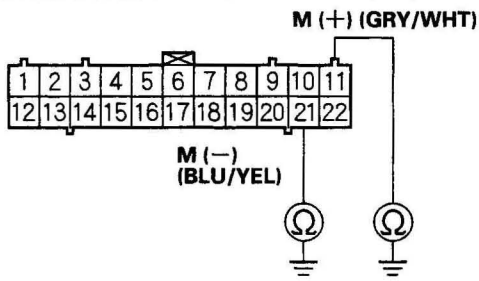
13. Disconnect the VSA-TCS control valve actuator 2P connector.

BACK

Protected by AR

14. Check for continuity between body ground and the VSA control unit connector A (22P) terminals No. 11 and No. 21 individually.

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there continuity?

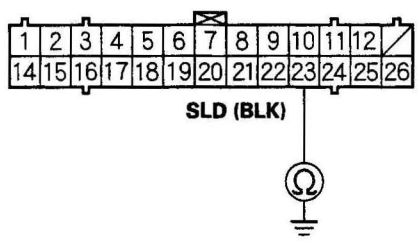
YES – Repair short to body ground in the wire between the VSA control unit and the VSA-TCS control valve actuator. ■

NO – Go to step 15.

15. Reconnect VSA control unit connector A (22P) and connector B (16P).

16. Check for continuity between VSA control unit connector C (26P) terminal No. 23 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there continuity?

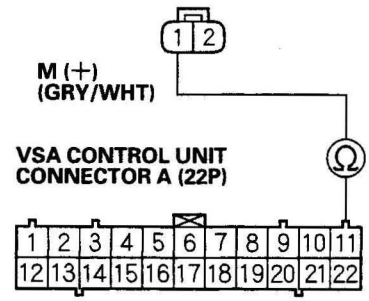
YES – Go to step 17.

NO – Replace the VSA control unit, and recheck. ■

17. Disconnect VSA control unit connector A (22P) and connector B (16P).

18. Check for continuity between VSA control unit connector A (22P) terminal No. 11 and VSA-TCS control valve actuator 2P connector terminal No. 1.

VSA-TCS CONTROL VALVE ACTUATOR 2P CONNECTOR



Wire side of female terminals

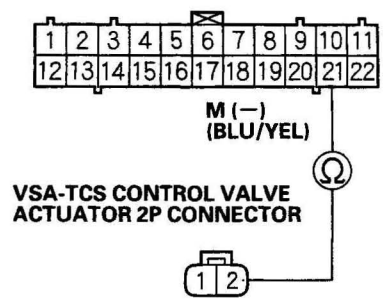
Is there continuity?

YES – Go to step 19.

NO – Repair open in the wire between the VSA control unit and the VSA-TCS control valve actuator. ■

19. Check for continuity between VSA control unit connector A (22P) terminal No. 21 and VSA-TCS control valve actuator 2P connector terminal No. 2.

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

Is there continuity?

YES – Go to step 20.

NO – Repair open in the wire between the VSA control unit and the VSA-TCS control valve actuator. ■

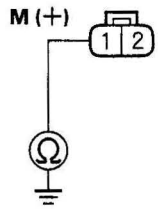
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

20. Check for continuity between the VSA-TCS control valve actuator 2P connector (actuator side) terminal No. 1 and body ground.

VSA-TCS CONTROL VALVE ACTUATOR 2P CONNECTOR



Terminal side of male terminals

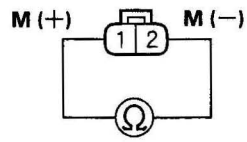
Is there continuity?

YES – Replace the VSA-TCS control valve assembly. ■

NO – Go to step 21.

21. Measure the resistance between the VSA-TCS control valve actuator 2P connector (actuator side) terminals No. 1 and No. 2.

VSA-TCS CONTROL VALVE ACTUATOR 2P CONNECTOR



Terminal side of male terminals

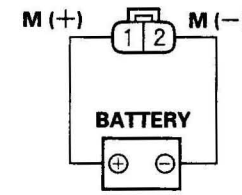
Is there 1.1 to 2.0 Ω ?

YES – Go to step 22.

NO – Replace the VSA-TCS control valve assembly. ■

22. Connect battery power to the TCS control valve actuator 2P connector terminal No. 1, and ground connector terminal No. 2 for 1 second.
NOTE:
- Be careful not to short the terminals.
- After checking, disconnect the terminals.

VSA-TCS CONTROL VALVE ACTUATOR 2P CONNECTOR



Terminal side of male terminals

Does the TCS control valve operate smoothly?

YES – Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – Replace the TCS control valve assembly. ■

BACK

Protected by AR

DTC 101: Barometric Pressure Sensor

NOTE: If the VSA system indicator and the MIL are both ON, troubleshoot the PGM-FI system first.

1. Verify the DTC.

   Is any DTC except DTC 101 indicated?

   YES – Do the appropriate troubleshooting for the DTC. ■

   NO – Go to step 2.

2. Clear the DTC.
3. Substitute a known-good VSA control unit.
4. Do the neutral position memorizing (see page 19-189).
5. Test-drive the vehicle.

   Does the VSA system indicator come on and is DTC 101 indicated?

   YES – Replace the PCM. ■

   NO – Replace the VSA control unit. ■

DTC 111: Sub-Throttle Motor Relay

1. Check the VSA TH MOTOR (20A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   YES – Install the fuse, and go to step 2.

   NO – Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in the wires between the under-hood fuse/relay box and the sub-throttle motor relay, and between the sub-throttle motor relay and the VSA control unit. ■

2. Check the sub-throttle motor relay.

   Is the relay OK?

   YES – With the relay removed, go to step 3.

   NO – Replace the relay, and recheck. ■

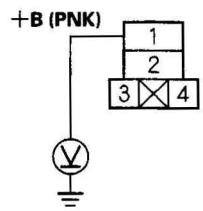
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

3. Measure the voltage between the sub-throttle motor relay 4P connector terminal No. 1 and body ground.

SUB-THROTTLE MOTOR RELAY 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

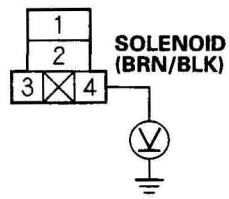
YES – Go to step 4.

NO – Repair open in the wire between the under-hood fuse/relay box and the sub-throttle motor relay. ■

4. Turn the ignition switch ON (II).

5. Measure the voltage between the sub-throttle motor relay 4P connector terminal No. 4 and body ground.

SUB-THROTTLE MOTOR RELAY 4P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 6.

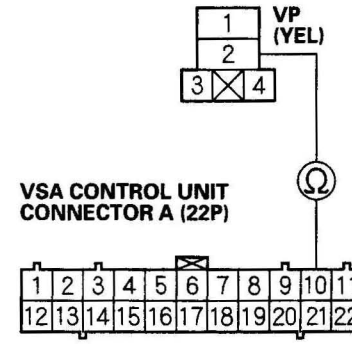
NO – Repair open in the wire between the fail-safe relay and the sub-throttle motor relay. ■

6. Turn the ignition switch OFF.

7. Disconnect VSA control unit connector A (22P).

8. Check for continuity between VSA control unit connector A (22P) terminal No. 10 and sub throttle motor relay 4P connector terminal No. 2.

SUB-THROTTLE MOTOR RELAY 4P CONNECTOR



Wire side of female terminals

Is there continuity?

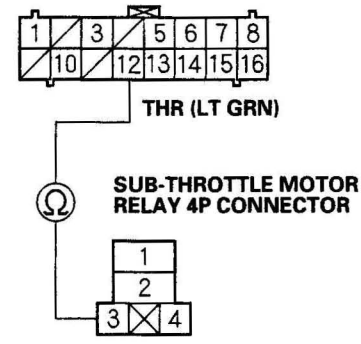
YES – Go to step 9.

NO – Repair open in the wire between the VSA control unit and the sub-throttle motor relay. ■

9. Disconnect VSA control unit connector B (16P).

10. Check for continuity between VSA control unit connector B (16P) terminal No. 12 and sub-throttle motor relay 4P connector terminal No. 3.

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES – Go to step 11.

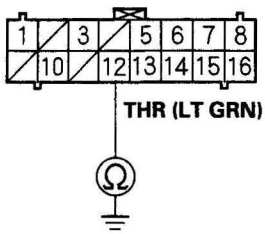
NO – Repair open in the wire between the VSA control unit and the sub-throttle motor relay. ■

BACK

Protected by AR

11. Check for continuity between VSA control unit connector B (16P) terminal No. 12 and body ground.

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES – Repair short to body ground in the wire between the VSA control unit and the sub throttle motor relay. ■

NO – Go to step 12.

12. Install the sub-throttle motor relay.
13. Connect all of disconnected connectors.
14. Do the neutral position memorization (see page 19-189).
15. Test-drive the vehicle.

Does the VSA system indicator come on and is DTC 111 indicated?

YES – Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – The system is OK at this time. ■

ABS Indicator Circuit Troubleshooting

ABS indicator does not come on

1. Turn the ignition switch ON (II), and watch the ABS indicator.

Does the ABS indicator come on?

YES – The system is OK at this time. ■

NO – Go to step 2.

2. Turn the ignition switch OFF, then turn it ON (II) again.

Does the brake system indicator come on?

YES – Go to step 3.

NO – Repair open in the indicator power source circuit. ■
- Blown BACK UP LIGHT (7.5A) fuse.
- Open in the wire between the BACK UP LIGHT (7.5A) fuse and gauge assembly.
- Open circuit inside the fuse box.
- Faulty printed circuit board in the gauge assembly.

3. Turn the ignition switch OFF.
4. Disconnect VSA control unit connector A (22P).
5. Turn the ignition switch ON (II).

Does the ABS indicator come on?

YES – Check for loose terminals in the VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – Go to step 6.

6. Check the ABS indicator bulb in the gauge assembly.

Is the bulb OK?

YES – Go to step 7.

NO – Replace the ABS indicator bulb. ■

7. Turn the ignition switch OFF.
8. Remove the gauge assembly.

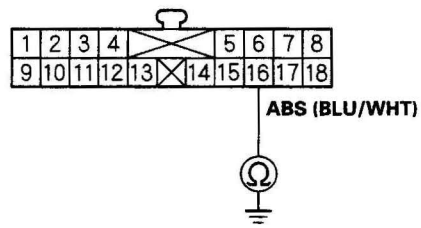
(cont'd)

Protected by AR

ABS Indicator Circuit Troubleshooting (cont'd)

9. Disconnect gauge assembly connector B (18P).
10. Check for continuity between gauge assembly connector B (18P) terminal No. 16 and body ground.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

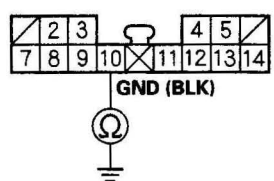
Is there continuity?

YES – Repair short to body ground in the wire between the gauge assembly and the VSA control unit. ■

NO – Go to step 11.

11. Connect gauge assembly connector B (18P), and disconnect gauge assembly connector C (14P).
12. Check for continuity between gauge assembly connector C (14P) terminal No. 10 and body ground.

GAUGE ASSEMBLY CONNECTOR C (14P)



Wire side of female terminals

Is there continuity?

YES – Check for loose terminals in the gauge assembly connectors. If the connectors are OK, replace the printed circuit board in the gauge assembly. ■

NO – Repair open in the wire between the gauge assembly and body ground (G501). ■

ABS indicator does not go off

1. Check the ECU (15A) fuse in the driver's under-dash fuse/relay box, and reinstall the fuse if it is OK.

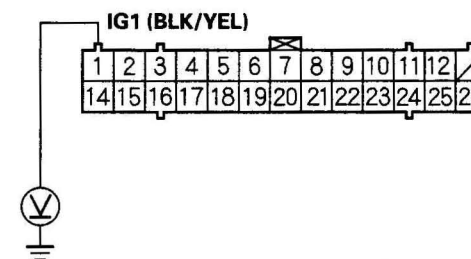
Is the fuse OK?

YES – Go to step 2.

NO – Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in this fuse circuit. If the circuit is OK, check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

2. Disconnect VSA control unit connector C (26P).
3. Turn the ignition switch ON (II).
4. Measure the voltage between the VSA control unit connector C (26P) terminal No. 1 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the VSA control unit and the driver's under-dash fuse/relay box. ■

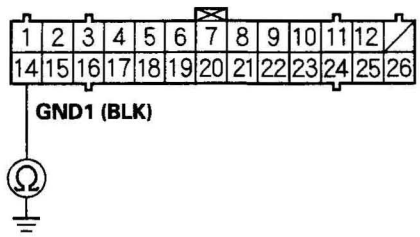
5. Turn the ignition switch OFF.

BACK

Protected by AR

6. Check for continuity between VSA control unit connector C (26P) terminal No. 14 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there continuity?

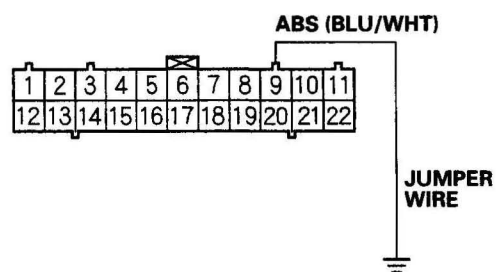
YES – Go to step 7.

NO – Repair open in the wire between the VSA control unit and body ground (G402). ■

7. Turn the ignition switch ON (II).

8. Connect VSA control unit connector A (22P) terminal No. 9 and body ground with a jumper wire.

VSA CONTROL UNIT CONNECTOR A (22P)



Wire side of female terminals

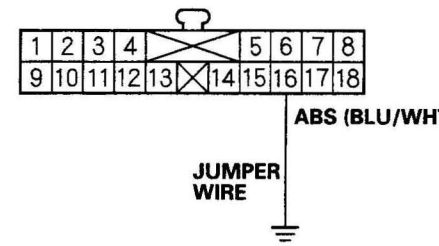
Does the ABS indicator go off?

YES – Check for loose terminals in the VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

NO – Go to step 9.

9. Connect gauge assembly connector B (18P) terminal No. 16 and body ground with a jumper wire.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

Does the ABS indicator go off?

YES – Repair open in the wire between the VSA control unit and the gauge assembly. ■

NO – Check for loose terminals in gauge assembly connector B (18P). If the connector is OK, replace the printed circuit board in the gauge assembly. ■

BACK

Protected by AR

VSA System Indicator Circuit Troubleshooting

VSA system indicator does not come on

1. Turn the ignition switch ON (II), and watch the VSA system indicator.

   Does the VSA system indicator come on?

   YES – The system is OK at this time.■

   NO – Go to step 2.

2. Turn the ignition switch OFF, then turn it ON (II) again.

   Does the brake system indicator come on?

   YES – Go to step 3.

   NO – Repair open in the indicator power source circuit.■
   - Blown BACK UP LIGHT (7.5A) fuse.
   - Open in the wire between the BACK UP LIGHT (7.5A) fuse and gauge assembly.
   - Open circuit inside the fuse box.
   - Open on the printed circuit board in the gauge assembly.

3. Turn the ignition switch OFF.

4. Disconnect VSA control unit connector B (16P).

5. Turn the ignition switch ON (II).

   Does the VSA system indicator come on?

   YES – Check for loose terminals in the VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck.■

   NO – Go to step 6.

6. Check the VSA system indicator bulb in the gauge assembly.

   Is the bulb OK?

   YES – Go to step 7.

   NO – Replace the VSA system indicator bulb.■

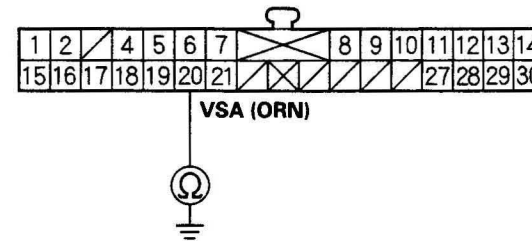
7. Turn the ignition switch OFF.

8. Remove the gauge assembly.

9. Disconnect gauge assembly connector A (30P).

10. Check for continuity between gauge assembly connector A (30P) terminal No. 20 and body ground.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

Is there continuity?

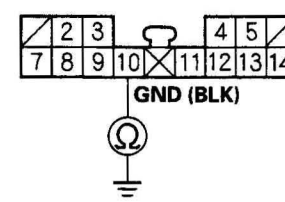
YES – Repair short to body ground in the wire between the gauge assembly and the VSA control unit.■

NO – Go to step 11.

11. Connect gauge assembly connector A (30P), and disconnect gauge assembly connector C (14P).

12. Check for continuity between gauge assembly connector C (14P) terminal No. 10 and body ground.

GAUGE ASSEMBLY CONNECTOR C (14P)



Wire side of female terminals

Is there continuity?

YES – Check for loose terminals in the gauge assembly connectors. If the connectors are OK, replace the printed circuit board in the gauge assembly.■

NO – Repair open in the wire between the gauge assembly and body ground (G501).■

BACK

Protected by AR

VSA system indicator does not go off

1. Check the ECU (15A) fuse in the driver's under-dash fuse/relay box, and reinstall the fuse if it is OK.

   Is the fuse OK?

   YES – Go to step 2.

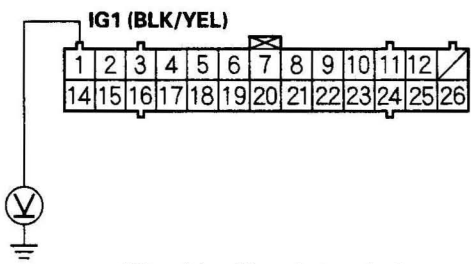
   NO – Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in this fuse circuit. If the circuit is OK, check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

2. Disconnect VSA control unit connector C (26P).

3. Turn the ignition switch ON (II).

4. Measure the voltage between VSA control unit connector C (26P) terminal No. 1 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there battery voltage?

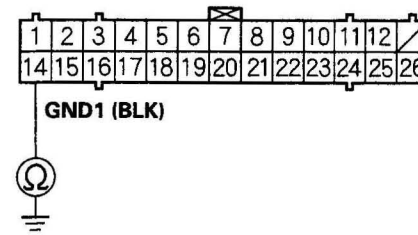
YES – Go to step 5.

NO – Repair open in the wire between the VSA control unit and the driver's under-dash fuse/relay box. ■

5. Turn the ignition switch OFF.

6. Check for continuity between VSA control unit connector C (26P) terminal No. 14 and body ground.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Is there continuity?

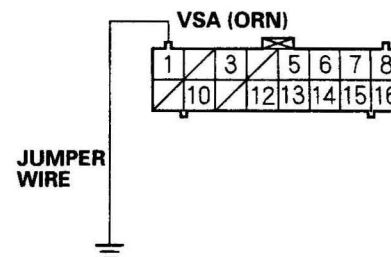
YES – Go to step 7.

NO – Repair open in the wire between the VSA control unit and body groud (G402). ■

7. Turn the ignition switch ON (II).

8. Connect VSA control unit connector B (16P) terminal No. 1 and body ground with a jumper wire.

VSA CONTROL UNIT CONNECTOR B (16P)



Wire side of female terminals

Does the VSA system indicator go off?

YES – Check for loose terminals in the VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

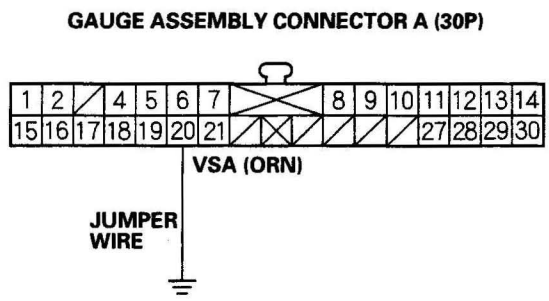
NO – Go to step 9.

(cont'd)

Protected by AR

VSA System Indicator Circuit Troubleshooting (cont'd)

9. Connect gauge assembly connector A (30P) terminal No. 20 and body ground with a jumper wire.



Does the VSA system indicator go off?

YES – Repair open in the wire between the VSA control unit and the gauge assembly. ■

NO – Check for loose terminals in gauge assembly connector A (30P). If the connector is OK, replace the printed circuit board in the gauge assembly. ■

VSA Activation Indicator Circuit Troubleshooting

VSA activation indicator does not come on

1. Turn the ignition switch ON (II), and watch the VSA activation indicator.

   Does the VSA activation indicator come on?

   YES – The system is OK at this time. ■

   NO – Go to step 2.

2. Turn the ignition switch OFF, then turn it ON (II) again.

   Does the brake system indicator come on?

   YES – Go to step 3.

   NO – Repair open in the indicator power source circuit. ■
   - Blown BACK UP LIGHT (7.5A) fuse.
   - Open in the wire between the BACK UP LIGHT (7.5A) fuse and gauge assembly.
   - Open circuit inside the fuse box.
   - Open on the printed circuit board in the gauge assembly.

3. Check the VSA activation indicator bulb in the gauge assembly.

   Is the bulb OK?

   YES – Go to step 4.

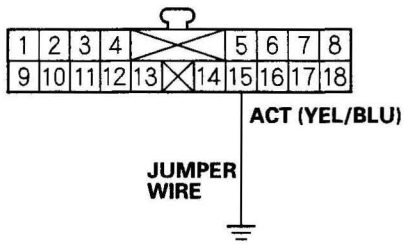
   NO – Replace the VSA activation indicator bulb. ■

BACK

Protected by AR

4. Connect gauge assembly connector B (18P) terminal No. 15 and body ground with a jumper wire.

GAUGE ASSEMBLY CONNECTOR B (18P)



Wire side of female terminals

Does the VSA activation indicator come on?

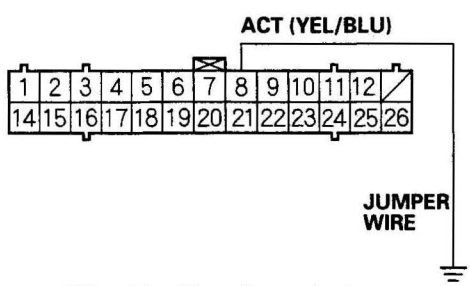
YES – Go to step 5.

NO – Replace the printed circuit board in the gauge assembly. ■

5. Remove the jumper wire from gauge assembly connector B (18P).

6. Connect VSA control unit connector C (26P) terminal No. 8 and body ground with a jumper wire.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Does the VSA activation indicator come on?

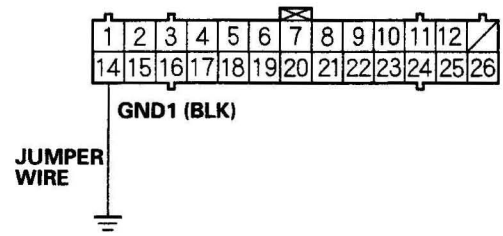
YES – Go to step 7.

NO – Repair open in the wire between the VSA control unit and the gauge assembly. ■

7. Remove the jumper wire from VSA control unit connector C (26P).

8. Connect VSA control unit connector C (26P) terminal No. 14 and body ground with a jumper wire.

VSA CONTROL UNIT CONNECTOR C (26P)



Wire side of female terminals

Does the VSA activation indicator come on?

YES – Repair open in the wire between the VSA control unit and body ground (G402). ■

NO – Check for loose VSA control unit connectors. If necessary, substitute a known-good VSA control unit, and recheck. ■

(cont'd)

Protected by AR

VSA Activation Indicator Circuit Troubleshooting (cont'd)

VSA activation indicator does not go off

1. Do the neutral position memorization (see page 19-189).
2. Turn the ignition switch ON (II).

   Does the VSA activation indicator go off?

   YES – The system is OK at this time. ■

   NO – Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect VSA control unit connector C (26P).

   Does the VSA activation indicator go off?

   YES – Replace the VSA control unit. ■

   NO – Repair short to body ground in the wire between the VSA control unit and the gauge assembly. If the wire is OK, replace the gauge assembly printed circuit board. ■

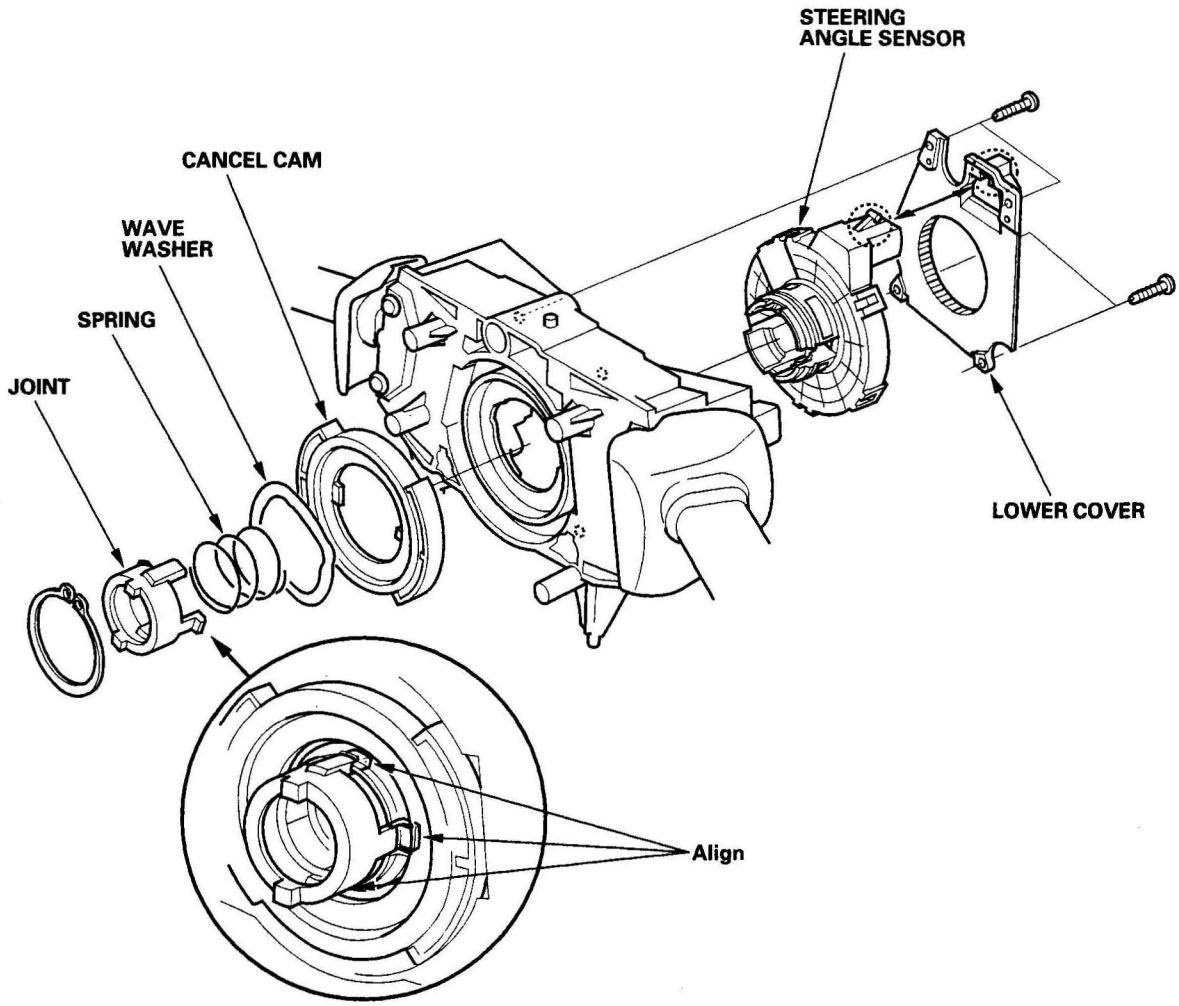
BACK

Protected by AR

Steering Angle Sensor Replacement

NOTE: Do not damage or drop the steering angle sensor as it is sensitive.

1. Remove the combination light switch.
2. Remove the circlip and screws, then remove the steering angle sensor from the combination switch.



3. Install the sensor in the reverse order of removal.

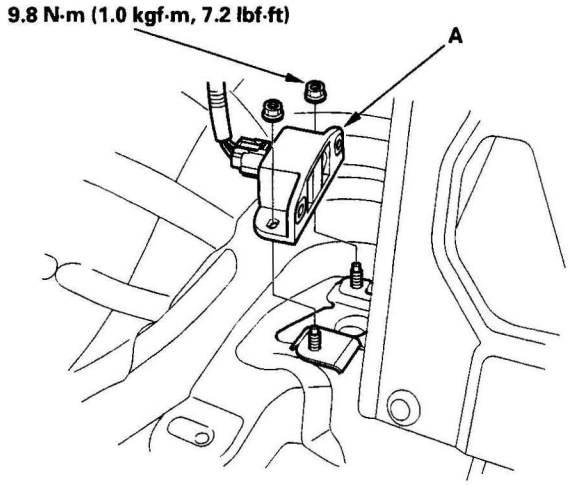
   NOTE: Do not apply any grease or oil to the steering angle sensor.

Protected by AR

Yaw Rate Sensor Replacement

NOTE:
- Do not damage or drop the sensor as it is sensitive.
- Do not use an impact wrench.

1. Remove the seat-back.
2. Remove the yaw rate sensor (A).

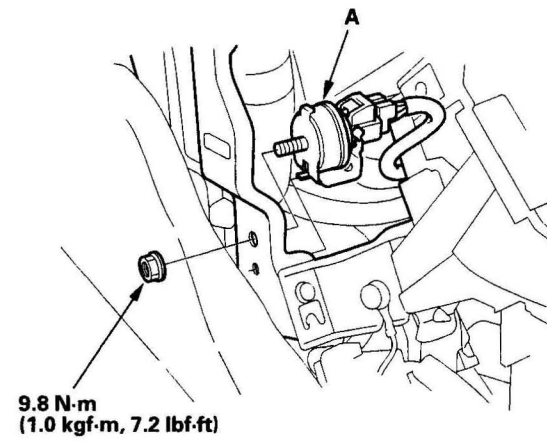


3. Install the sensor in the reverse order of removal.
4. Do the neutral position memorization (see page 19-189).

Lateral Acceleration Sensor Inspection

NOTE:
- Do not damage or drop the sensor as it is sensitive.
- Do not use an impact wrench.
- For an acurate reading, the vehicle must be level.

1. Remove the center console panel.
2. Remove the lateral acceleration sensor (A) from the left lower side with the connector connected.



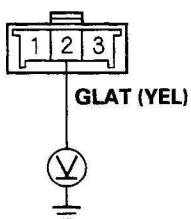
BACK

Protected by AR

3. Turn the ignition switch ON (II).

4. Measure the voltage between the lateral acceleration sensor 3P connector terminal No. 2 and body ground.
   - When the connector side is level, the voltage is about 2.5 V.
   - When the connector side is facing up, the voltage is about 3.5 V.
   - When the connector side is facing down, the voltage is about 1.5 V.

LATERAL ACCELERATION SENSOR 3P CONNECTOR



Terminal side of male terminals

5. If the voltage is not as specified, replace the lateral acceleration sensor.

6. After replacing the lateral acceleration sensor, do the neutral position memorization (see page 19-189).

Neutral Position Memorization

NOTE: To ensure accuracy, the vehicle must be level.

1. Clear the DTC.

2. Short the Service Check Signal circuit (see page 19-110).

3. Release the parking brake.

4. Press the brake pedal, and hold it.

5. Turn the ignition switch ON (II).

6. After the ABS indicator goes off, apply the parking brake, release the parking brake, and apply it again.

7. The VSA activation indicator blinks twice in 2 seconds, and the indicator goes off. If the indicator does not go off, repeat from step 1.

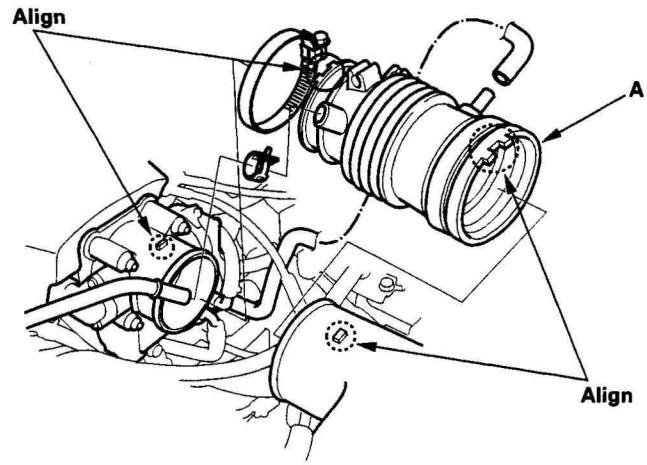
8. Turn the ignition switch OFF, then remove the Honda PGM Tester from the data link connector.

Protected by AR

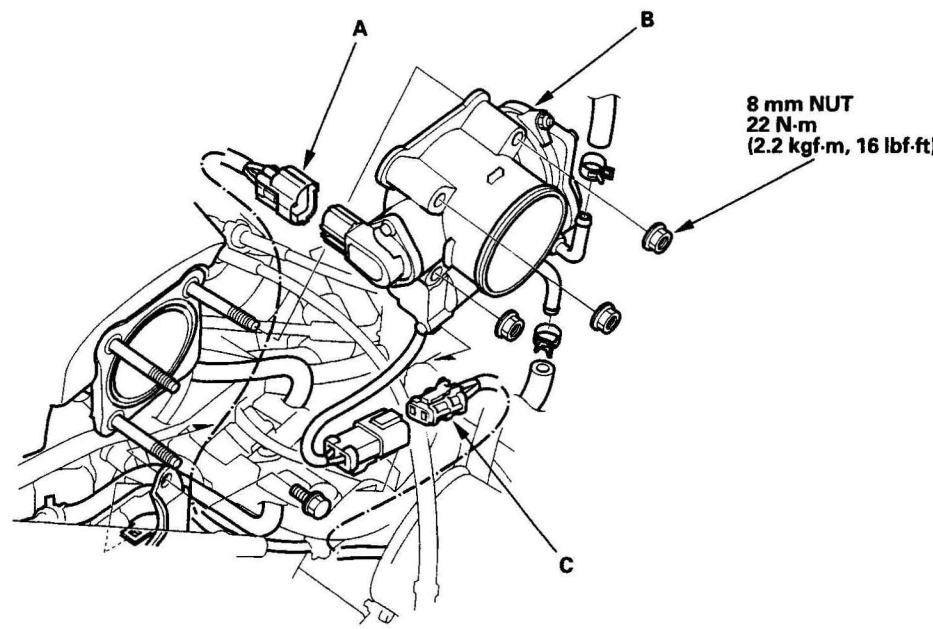
VSA-TCS Control Valve Assembly Replacement

NOTE: Be careful not to damage the TCS control valve when handling the TCS control valve assembly.

1. Remove the battery.
2. Remove the intake air duct (A).



3. Disconnect the TCS control valve sensor 3P connector (A) and TCS control valve actuator 2P connector (C), then remove the TCS control valve assembly.



4. Install the TCS control valve assembly in the reverse order of removal.

BACK

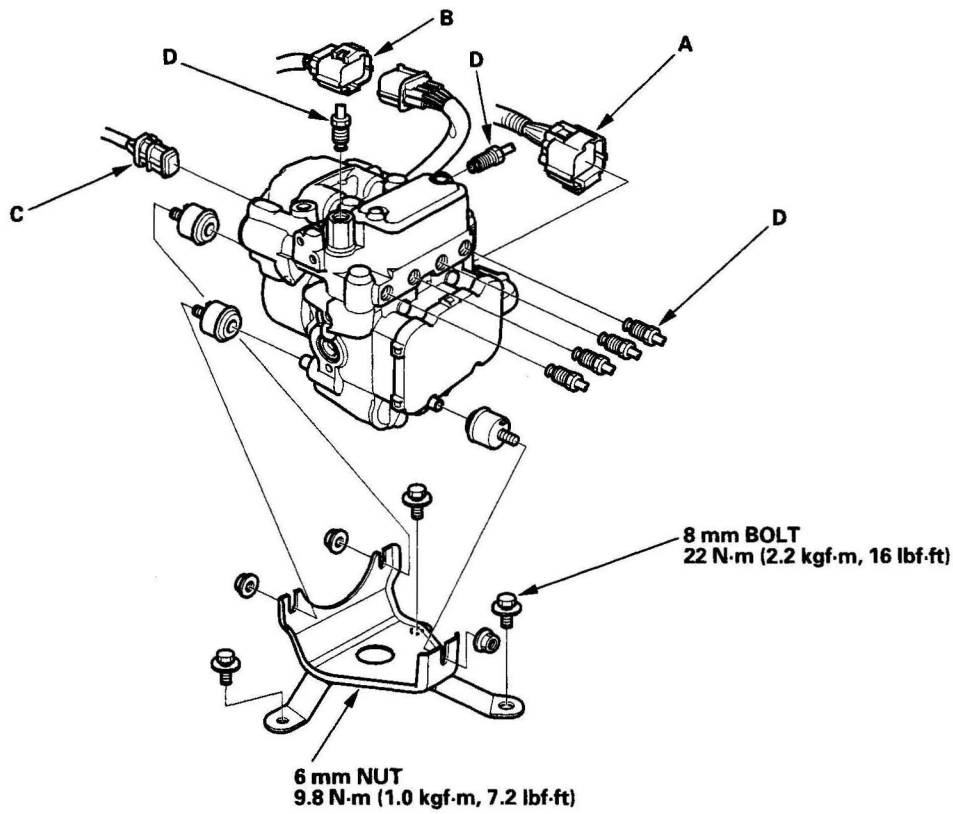
Protected by AR

Modulator Unit Removal and Installation

NOTE:
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- Take care not to damage or deform the brake lines during removal and installation.
- To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.

Removal

1. Disconnect modulator unit connector A (10P), connector B (8P) and the pump motor 2P connector (C).



2. Disconnect the six brake lines (D), then remove the modulator unit.

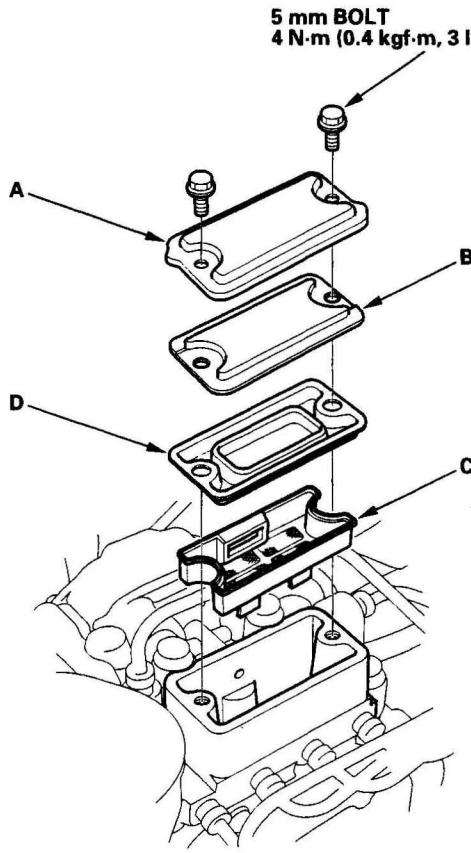
Installation

1. Install the modulator unit in the reverse order of removal.
2. Bleed the brake system, starting with the front wheels.
3. Start the engine, and check that the ABS indicator and VSA system indicator go off.
4. Test-drive the vehicle, and check that the ABS indicator and VSA system indicator do not come on.

Protected by AR

VSA Modulator Fluid Replacement

1. Clean the area around of the modulator unit.
2. Remove the reservoir cap (A), diaphragm plate (B), filter (C), and diaphragm (D).



3. Clean the filter.
4. Remove the brake fluid from the VSA reservoir.

   NOTE: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.

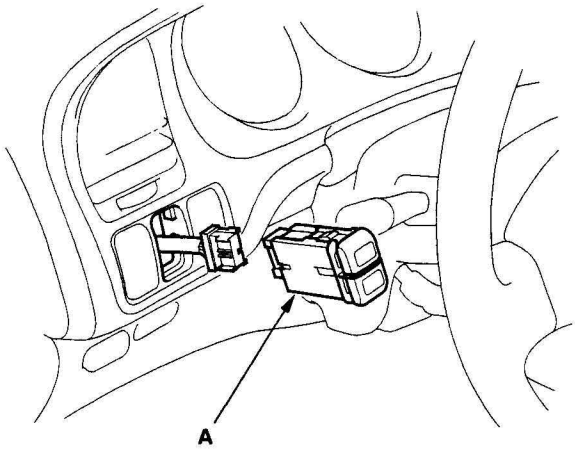
5. Install the filter.
6. Fill the VSA reservoir with brake fluid until it reaches the upper line of the filter.
7. Install the diaphragm, diaphragm plate, and reservoir cap, then hand-tighten the bolts.
8. Operate the pump motor by driving the vehicle at 6 mph (10 km/h) or more.
9. Repeat steps 1 through 8.
10. Test-drive the vehicle at 18 mph (30 km/h) or more for the few seconds, and check that the ABS indicator and VSA system indicator do not come on.
11. Tighten the VSA reservoir cap bolts to the specified torque.

BACK

Protected by AR

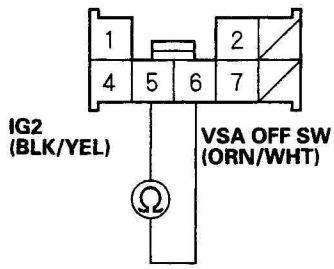
VSA Off Switch Test

1. Remove the cruise control/VSA off switch (A) from the switch panel.



2. Check for continuity between terminal No. 5 and No. 6. There should be continuity when the VSA off switch is pushed.

CRUISE CONTROL/TCS SWITCH CONNECTOR



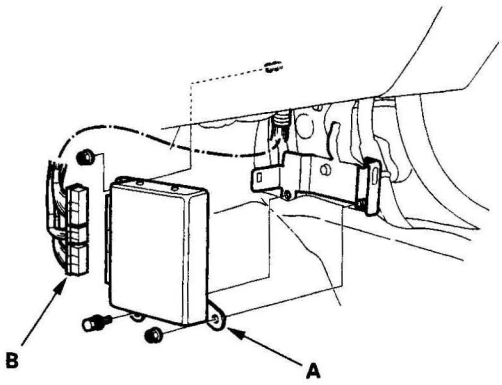
Wire side of female terminals

Protected by AR

VSA System Components

VSA Control Unit Replacement

1. Remove the passenger's kick panel.
2. Remove the VSA control unit (A).



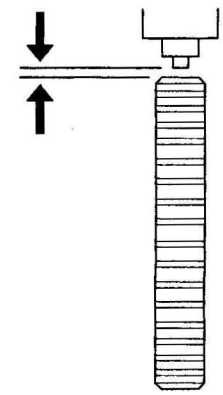
3. Disconnect the VSA control unit connectors (B).
4. Install the VSA control unit in the reverse order of removal.
5. Do the neutral position memorization (see page 19-189).

Wheel Sensor Inspection

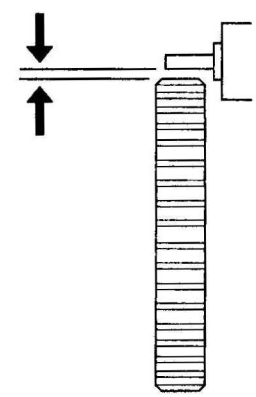
1. Inspect the front and rear pulsers for chipped or damaged teeth.
2. Measure the air gap between the wheel sensor and pulser all the way around while rotating the pulser. Remove the rear brake disc to measure the gap on the rear wheel sensor. If the gap exceeds 1.0 mm (0.04 in), check for a bent suspension arm.

Standard:
Front: 0.4—1.05 mm (0.02—0.04 in)
Rear: 0.19—1.14 mm (0.01—0.05 in)

Front



Rear



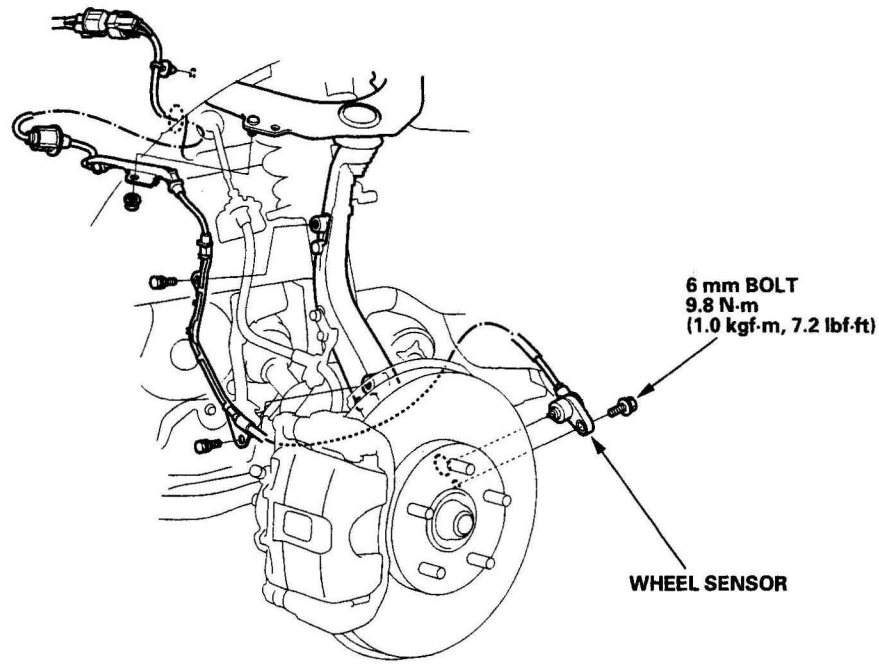
BACK

Protected by AR

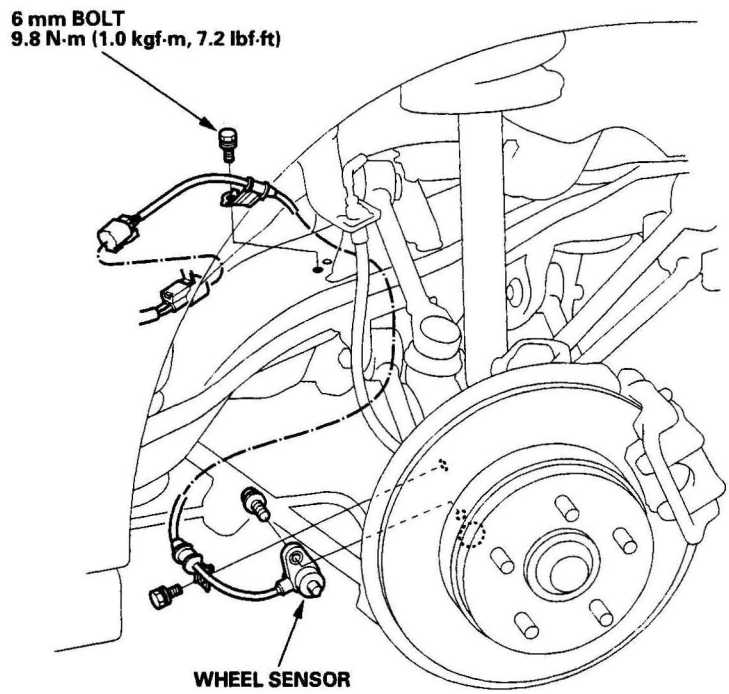
Wheel Sensor Replacement

Install the sensors carefully to avoid twisting wires.

Front



Rear



Protected by AR

Body

Door
Component Location Index-Front Door 20-2
Component Location Index-Rear Door 20-4
Front Door Panel Removal/ Installation 20-6
Front Door Outer Handle Replacement 20-7
Front Door Latch Replacement 20-10
Front Door Glass and Regulator Replacement 20-11
Rear Door Panel Removal/ Installation 20-12
Rear Door Outer Handle Replacement 20-14
Rear Door Latch Replacement 20-15
Rear Door Glass, Quarter Glass, and Regulator Replacement 20-16
Rear Door Hook Pin and Catch Replacement 20-20
Front and Rear Door Glass Adjustment 20-20
Front and Rear Door Position Adjustment 20-22
Front and Rear Door Striker Adjustment 20-23

Mirrors
Component Location Index 20-24
Power Mirror Replacement 20-25
Mirror Holder Replacement 20-26
Rearview Mirror Replacement 20-27

Glass
Component Location Index 20-29
Windshield Replacement 20-30
Rear Window Replacement 20-36

Moonroof
Component Location Index 20-42
Symptom Troubleshooting Index 20-43
Glass Height Adjustment 20-44
Glass Replacement 20-44
Drain Channel Replacement 20-45
Sunshade Replacement 20-46
Motor Replacement 20-47
Frame and Drain Tube Replacement 20-48
Drain Channel Slider and Cable Assembly Replacement 20-50
Limit Switch Adjustment 20-52
Closing Force and Opening Drag Check 20-53

*Interior Trim
Component Location Index 20-54
Trim Removal/Installation-Door Area 20-55
Trim Removal/Installation -Rear Shelf Area 20-56
Trim Removal/Installation-Trunk Area 20-58
Headliner Removal/Installation 20-59
Carpet Replacement 20-61

Console
Rear Console Removal/Installation 20-62
Console Panel Removal/Installation 20-63

*Dashboard
Instrument Panel Removal/ Installation 20-65
Dashboard Lower Cover Removal/Installation 20-65
Glove Box Removal/Installation 20-66
Passenger's Center Vent Removal and Installation 20-68
Passenger's Side Vent Removal and Installation 20-68
Side Defogger Vent Trim Removal and Installation 20-69
Dashboard Removal/Installation 20-70
Steering Hanger Beam Replacement 20-74

Seats
Component Location Index 20-77
Front Seat Removal/Installation 20-78
Front Seat Disassembly/ Reassembly-4-way Power 20-80
Front Seat Disassembly/ Reassembly-8-way Power 20-82
Front Seat Wire Harness Installation 20-84
Front Seat Linkage Disassembly/ Reassembly-4-way Power 20-88
Front Seat Linkage Disassembly/ Reassembly-8-way Power 20-89
Front Seat Cover Replacement 20-90
Rear Seat Removal/Installation 20-95
Rear Seat Armrest Replacement 20-96
Trunk Pass-through Cover Key Cylinder Replacement 20-97
Rear Seat-back Cover Replacement 20-98
Rear Seat Cushion Cover Replacement 20-99

Bumpers
Front Bumper Removal/Installation 20-101
Front Bumper Disassembly/ Reassembly 20-105
Rear Bumper Removal/Installation 20-106

Hood
Replacement 20-108
Adjustment 20-109
Hood Insulator Replacement 20-112
Hood Seal Replacement 20-113

Trunk Lid
Replacement 20-114
Adjustment 20-116
Trunk Lid Torsion Bar Replacement 20-117
Trunk Lid Weatherstrip Replacement 20-118
Trunk Lid Dynamic Damper Replacement ... 20-119

Exterior Trim
Hood Molding Replacement 20-120
Front Grille Replacement 20-120
Front Grille Disassembly/ Reassembly 20-122
Emblem Replacement 20-124
Roof Molding Replacement 20-125
Roof Drip and Rear Pillar Moldings Replacement 20-126
Fender/Door Moldings Replacement 20-127
Side Sill Panel Replacement 20-128

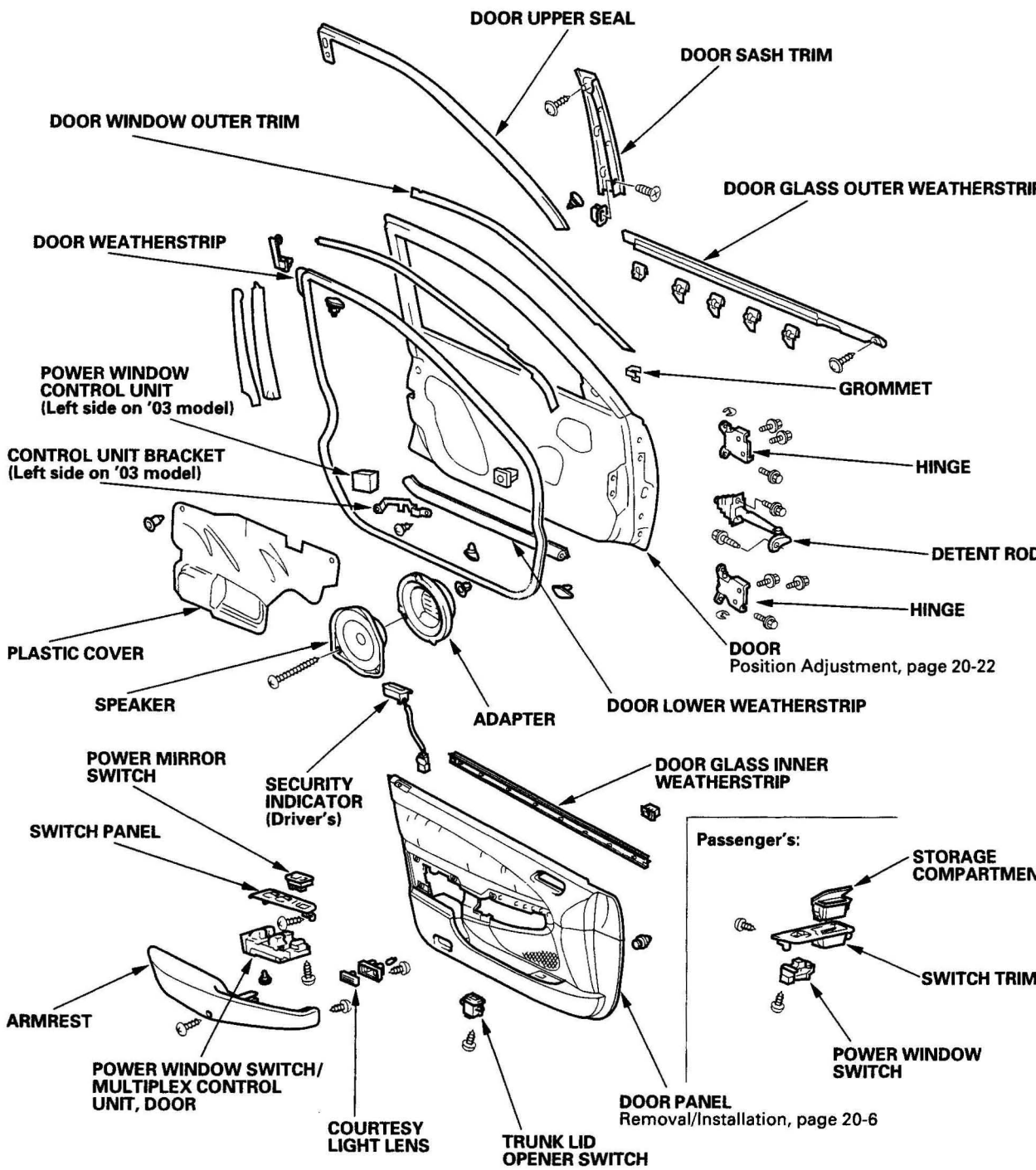
Fenderwell
Inner Fender Replacement 20-129
Fuel Pipe Protector Replacement 20-130
Rear Air Outlet Replacement 20-130

Openers
Component Location Index 20-131
Hood Opener Cable Replacement 20-132
Fuel Fill Door Opener Cable Replacement 20-133
Trunk Lid Opener Cable Replacement 20-134
Hood Release Handle Replacement 20-135
Hood Latch Replacement 20-135
Fuel Fill Door Opener Replacement 20-137
Fuel Fill Door Latch Replacement 20-138
Trunk Lid Latch Replacement 20-139

Frame
Subframe Replacement 20-140
* Frame Repair Chart 20-142

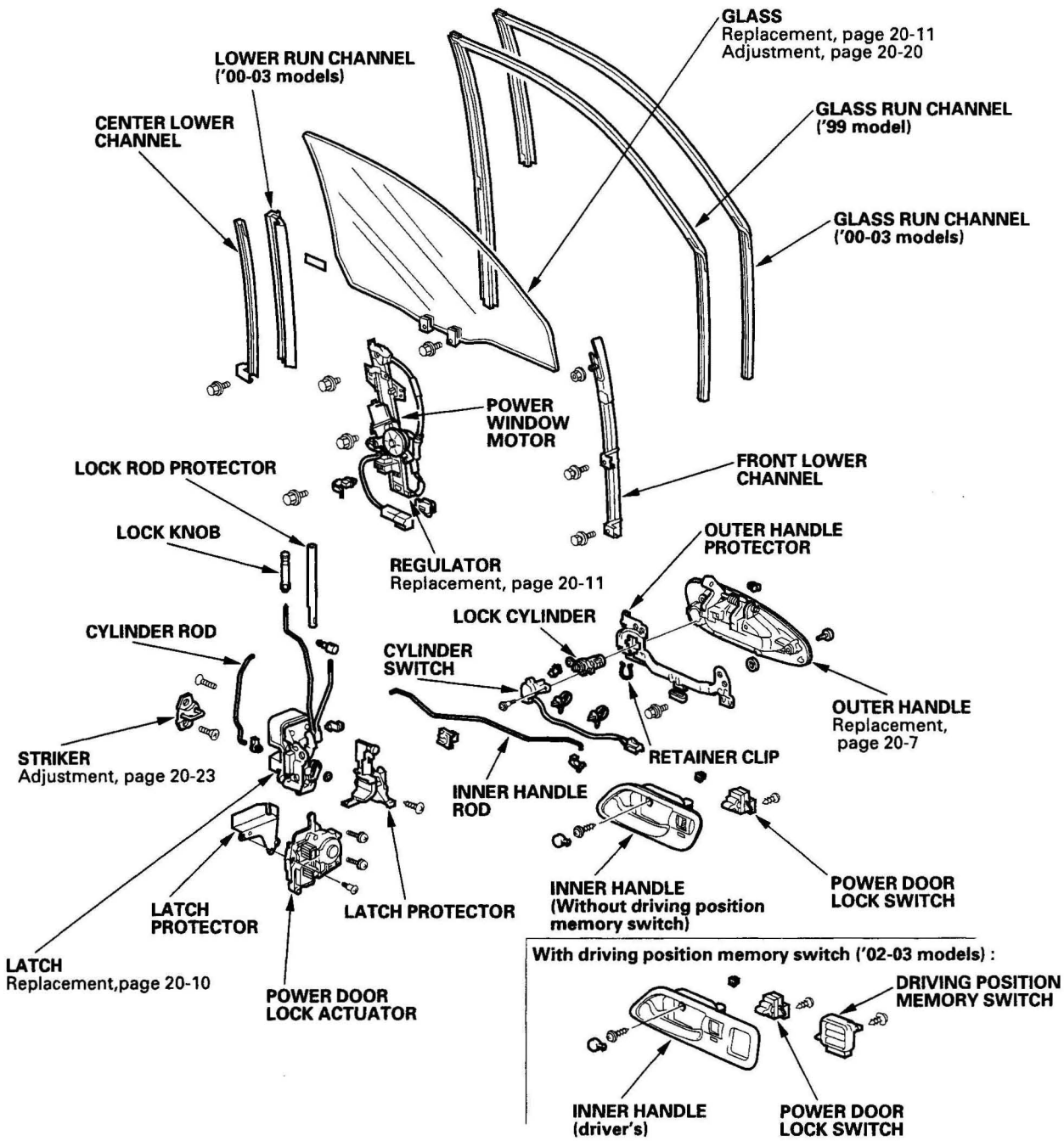
Protected by AR

Component Location Index - Front Door



BACK

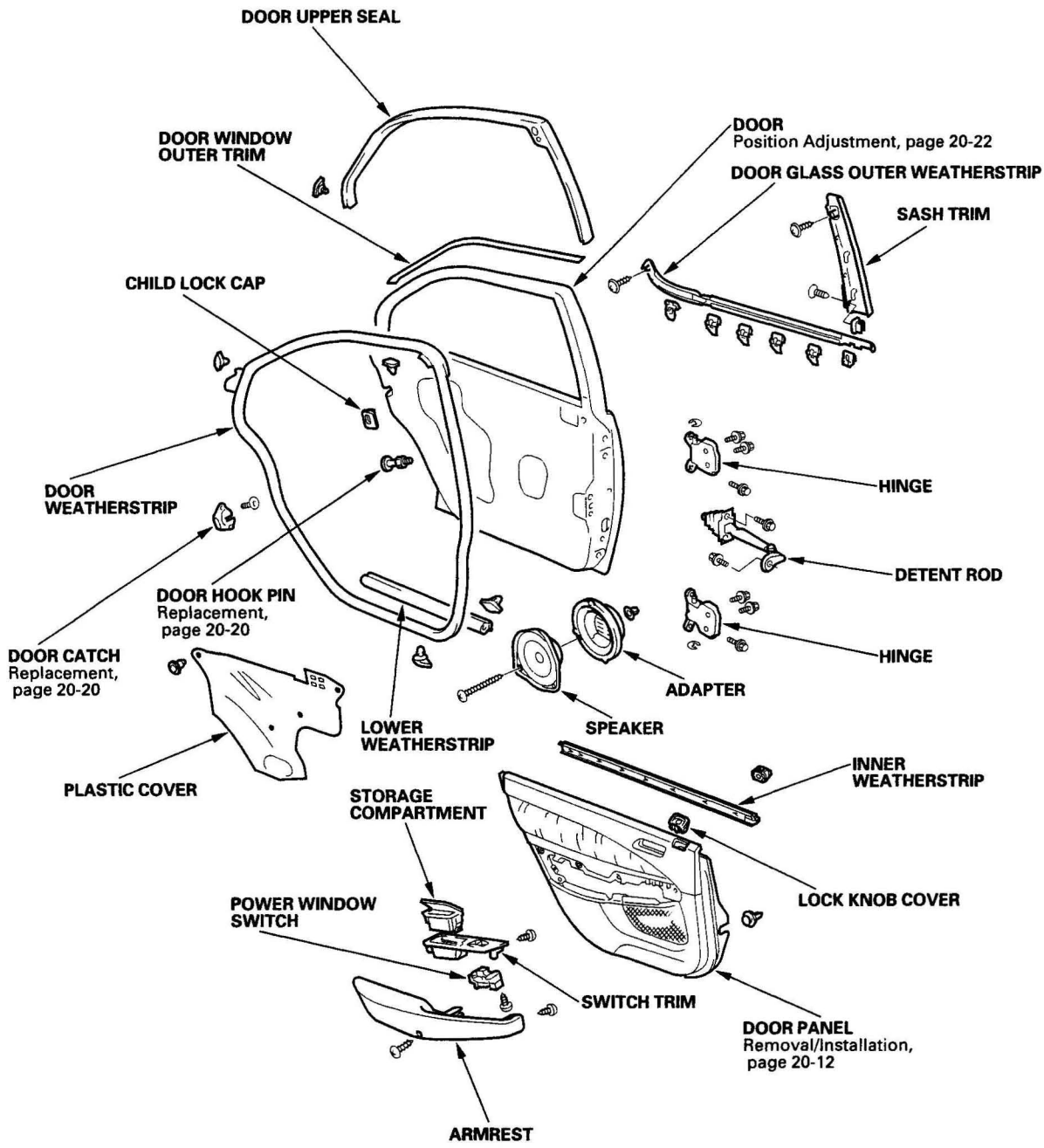
Protected by AR



BACK

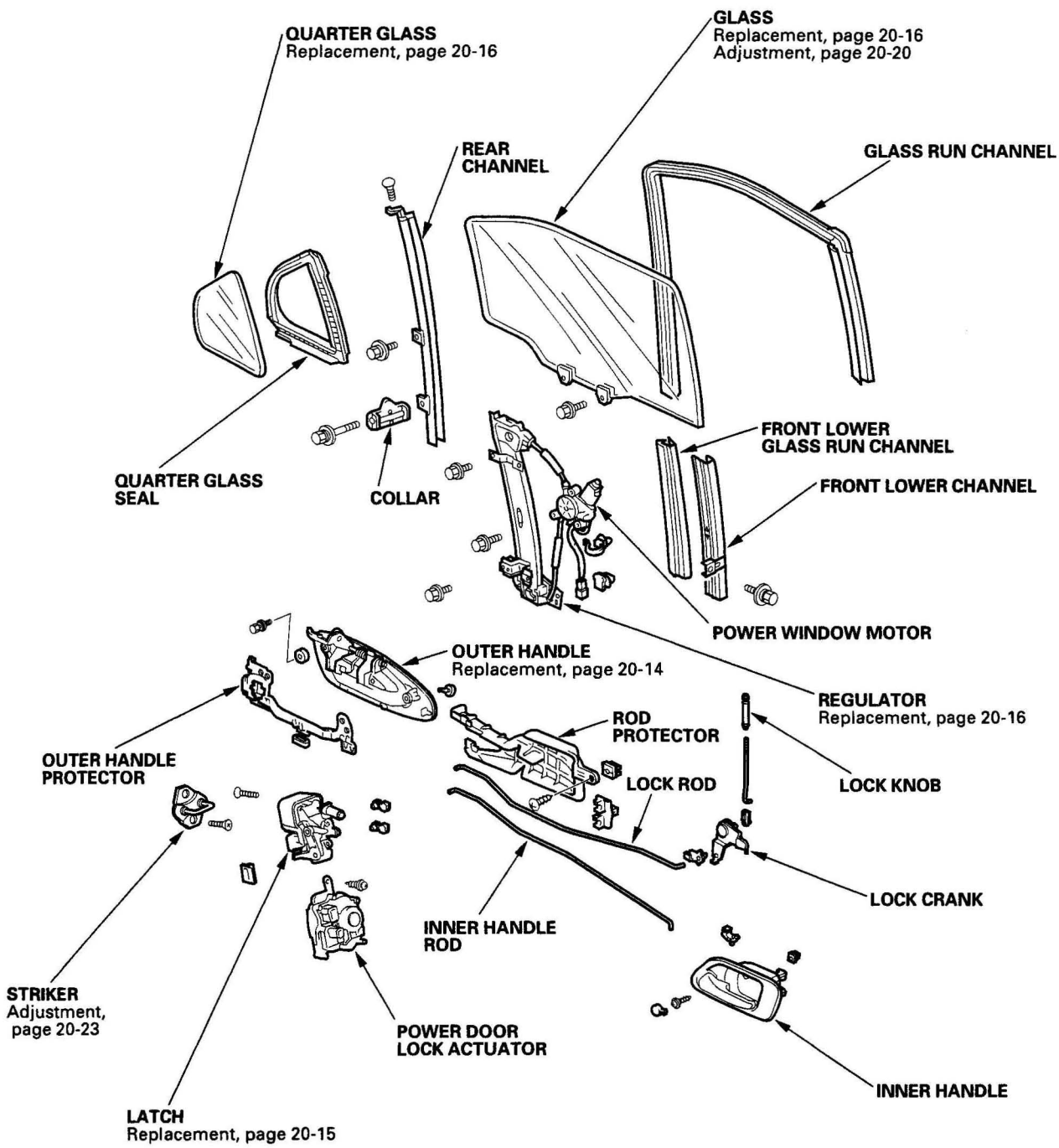
Protected by AR

Component Location Index - Rear Door



BACK

Protected by AR



BACK

Protected by AR

Front Door Panel Removal/Installation

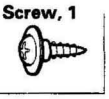
Special Tool Required
Trim pad remover, Snap-on A177A or equivalent, commercially available.

1. Remove the mirror mount cover (see step 2 on page 20-25). Take care not to scratch the door panel.

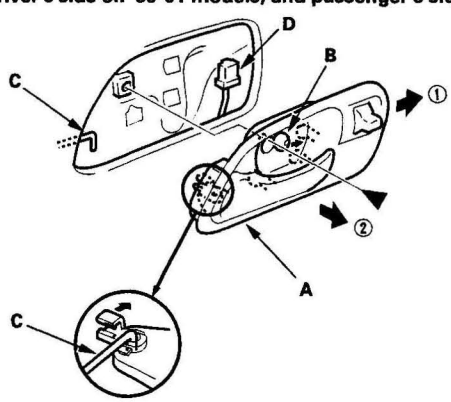
2. Remove the inner handle (A). Take care not to scratch the door panel.

   –1 Pry out the cap (B), and remove the screw.
   –2 Pull the inner handle forward and out half-way.
   –3 Disconnect the inner handle rod (C), power door lock switch connector (D), and on '02-03 models, driving position memory switch connector (E) (driver's).

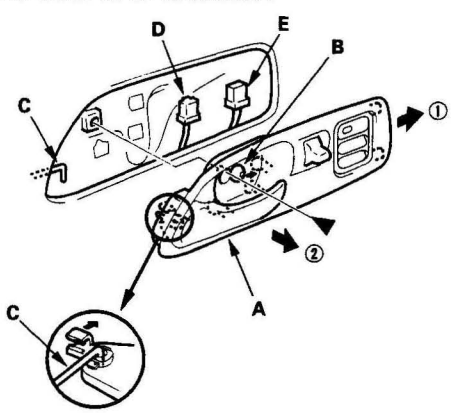
Fastener Location
▶ : Screw, 1



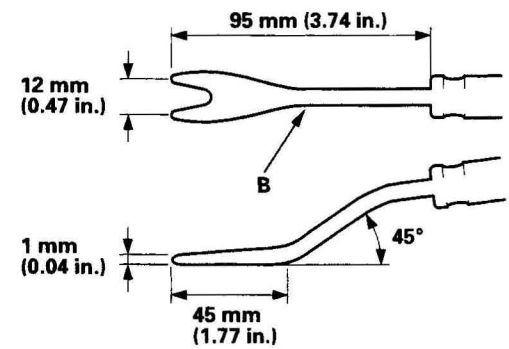
Without driving position memory switch (driver's side on '99-01 models, and passenger's side:)



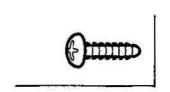
With driving position memory switch (driver's side on '02-03 models) :

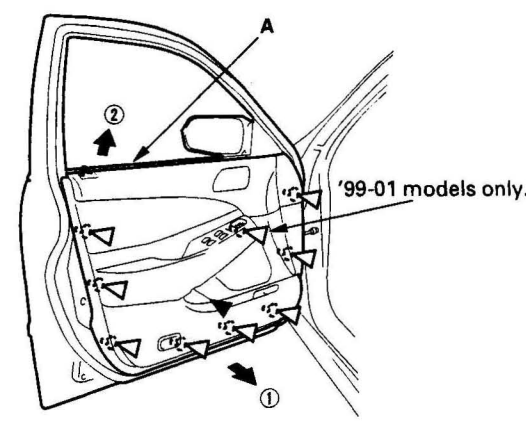


3. Remove the screw from the armrest portion of the door panel. Release the clips that hold the door panel (A) with a commercially available trim pad remover (B), then remove the door panel by pulling it upward. Remove the door panel with as little bending as possible to avoid creasing or breaking it.



Fastener Locations
▶ : Screw, 1 ▷ : Clip, 9
'99-01 models: 9
'02-03 models: 8

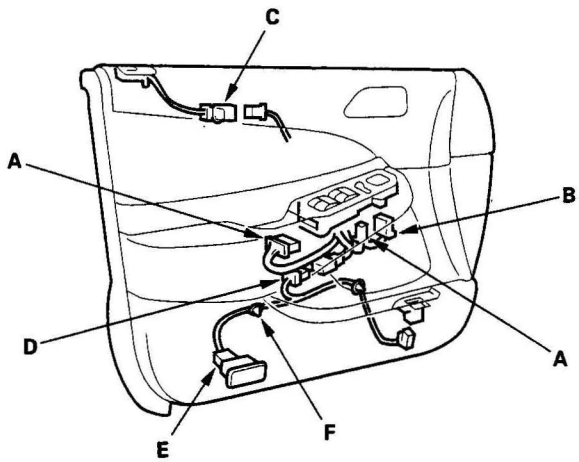




BACK

Protected by AR

4. Disconnect the power window switch connectors (A), power mirror switch connector (B) (driver's), security indicator connector (C) (driver's), driver's door subharness connector (D), and courtesy light bulb socket (passenger's) (E), and detach the harness clips (F) from the passenger's door panel.



5. Install the panel in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Make sure the connectors and courtesy light bulb socket are plugged in properly, and the rod is connected properly.
   - Check the window and power door lock operation.

Front Door Outer Handle Replacement

NOTE: Put on gloves to protect your hands.

1. Remove these items:

   - Door panel (see page 20-6)
   - Plastic cover, as necessary (see page 20-2)

2. Raise the glass fully.

3. Pull the glass run channel (A) away as necessary ('99 model), and remove the bolt, then remove the center lower channel (B) by pulling it downward. On '00-03 models, remove it with the lower glass run channel(C).

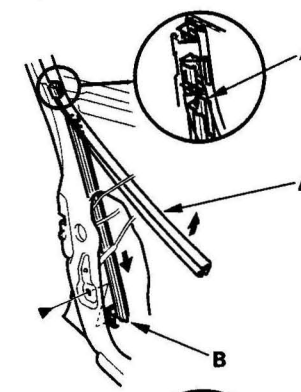
Fastener Location

▶: Bolt, 1

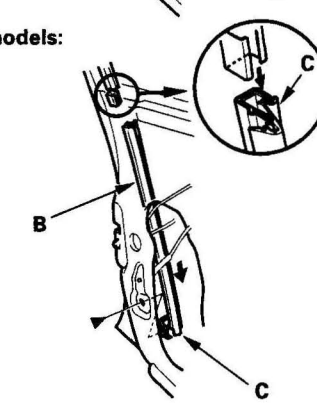


6 x 1.0 mm
8 N·m
(0.8 kgf·m,
6 lbf·ft)

'99 model:



'00-03 models:



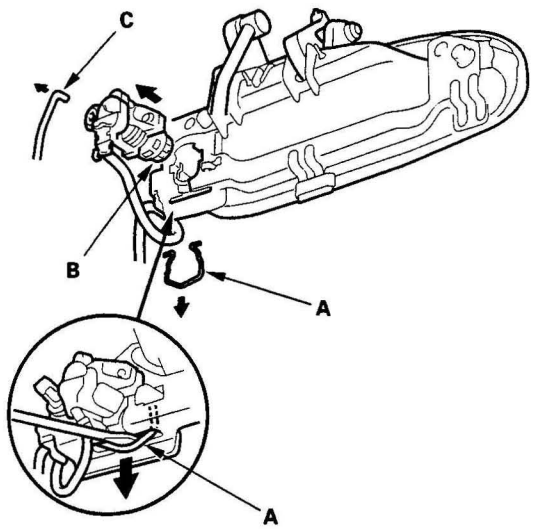
(cont'd)

BACK

Protected by AR

Front Door Outer Handle Replacement (cont'd)

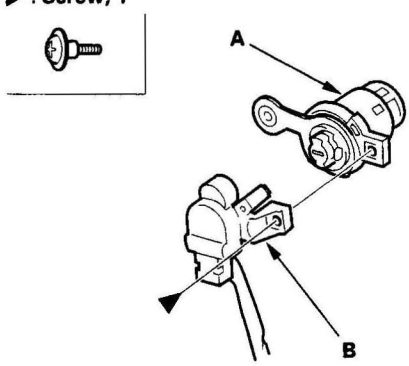
4. Use a small screwdriver to release the retainer clip (A), then remove the lock cylinder (B). Disconnect the cylinder rod (C).



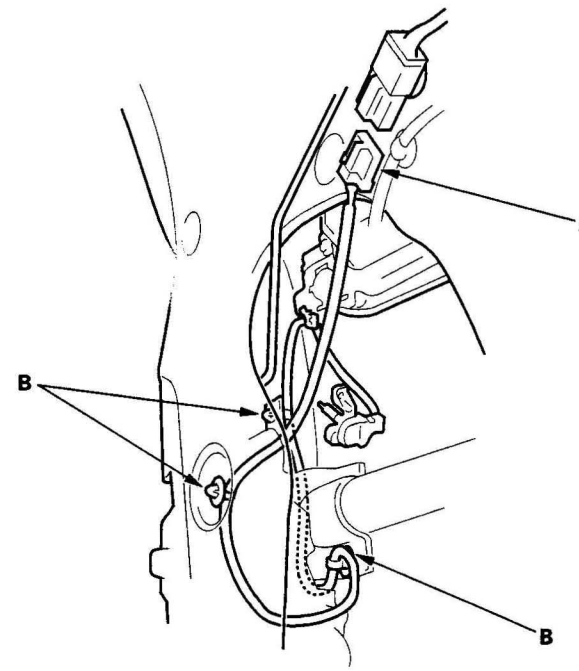
5. Remove the screw, then separate the lock cylinder (A) and cylinder switch (B).

Fastener Location

▶ : Screw, 1



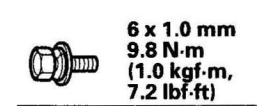
6. Disconnect the cylinder switch connector (A), and detach the harness clips (B).

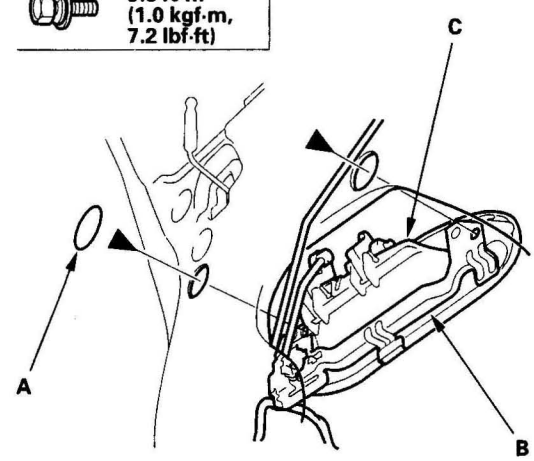


7. Remove the hole seal (A), and remove the bolts securing the outer handle protector (B) and outer handle (C).

Fastener Locations

▶ : Bolt, 2

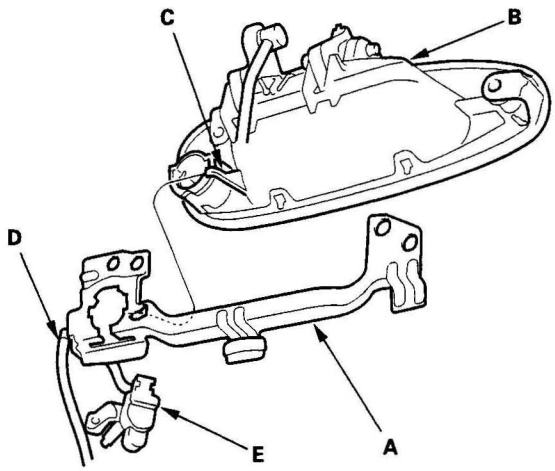




BACK

Protected by AR

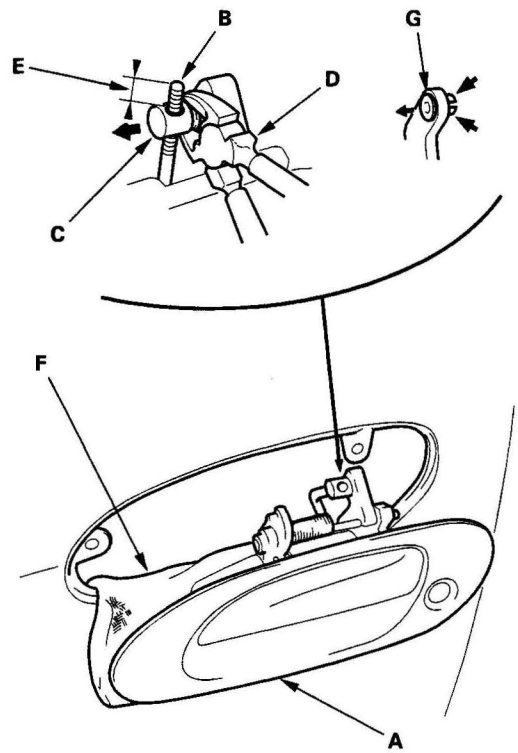
8. Remove the outer handle protector (A) from the outer handle (B) by releasing the hook (C).



9. Detach the harness clip (D) from the outer handle protector, then remove the outer handle protector and cylinder switch (E) from the door.

10. Pull out the outer handle (A). Pry the outer handle rod (B) out of its joint (C) using diagonal cutters (D).

NOTE:
- To ease reassembly, note the distance (E) of the outer handle rod on the joint before disconnecting it.
- Take care not to bend the outer handle rod.
- Use a shop towel (F) to protect the opening in the door.



11. Replace the bushing (G) on the outer handle.

(cont'd)

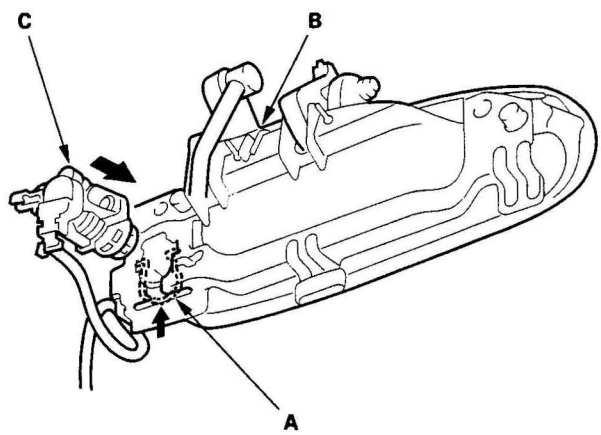
BACK

Protected by AR

Front Door Outer Handle Replacement (cont'd)

12. Install the handle in the reverse order of removal, and note these items:

    - Make sure the cylinder switch harness is routed properly.
    - Make sure the connector is plugged in properly, and each rod is connected securely.
    - Make sure the door locks and opens properly.
    - When installing the lock cylinder, leave the outer door handle bolts loose so the inner protector does not interfere with the lock cylinder.
    - Install the lock cylinder retaining clip (A) on the handle (B), then install the lock cylinder (C). Be sure the clip is fully seated in the slot on the lock cylinder.
    - When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.



Front Door Latch Replacement

NOTE: Put on gloves to protect your hands.

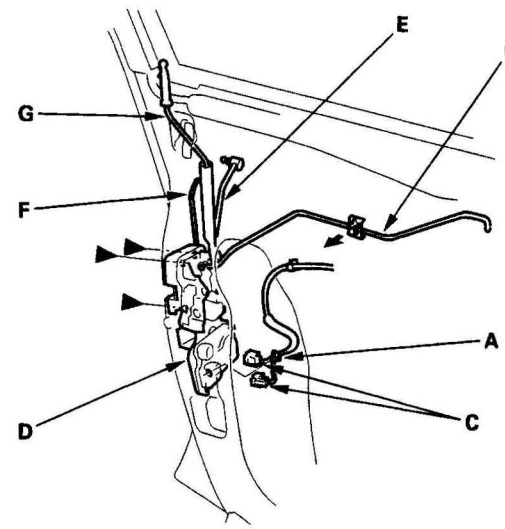
1. Raise the glass fully.
2. Remove the outer handle (see page 20-7).
3. Detach the harness clip (A) and inner handle rod (B), and disconnect the actuator connectors (C).

Fastener Locations

▶ : Screw, 3



6 x 1.0 mm
6 N·m
(0.6 kgf·m, 4 lbf·ft)



4. Remove the screws, then remove the latch (D) through the hole in the door. Take care not to bend the outer handle rod (E), cylinder rod (F), lock rod (G) and inner handle rod (B).
5. Install the latch in the reverse order of removal, and note these items:

    - Make sure the actuator connectors are plugged in properly, and each rod is connected securely.
    - Make sure the door locks and opens properly.
    - When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.

BACK

Protected by AR

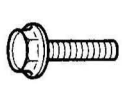
Front Door Glass and Regulator Replacement

1. Remove these items:
   - Door panel (see page 20-6)
   - Plastic cover (see page 20-2)

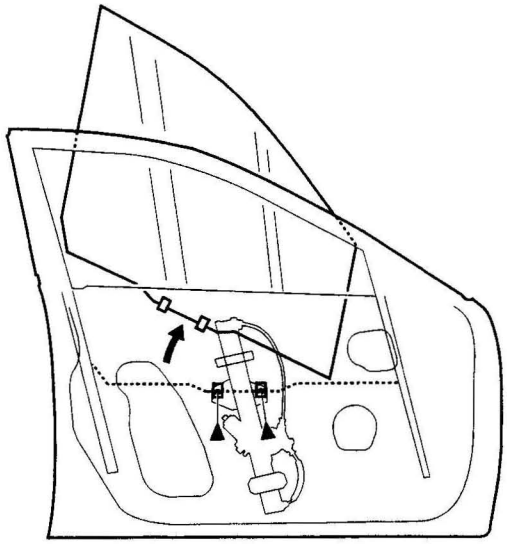
2. Carefully raise the glass until you can see the bolts, then remove them. Carefully pull the glass out through the window slot. Take care not to drop the glass inside the door.

Fastener Locations

▶ : Bolt, 2



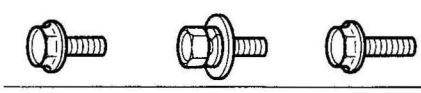
6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



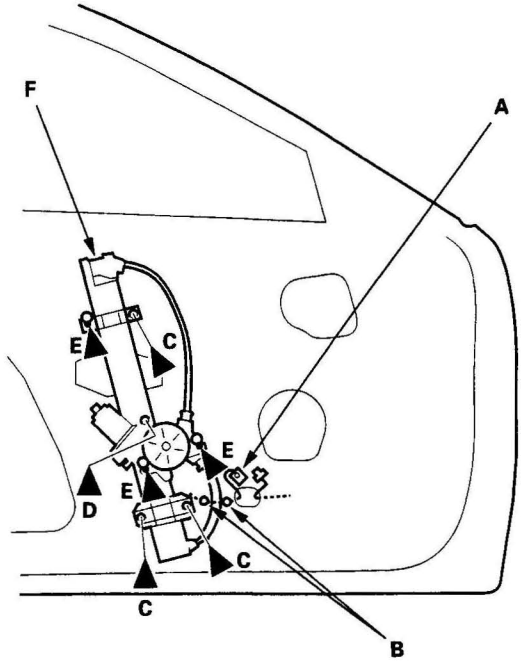
3. Disconnect and detach the connector (A) and harness clip(s) (B) from the door. Remove the bolts (C, D) and loosen the bolts (E), then remove the regulator (F) through the hole in the door.

Fastener Locations

C ▶ : Bolt, 3 D ▶ : Bolt, 1 E ▶ : Bolt, 3



6 x 1.0 mm
9.8 N·m
(0.8 kgf·m,
6 lbf·ft)



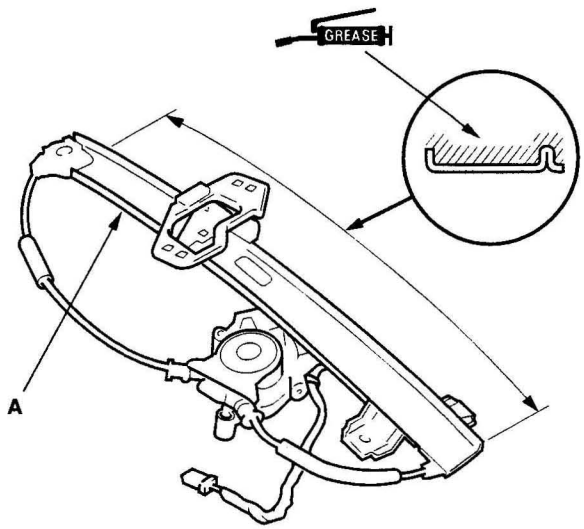
(cont'd)

BACK

Protected by AR

Front Door Glass and Regulator Replacement (cont'd)

4. Apply multipurpose grease to all the sliding surfaces of the regulator (A) where shown.



5. Install the glass and regulator in the reverse order of removal, and note these items:

   - Roll the glass up and down to see if it moves freely without binding.
   - Make sure that there is no clearance between the glass and glass run channel when the glass is closed.
   - Adjust the position of the glass as necessary (see page 20-20).
   - When reinstalling the door panel, make sure the plastic cover is installed properl and sealed around its perimeter.

Rear Door Panel Removal/ Installation

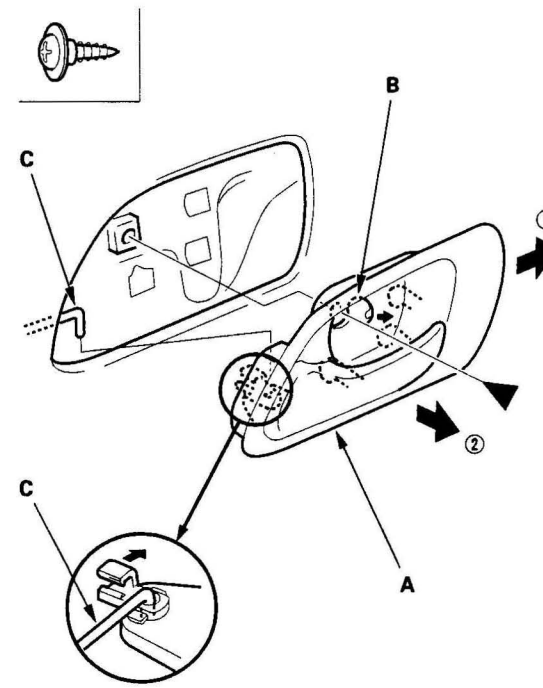
Special Tool Required
Trim pad remover, Snap-on A177A or equivalent, commercially available.

1. Remove the inner handle (A). Take care not to scratch the door panel.

   –1 Pry out the cap (B), and remove the screw.
   –2 Move the inner handle forward and half-way out, then disconnect the inner handle rod (C).

Fastener Location

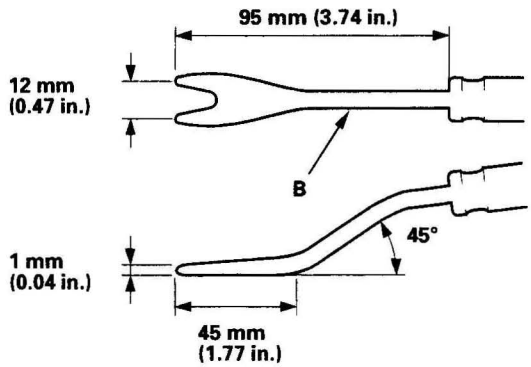
▶: Screw, 1



BACK

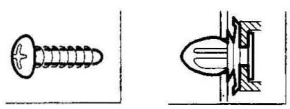
Protected by AR

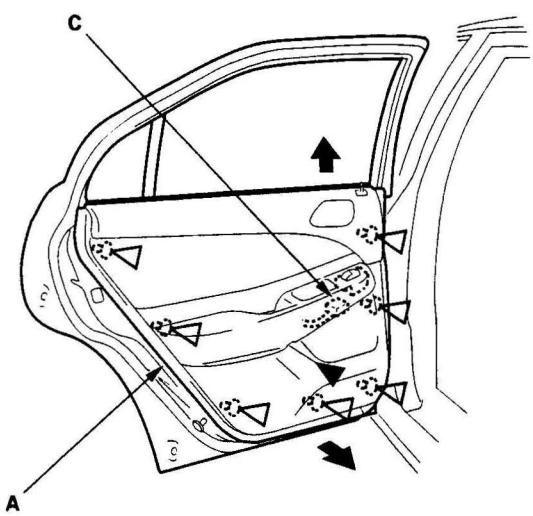
2. Remove the screw from the armrest portion of the door panel. Release the clips that hold the door panel (A) with a commercially available trim pad remover (B), then remove the door panel by pulling it upward, and disconnecting the power window switch connector (C). Remove the door panel with as little bending as possible to avoid creasing or breaking it.



Fastener Locations

▶: Screw, 1 ▷: Clip, 7





3. Install the panel in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure the connector is plugged in properly, and the rod is connected properly.
- Check the window and power door lock operation.

Protected by AR

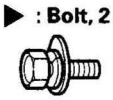
Rear Door Outer Handle Replacement

NOTE: Put on gloves to protect your hands.

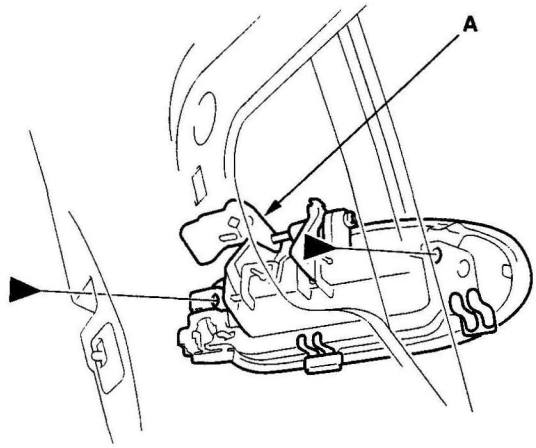
1. Remove these items:
   - Door panel (see page 20-12)
   - Plastic cover, as necessary (see page 20-4)
2. Raise the glass fully.
3. Remove the rod protector (see step 3 on page 20-15).
4. Disconnect the lock rod from the lock crank (see step 4 on page 20-15).
5. Remove the screws securing the latch, and detach the lock rod and inner handle rod from the rod holder, then move the latch down (see step 5 on page 20-15).
6. Remove the bolts securing the outer handle (A).

Fastener Locations

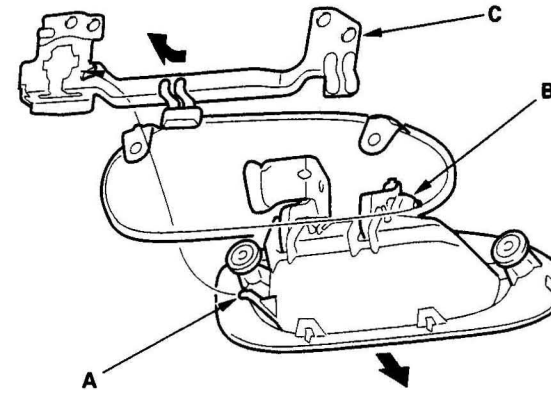
▶ : **Bolt, 2**



6 x 1.0 mm
9.8 N·m
(1.0 kgf·m, 7.2 lbf·ft)



7. Release the hook (A) while holding the outer handle (B), then remove the outer handle and outer handle protector (C) from the door.



8. Install the handle in the reverse order of removal, and note these items:
   - Make sure the door locks and opens properly.
   - When reinstalling the door panel, make sure the plastic cover is installed properly and seaded around its perimeter.

BACK

Protected by AR

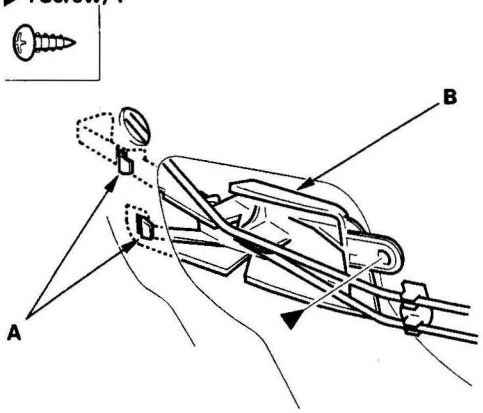
Rear Door Latch Replacement

NOTE: Put on gloves to protect your hands.

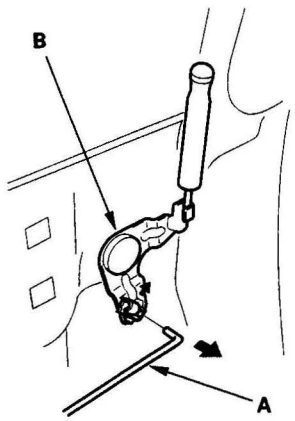
1. Remove these items:
   - Door panel (see page 20-12)
   - Plastic cover, as necessary (see page 20-4)
2. Raise the glass fully.
3. Remove the screw, and release the hooks (A), then remove the rod protector (B).

Fastener Location

▶: Screw, 1



4. Disconnect the lock rod (A) from the lock crank (B).



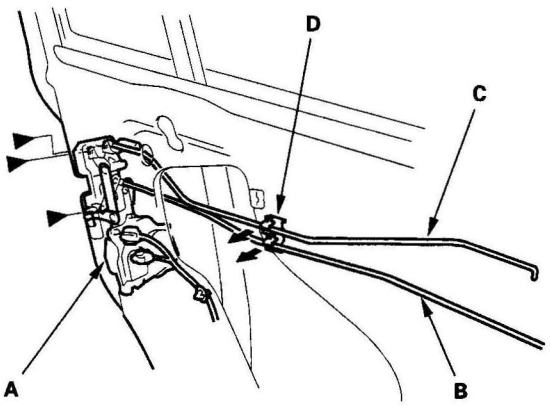
5. Remove the screws securing the latch (A), and detach the lock rod (B) and inner handle rod (C) from the rod holder (D). Take care not to bend any of the rods.

Fastener Locations

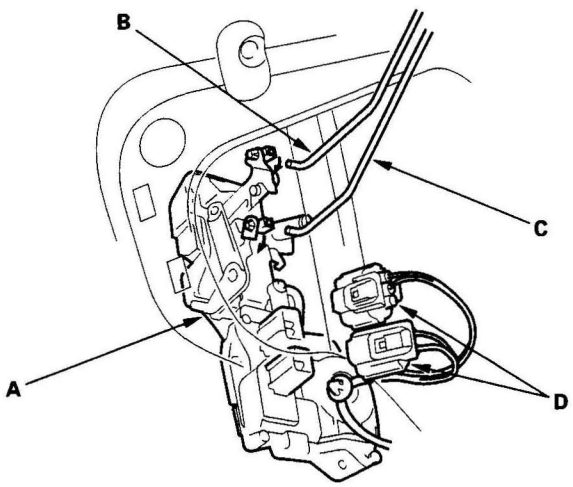
▶: Screw, 3



6 x 1.0 mm
6 N·m
(0.6 kgf·m,
4 lbf·ft)



6. Move the latch (A) until you can disconnect each rod, and disconnect the inner handle rod (B), lock rod (C) and connectors (D) from the latch. Take care not to bend any of the rods.

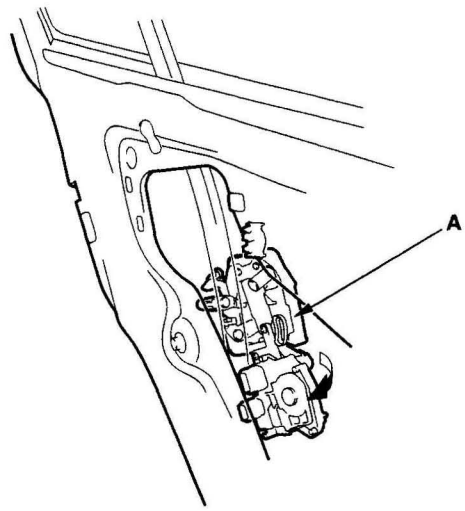


(cont'd)

Protected by AR

Rear Door Latch Replacement (cont'd)

7. Remove the latch (A) through the hole in the door.



8. Install the latch in the reverse order of removal, and note these items:

   - Make sure the connectors are plugged in properly, and each rod is connected securely.
   - Make sure the door locks and opens properly.
   - When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.

Rear Door Glass, Quarter Glass, and Regulator Replacement

NOTE: Put on gloves to protect your hands.

1. Remove these items:

   - Door panel (see page 20-12)
   - Plastic cover (see page 20-4)
   - Rod protector (see step 3 on page 20-15)

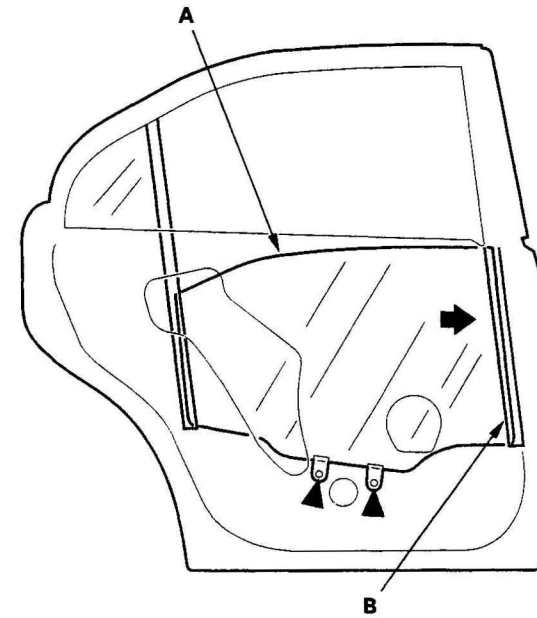
2. Carefully move the glass (A) until you can see the bolts, then loosen them. Push the glass against the center channel (B).

Fastener Locations

▶ **Bolt, 2**



6 x 1.0 mm
9.8 N·m
(1.0 kgf·m, 7.2 lbf·ft)



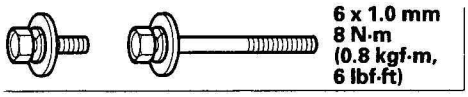
BACK

Protected by AR

3. Remove the bolts (A, B) and collar (C) from the rear channel (D). Pull the upper seal (E) away as needed, and remove the screw (F). Pull the glass run channel (G) away as needed from the rear channel.

Fastener Locations

A ▶ : Bolt, 1 **B ▶ : Bolt, 1**

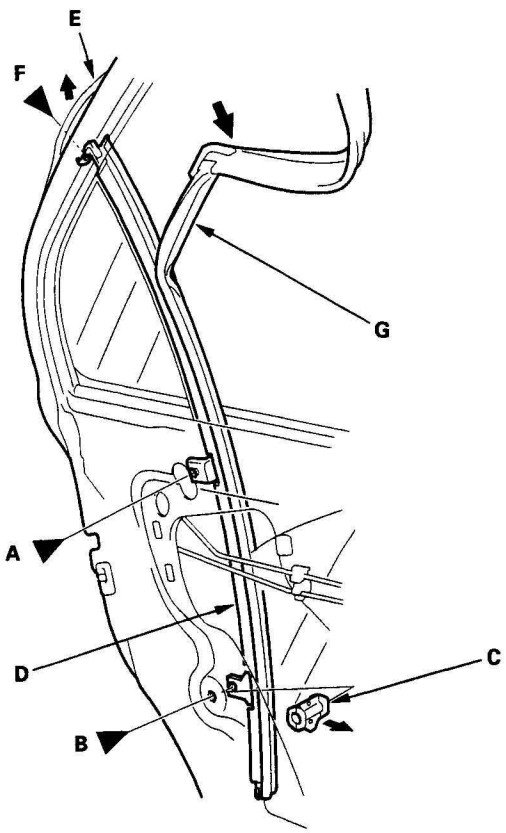


6 x 1.0 mm
8 N·m
(0.8 kgf·m,
6 lbf·ft)

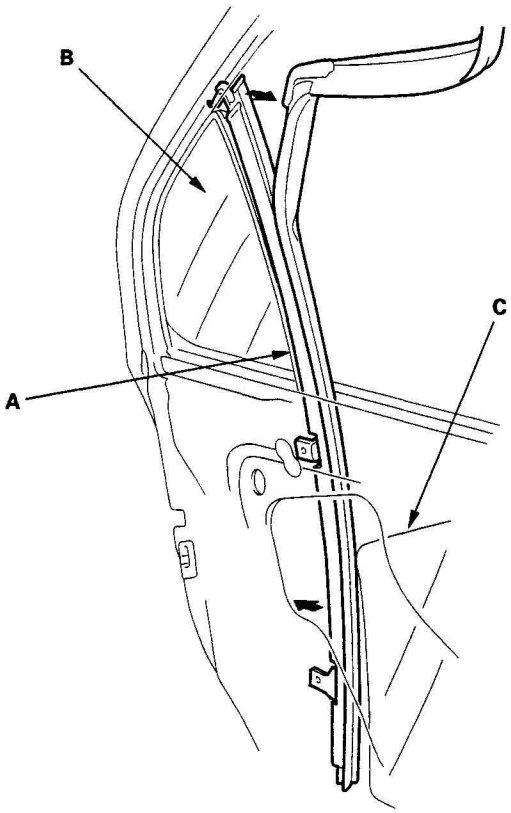
F ▶ : Screw, 1



4 x 0.8 mm
4 N·m
(0.4 kgf·m,
3 lbf·ft)



4. Move the rear channel (A) away from the quarter glass (B) and the rear door glass (C). Take care not to damage the door molding (D).



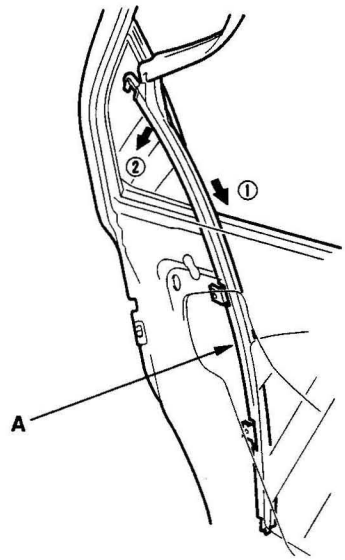
(cont'd)

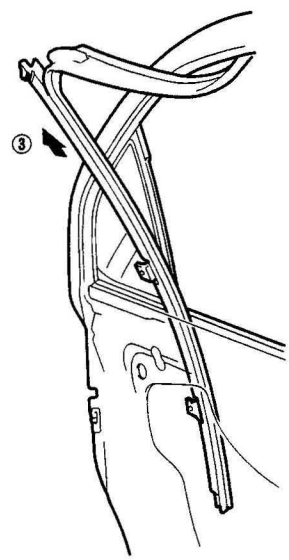
BACK

Protected by AR

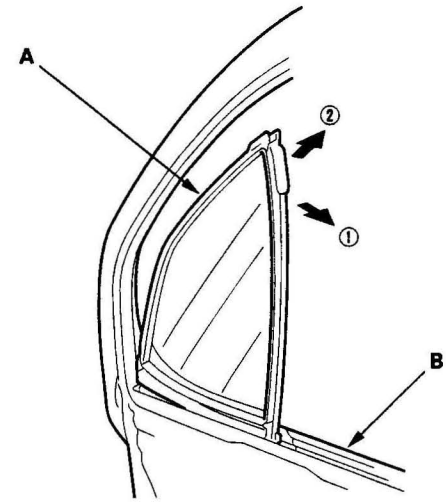
Rear Door Glass, Quarter Glass, and Regulator Replacement (cont'd)

5. Remove the rear channel (A) out through the window slot. Take care not to damage the door molding.





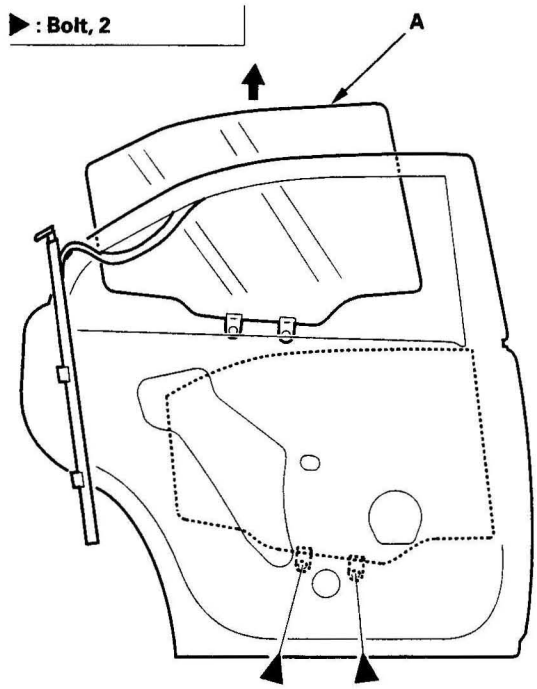
6. Remove the quarter glass (A). Take care not to damage the door molding (B).



7. Remove the bolts, then carefully remove the glass (A) out through the window slot. Take care not to drop the glass inside the door.

Fastener Locations

▶ : Bolt, 2



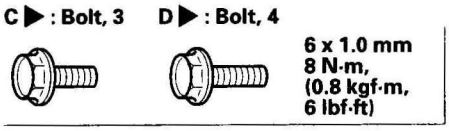
BACK

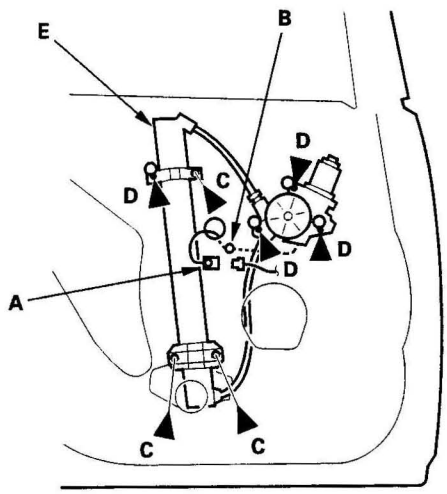
Protected by AR

8. Disconnect and detach the connector (A) and harness clip (B) from the door. Remove the bolts (C), and loosen the bolts (D), then remove the regulator (E) through the hole in the door.

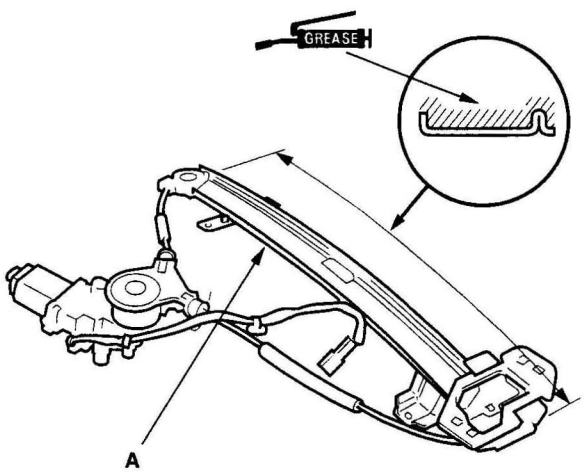
Fastener Locations

C ▶ : Bolt, 3 D ▶ : Bolt, 4





9. Apply multipurpose grease to all the sliding surfaces of the regulator (A) where shown.



10. Install the glass and regulator in the reverse order of removal, and note these items:

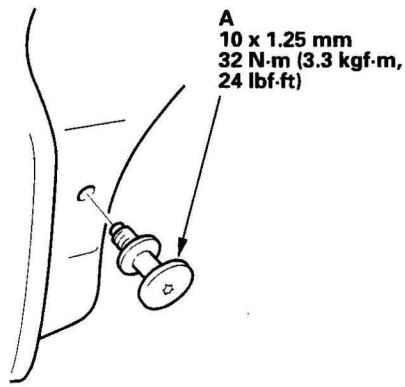
- Roll the glass up and down to see if it moves freely without binding.
- Make sure that there is no clearance between the glass and glass run channel when the glass is closed.
- Adjust the position of the glass as necessary (see page 20-20)
- When reinstalling the door panel, malce sure the plastic cover is installed properly and sealed around its perimeter.

BACK

Protected by AR

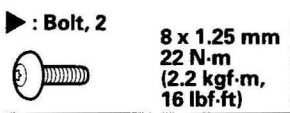
Rear Door Hook Pin and Catch Replacement

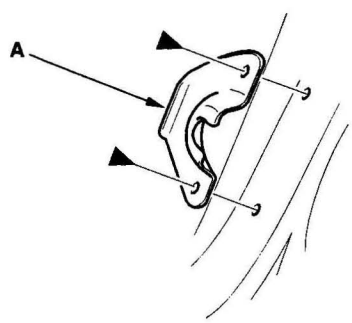
1. With a Torx T40 bit, remove the door hook pin (A) from the door.



2. With a Torx T40 bit, remove the bolts, then remove the door catch (A) from the body.

Fastener Locations





3. Install the hook pin and catch in the reverse order of removal, and apply liquid thread lock to the threads of the door hook pin.

Front and Rear Door Glass Adjustment

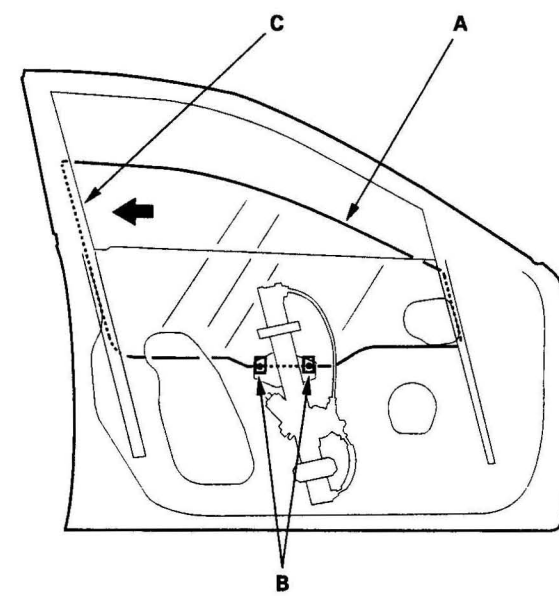
NOTE:
- Check the weatherstrips and glass run channel for damage or deterioration, and replace them if necessary.
- Wipe the run channel clean with a shop towl.
- Lubricate the run channel with Shin-Etsu grease P/N08798-9013.

1. Place the vehicle on a firm, level surface.

2. Remove these items:
   - Door panel, front door (see page 20-6), rear door (see page 20-12)
   - Plastic cover, front door (see page 20-2), rear door (see page 20-4)

3. Carefully move the glass (A) until you can see the glass mounting bolts (B), then loosen them.

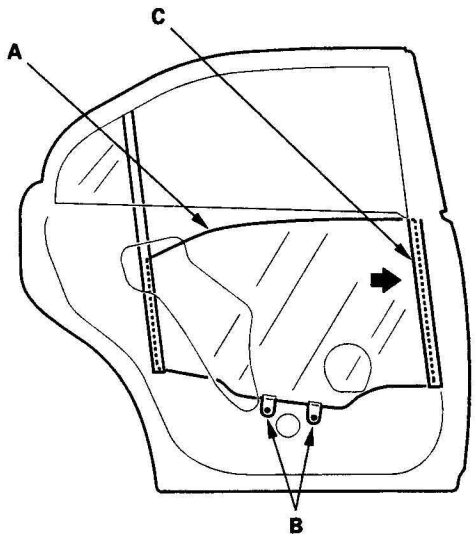
Front:



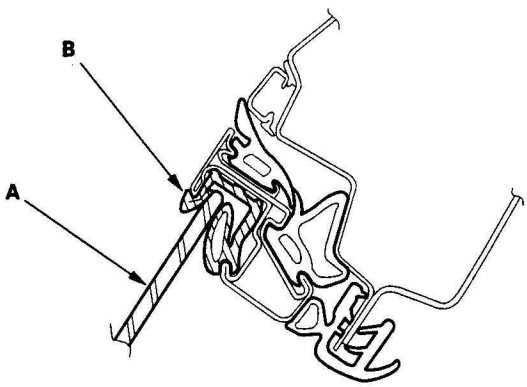
BACK

Protected by AR

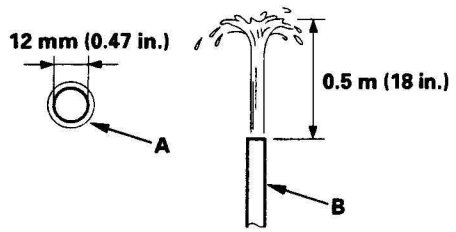
Rear:

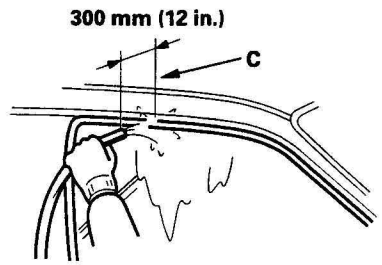


4. Push the glass (A) against the center channel (C), then tighten the glass mounting bolts.
5. Check that the glass moves smoothly.
6. Raise the glass fully, and check for gaps. Check that the glass (A) contacts the glass run channel (B) evenly.



7. Check for water leaks. Run water over the roof and on the sealing area as shown, and note these items:
   - Use a 12mm (1/2 in.) diameter hose (A).
   - Adjust the rate of water flow as shown (B).
   - Do not use a nozzle.
   - Hold the hose about 300 mm (12 in.) away from the door (C).





8. Attach the plastic cover, and install the door panel, front door (see page 20-6), rear door (see page 20-12).

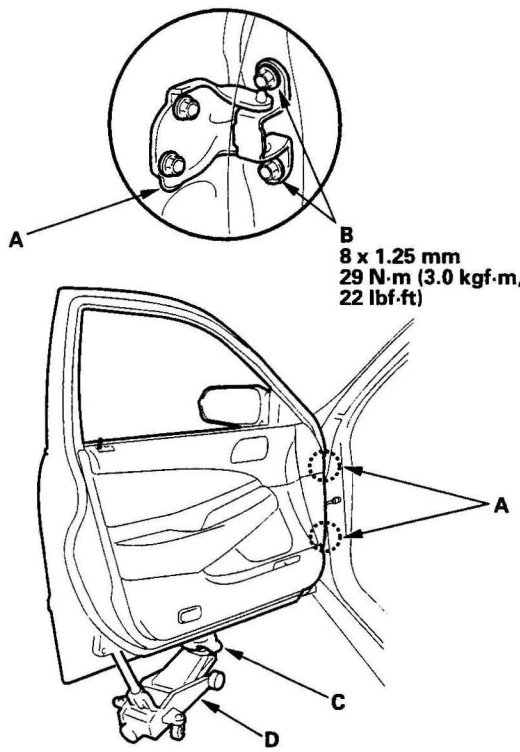
BACK

Protected by AR

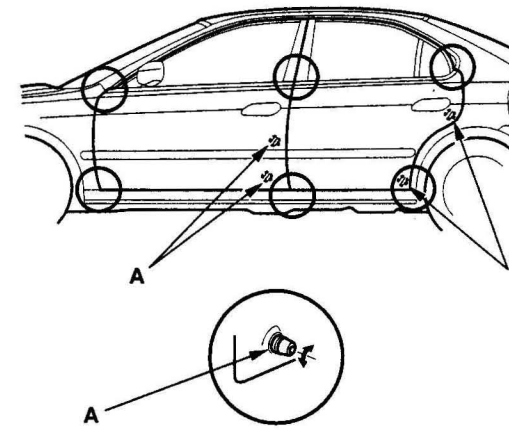
Front and Rear Door Position Adjustment

NOTE: After installing the door, check for a flush fit with the body, then check for equal gaps between the front, rear, and bottom door edges and the body. Check that the door and body edges are parallel.

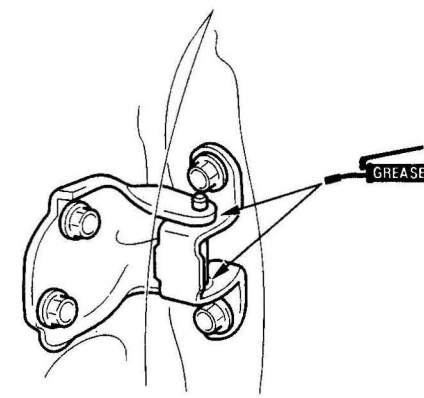
1. Place the vehicle on a firm, level surface when adjusting the doors.
2. Adjust at the hinges (A):
   - Loosen the door mounting bolts (B) slightly, and move the door in or out until it's flush with the body.
   - With a shop towel (C) on the jack (D), move the door up or down as necessary to equalize the gaps.



3. Check that the door and body edges are parallel. If necessary, adjust the door cushions (A) to make the rear of the doors flush with the body.



4. Grease the pivot portions of the hinges indicated by the arrows.



5. Apply touch-up paint to the hinge mounting bolts, and around the hinges.
6. Check for water leaks (see step 7 on page 20-21).

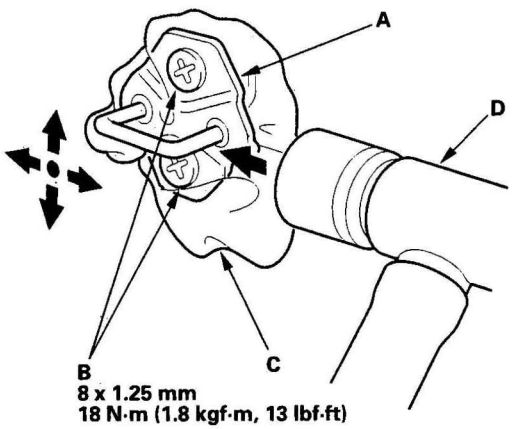
BACK

Protected by AR

Front and Rear Door Striker Adjustment

Make sure the door latches securely without slamming it. If necessary, adjust the striker (A): The striker nuts are fixed, but the striker can be adjusted slightly up or down, and in or out.

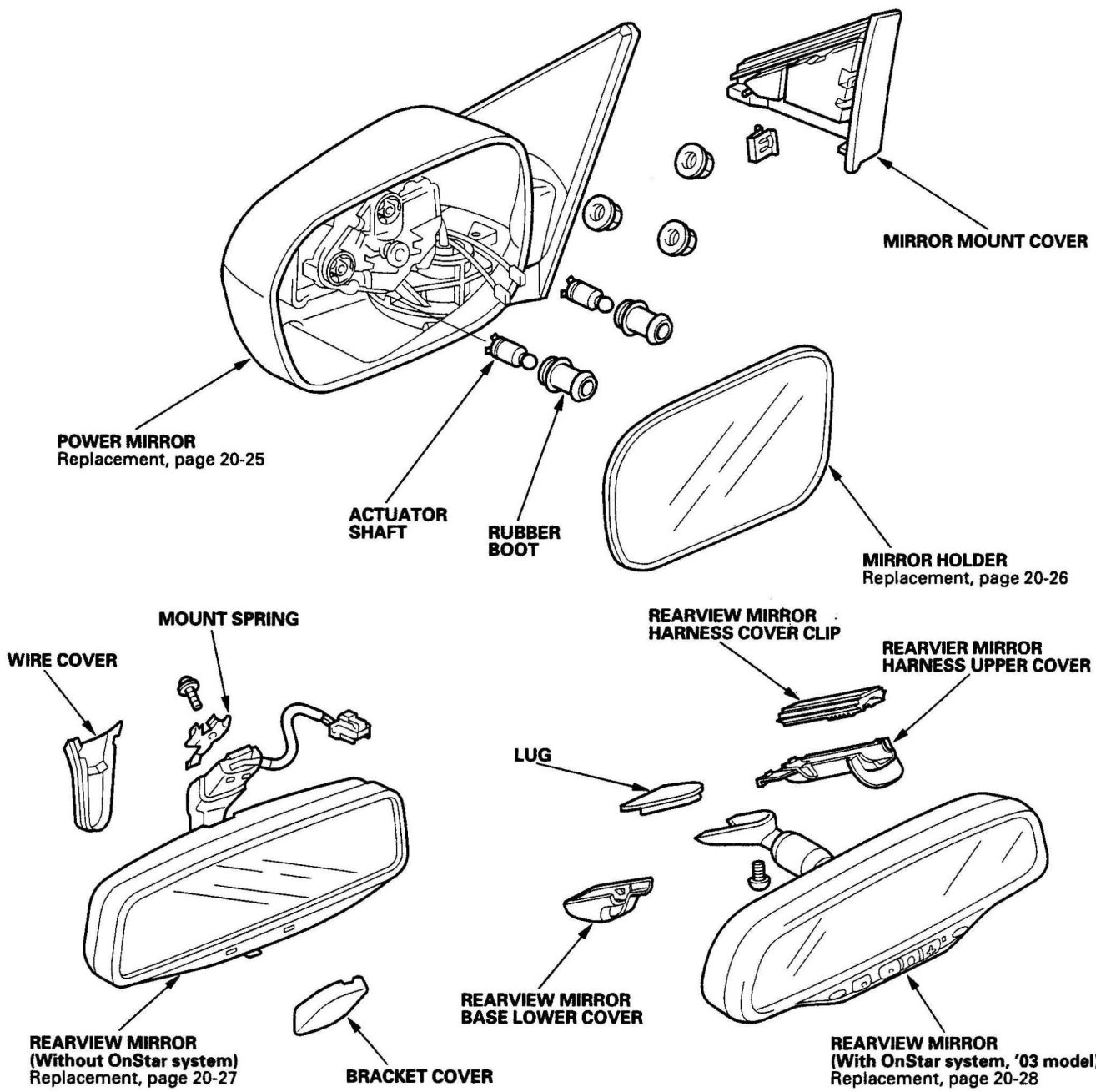
1. Loosen the screws (B), then insert a shop towel (C) between the body and striker.



2. Lightly tighten the screws.
3. Wrap the striker with a shop towel, then adjust the striker by tapping it with a plastic hammer (D). Do not tap the striker too hard.
4. Loosen the screws, and remove the shop towel.
5. Lightly tighten the screws.
6. Hold the outer handle out, and push the door against the body to be sure the striker allows a flush fit. If the door latches properly, tighten the screws and recheck.

Protected by AR

Component Location Index



BACK

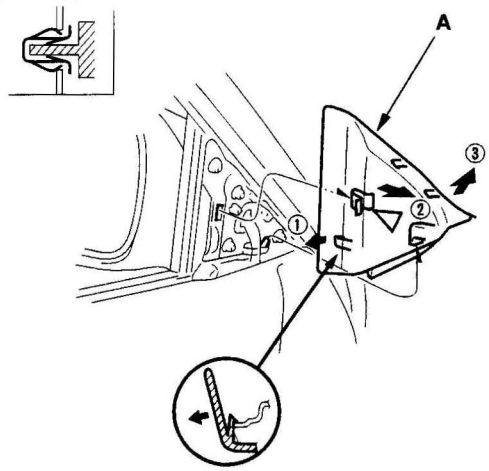
Protected by AR

Power Mirror Replacement

1. Lower the door glass fully.
2. Carefully pry out the mirror mount cover (A) by hand in the sequence shown.

Fastener Locations

▷ : Clip, 2

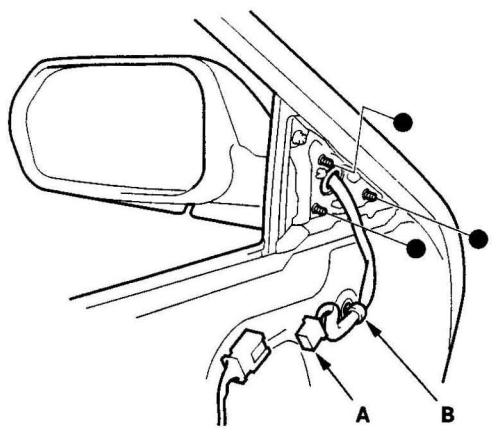


3. Remove the door panel (see page 20-6).
4. Disconnect the connector (A), and detach the harness clip (B), then remove the nuts securing the mirror.

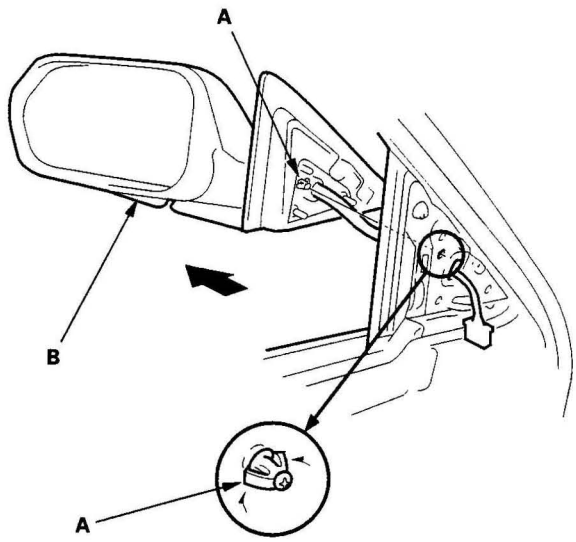
Fastener Locations

● : Nut, 3

	5 x 0.8 mm 5 N·m (0.5 kgf·m, 4 lbf·ft)



5. While holding the mirror, push out the clip (A), and remove the mirror (B). Take care not to scratch the door.



6. Install the mirror in the reverse order of removal, and note these items:

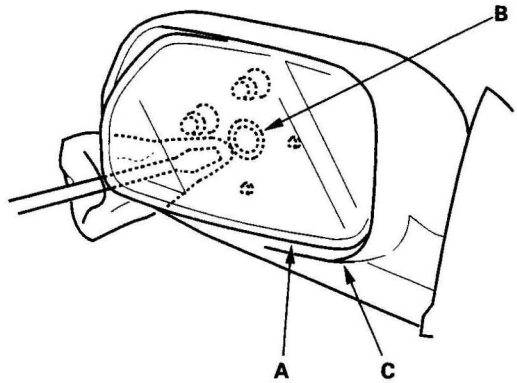
- Make sure the connector is plugged in properly.
- Attach the harness clip.

BACK

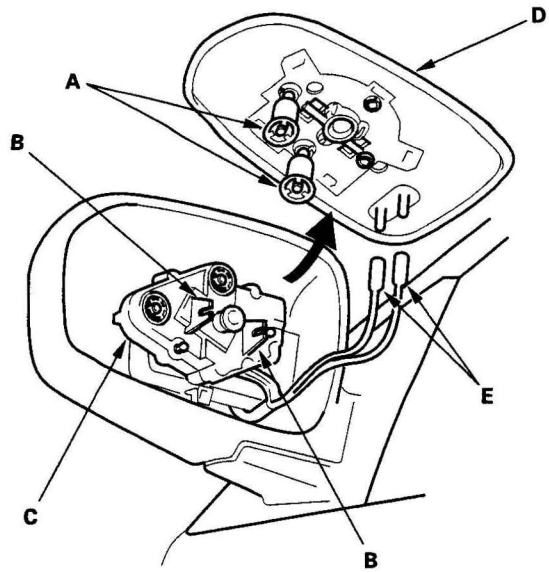
Protected by AR

Mirror Holder Replacement

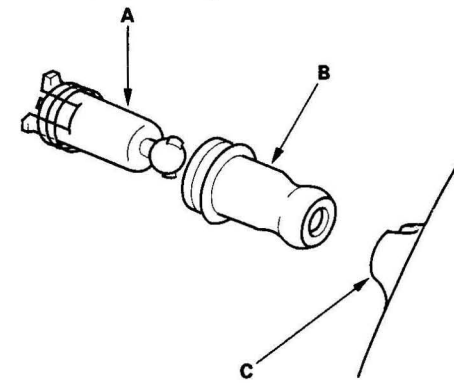
1. Pry the mirror holder (A) out from the bottom until you can see the pivot (B) of the actuator, then detach the pivot using a flat-tip screwdriver wrapped with a shop towel. Take care not to scratch the mirror (C).



2. Pull out the actuator shafts (A), release the hooks (B) from the actuator (C), and remove the mirror holder (D). Disconnect the mirror defogger terminals (E).

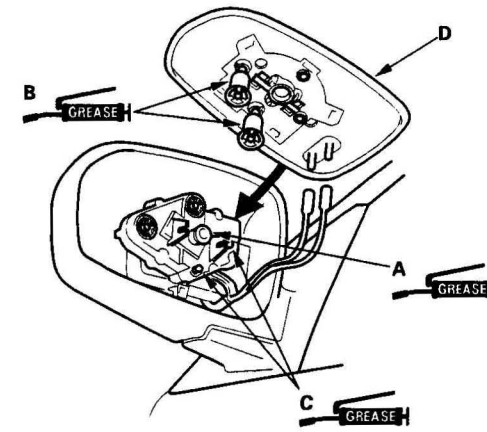


3. Remove the actuator shafts (A) and rubber boots (B) from the old mirror holder (C). Check the actuator shaft and rubber boot for damage or deterioration, and replace them if necessary.



4. Install the holder in the reverse order of removal, and note these items:

- Before installing the mirror holder, install the actuator shafts and boots on the mirror holder.
- Make sure the mirror defogger terminals are plugged in properly.
- Grease the pivot (A), actuator shafts (B), and if equipped, mirror position sensor pins (C).
- Reattach the mirror holder (D) to the pivot (A) and actuator shafts (B) to the actuator, then carefully push on the pivot and actuator shaft portions of the holder until it locks into place.
- To ease installation of the mirror holder, it may be necessary to heat the pivot and actuator shaft joint portions of the mirror holder.
- Make sure the actuator shaft boots are installed into the actuator. If necessary, use a small screwdriver to reinstall them. Take care not to scratch the mirror.
- Check the operation of the actuator.



BACK

Protected by AR

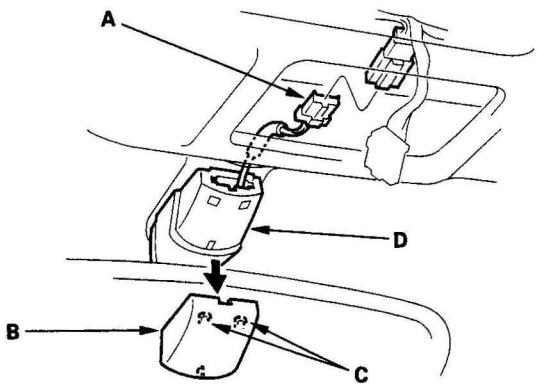
Rearview Mirror Replacement

Without OnStar System

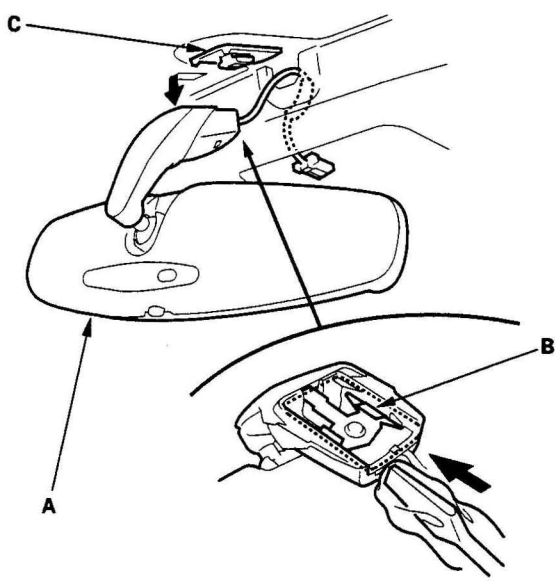
NOTE: When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.

1. Remove the roof console (see page 20-59).

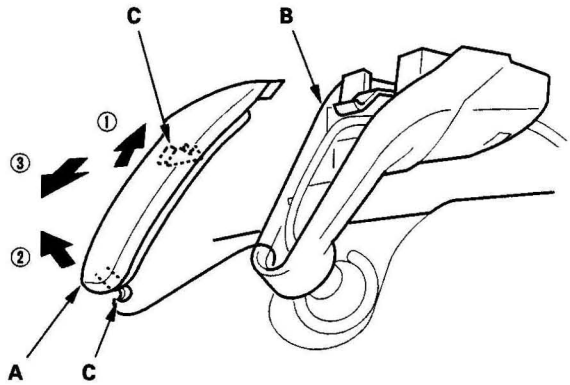
2. Disconnect the connector (A), and carefully remove the bracket cover (B) by releasing the hooks (C). Take care not to scratch the cover and mirror bracket (D).



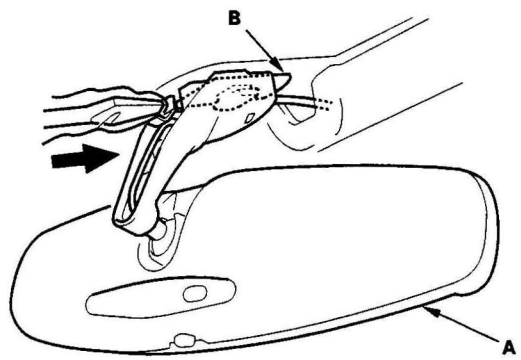
3. Slide the rearview mirror (A) forward to release the spring (B), by gently tapping the mirror bracket with a flat-tip screwdriver and a plastic hammer. Remove the mirror from the lug (C).



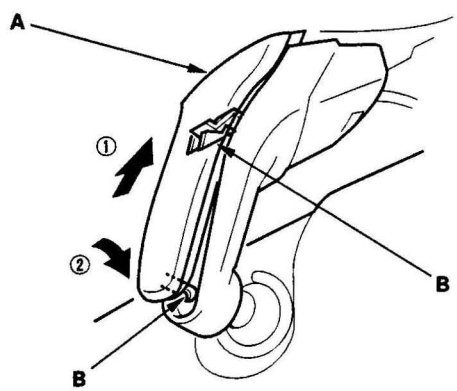
4. Remove the wire cover (A) from the mirror bracket (B) by releasing the hooks (C) in the sequence shown.



5. Install the rearview mirror (A) by sliding it over the lug (B) until the spring contacts the lug. Gently tap the mirror bracket with a flat-tip screwdriver and a plastic hammer. Be careful not to damage the wires.



6. Install the wire cover (A) in the sequence shown. Take care not to damage the hooks (B).



7. Install the bracket cover, and connect the connector, then install the roof console.

BACK

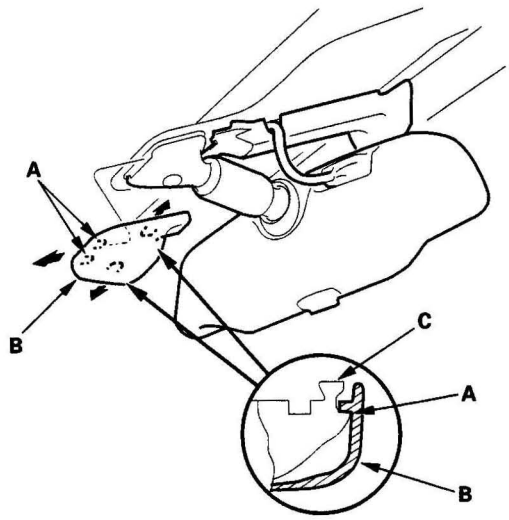
Protected by AR

Rearview Mirror Replacement (cont'd)

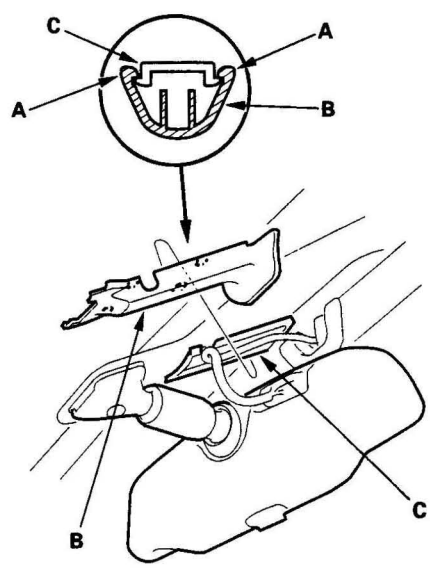
With Onstar system

NOTE: When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.

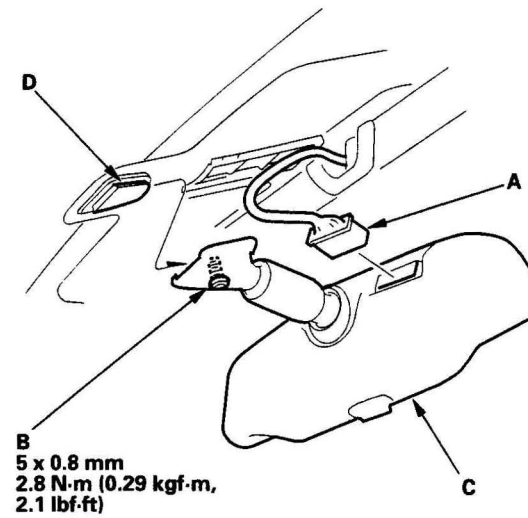
1. Carefully pry the hooks (A) with a flat-tip screwdriver, then remove the reaview mirror base lower cover (B) from the rearview mirror base (C).



2. Carefully pry the hooks (A) with a flat-tip screwdriver, then remove the rearview mirror harness upper cover (B) from the rearview mirror harness clip (C).



3. Disconnecgt the connector (A), and loosen the screw (B) with a Torx T20 bit, then slide the rearview mirror (C) rearward and off the lug (D).



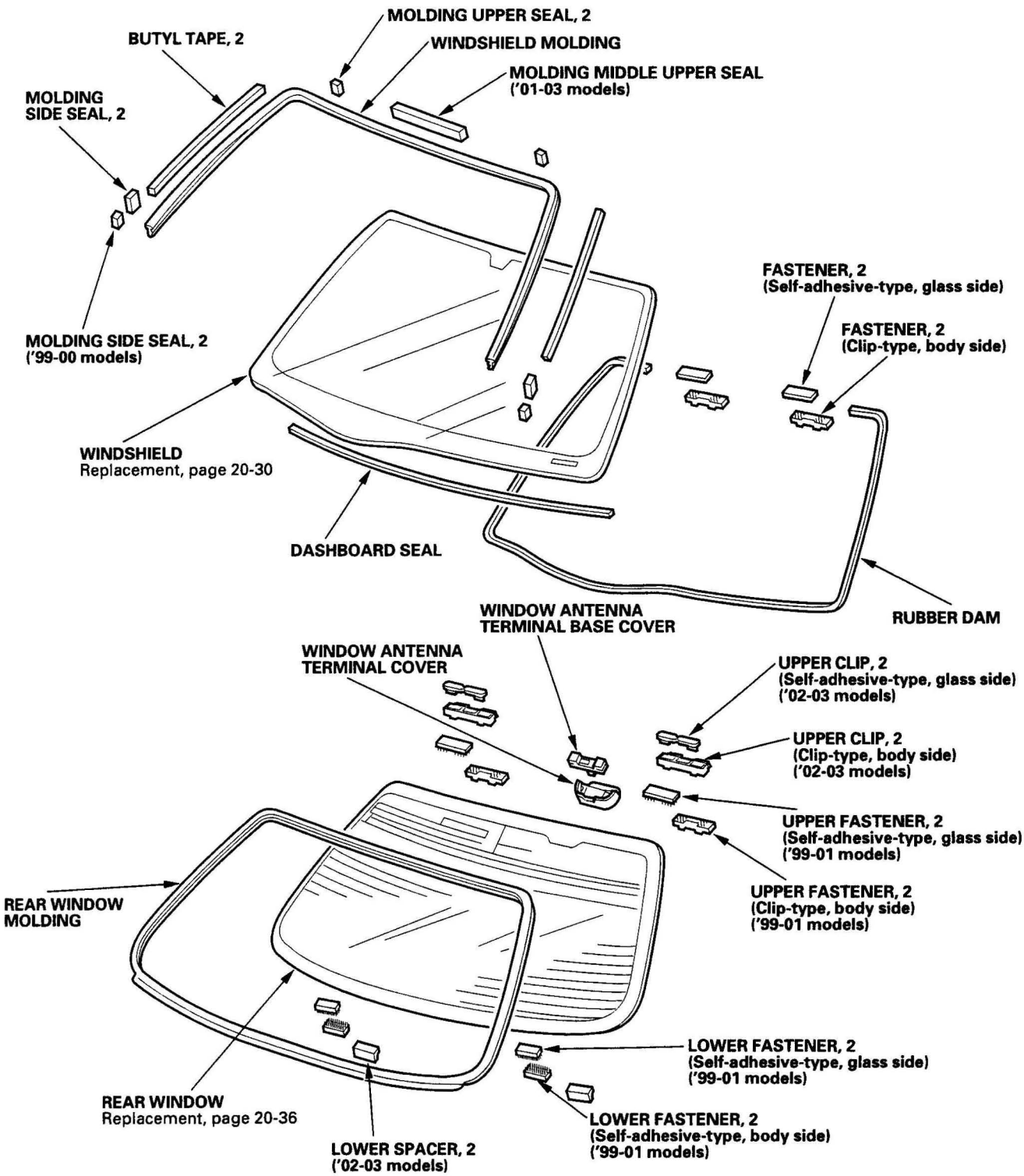
4. Install the mirror in the reverse order of removal, and note these items:

   - Before installing the mirror, remove the Torx screw, and apply lipuid thread lock to it.
   - Make sure the connector is plugged in properly.

BACK

Protected by AR

Component Location Index



BACK

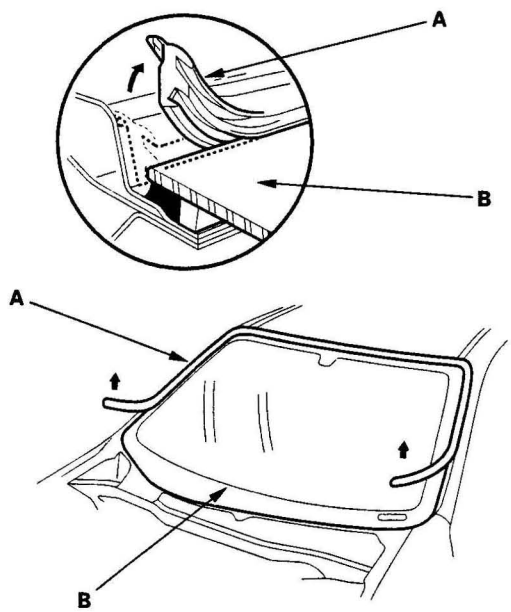
Protected by AR

Windshield Replacement

NOTE:
- Put on gloves to protect your hands.
- Use seat covers to avoid damaging any surfaces.
- Wear eye protection when removing the glass with piano wire.

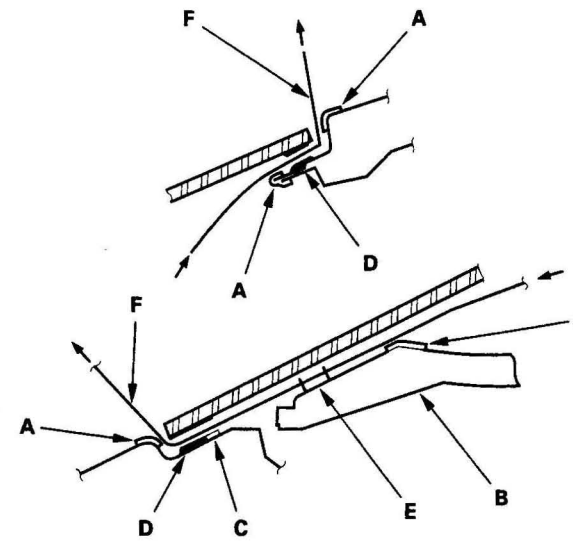
1. Remove the windshield wiper arms and cowl cover (see page 22-286).

2. Remove the molding (A) from the edge of the windshield (B). If necessary, cut the molding with a utility knife.

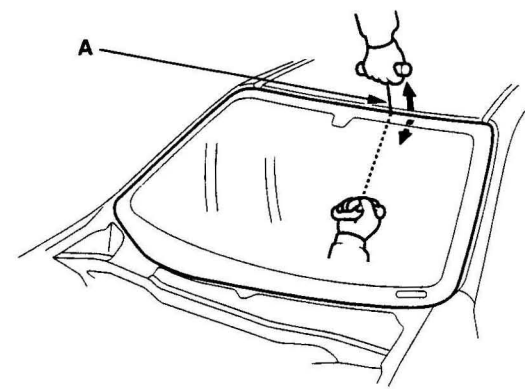


3. Pull down the front portion of the headliner (see page 20-59). Take care not to bend the headliner excessively, as you may crease or break it.

4. Apply protective tape (A) along the edge of the dashboard (B) and body as shown. Using an awl, make a hole through the rubber dam (C), adhesive (D), and dashboard seal (E) from inside the vehicle. Push a piece of piano wire (F) through the hole, and wrap each end around a piece of wood.



5. With a helper on the outside, pull the piano wire (A) back and forth in a sawing motion. Hold the piano wire as close to the windshield as possible to prevent damage to the body and dashboard. Carefully cut through the rubber dam and adhesive around the entire windshield.



6. Carefully remove the windshield.

BACK

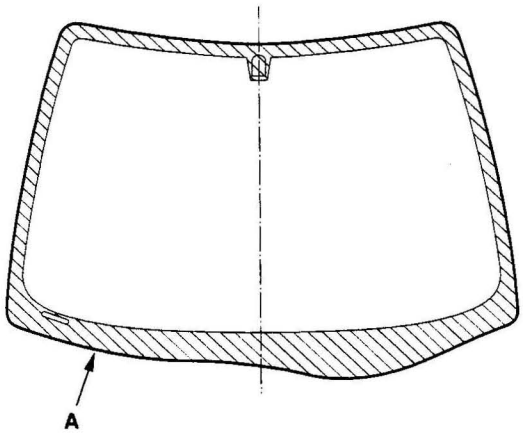
Protected by AR

7. With a knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire windshield opening flange:

   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the rubber dam and fasteners from the body.
   - Mask off surrounding surfaces before painting.

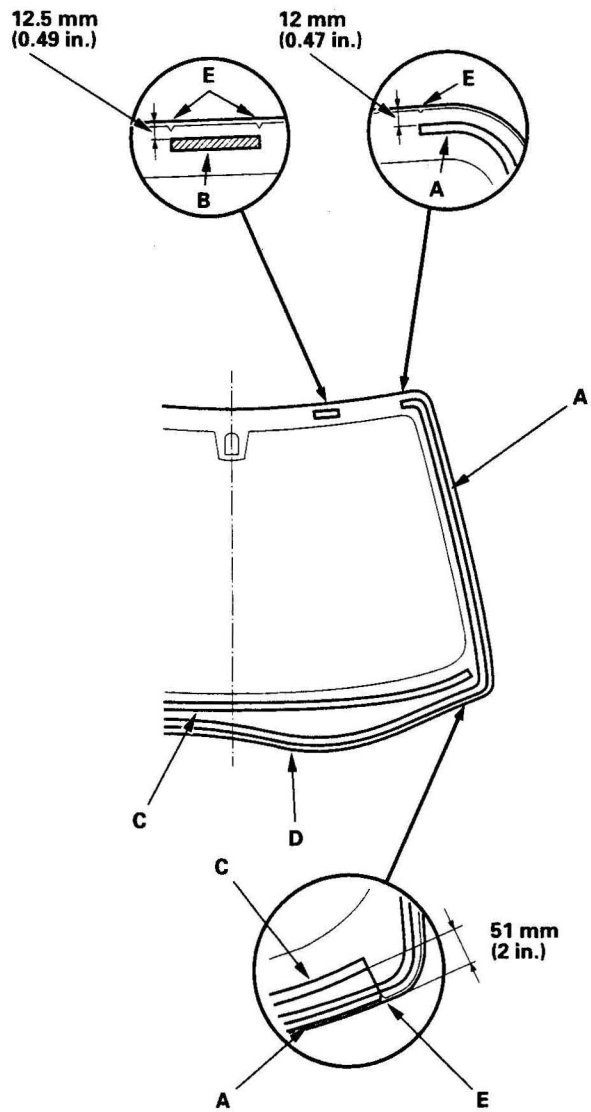
8. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the clean surface.

9. If the old windshield is to be reinstalled, use a putty knife to scrape off all of the old adhesive, the fasteners, the rubber dam and the dashboard seal from the windshield. Clean the shaded portion of the windshield (A) with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.



10. Glue the rubber dam (A), fasteners (B) with adhesive tape (3M 4215, or equivalent) and dashboard seal (C) to the inside face of the windshield (D) as shown:

    - Be sure the rubber dam, fasteners and dashboard seal line up with the alignment marks (E).
    - Be careful not to touch the windshield where adhesive will be applied.



(cont'd)

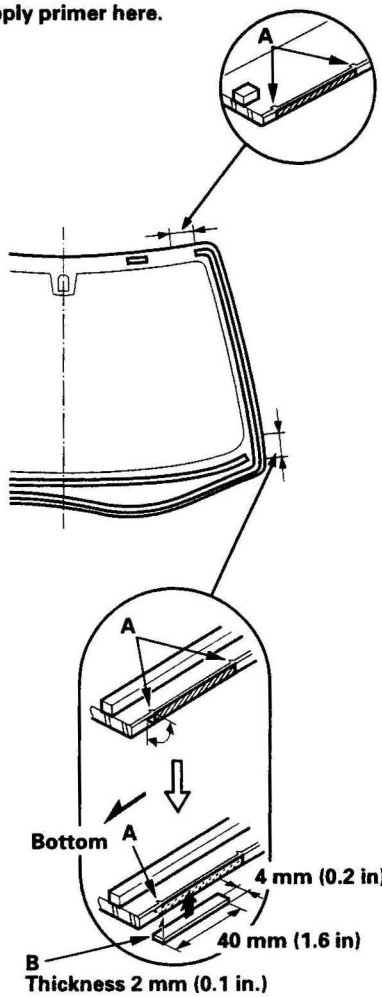
BACK

Protected by AR

Windshield Replacement (cont'd)

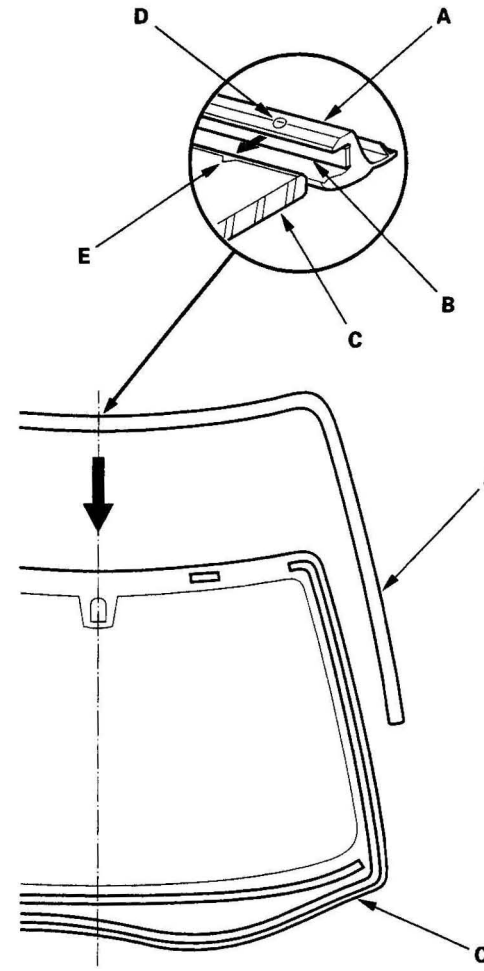
11. Apply primer (3M N-200, or equivalent) to the areas between the alignment marks (A), then apply the adhesive tape (B) (NITTO 501, or equivalent) to the edge of the windshield. Be careful not to touch the windshield where adhesive will be applied.

: Apply primer here.



12. Glue the molding (A) with adhesive tape (3M 4212, or equivalent) (B) to the edge of the windshield (C):

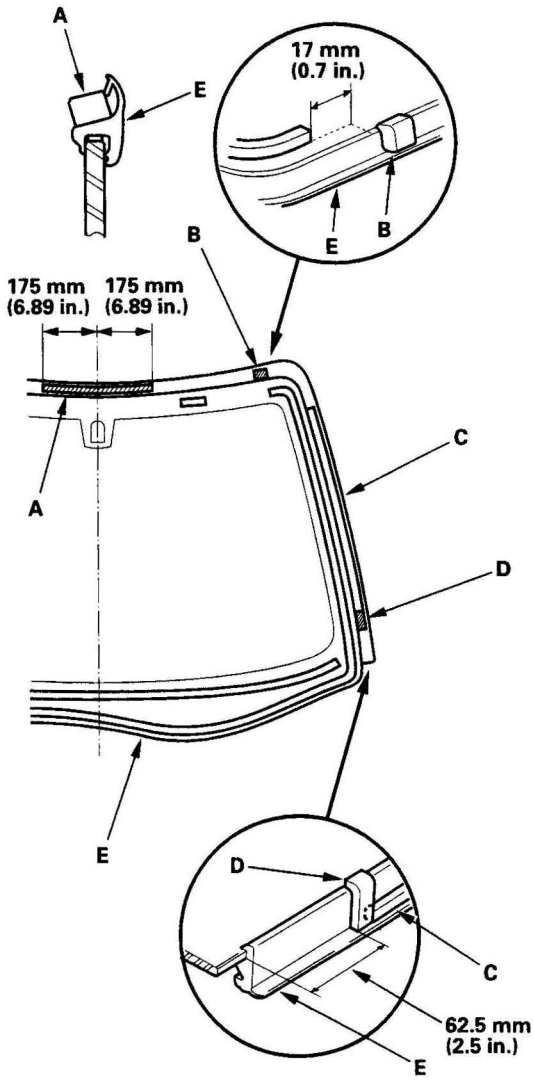
- Be sure the alignment mark (D) of the molding lines up with the alignment mark (E) of the windshield.
- Be careful not to touch the windshield where adhesive will be applied.



BACK

Protected by AR

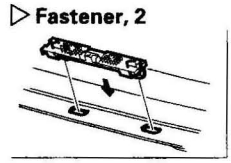
13. Glue the molding middle upper seal (A), molding upper seals (B), butyl tapes (DIABOND H13, or equivalent) (C) and molding side seals (D) to the molding (E). Be careful not to touch the windshield where adhesive will be applied.

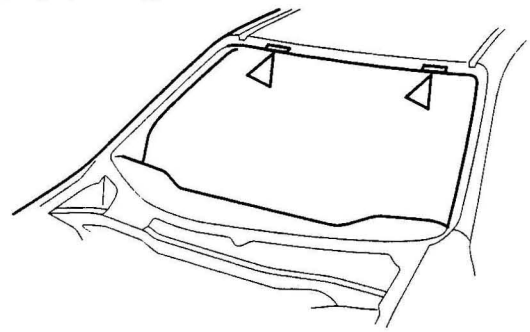


14. Set the windshield in the opening, and center it.

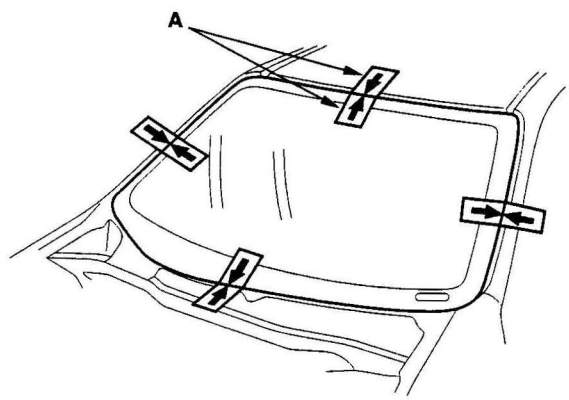
Fastener Location

▷ **Fastener, 2**





15. Make alignment marks (A) across the windshield and body with a grease pencil at the four points shown. Be careful not to touch the windshield where adhesive will be applied.



16. Remove the windshield.

(cont'd)

BACK

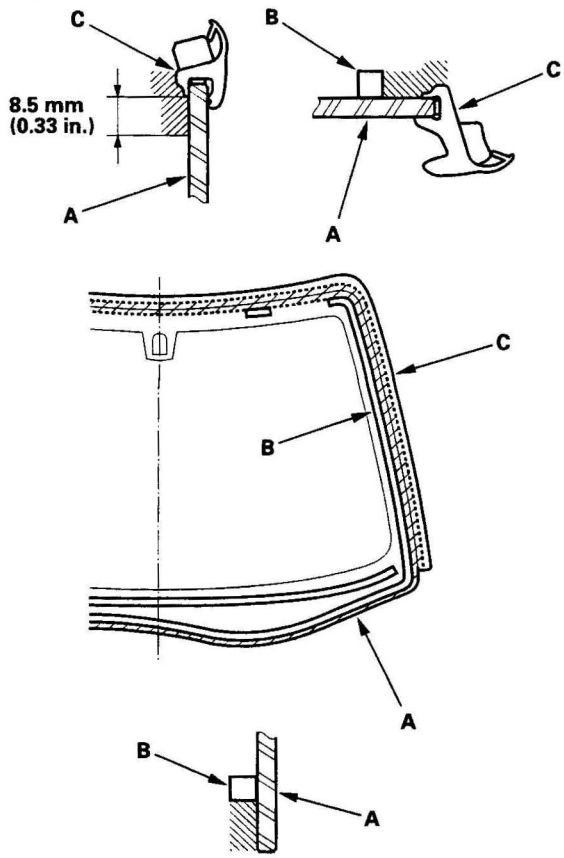
Protected by AR

Windshield Replacement (cont'd)

17. With a sponge, apply a light coat of glass primer around the edge of the windshield (A) between the dam (B) and molding (C) as shown, then lightly wipe it off with gauze or cheesecloth:

    - Apply glass primer to the molding.
    - Do not apply body primer to the windshield, and do not get body and glass primer sponges mixed up.
    - Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the windshield properly, causing a leak after the windshield is installed.
    - Keep water, dust, and abrasive materials away from the primed surface.

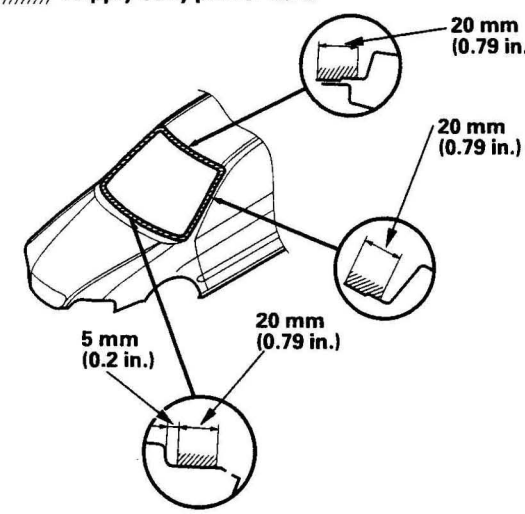
: Apply glass primer here.



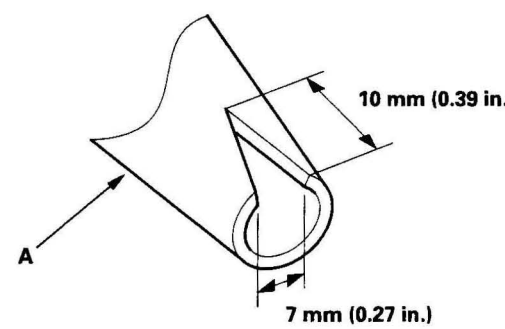
18. With a sponge, apply a light coat of body primer to the original adhesive remaining around the windshield opening flange. Let the body primer dry for at least 10 minutes:

    - Do not apply glass primer to the body, and do not get glass and body primer sponges mixed up.
    - Never touch the primed surfaces with your hands.
    - Mask off the dashboard before painting the flange.

: Apply body primer here.



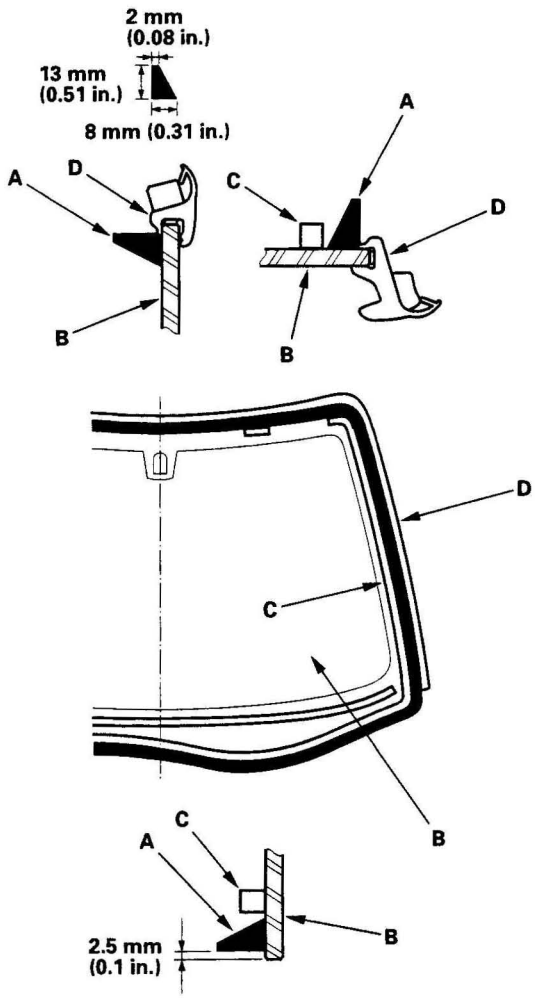
19. Before filling a cartridge, cut a "V" in the end of the nozzle (A) as shown.



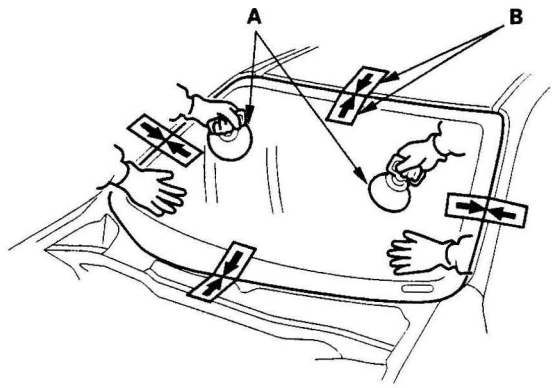
BACK

Protected by AR

20. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive (A) around the edge of the windshield (B) between the dam (C) and molding (D) as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



21. Use suction cups (A) to hold the windshield over the opening. Align it with the alignment marks (B) made in step 15, and set it down on the adhesive. Lightly push on the windshield until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.



22. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the windshield, wipe with a soft shop towel dampened with alcohol.

23. Let the adhesive dry for at least 1 hour, then spray water over the windshield and check for leaks. Mark leaking areas, and let the windshield dry, then seal with sealant:

    - Let the vehicle stand for at least 4 hours after windshield installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.
    - Keep the windshield dry for the first hour after installation.

24. Reinstall all remaining removed parts. Install the rearview mirror after the adhesive has dried thoroughly.

    NOTE: Advise the customer not to do the following things for 2 to 3 days:

    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

BACK

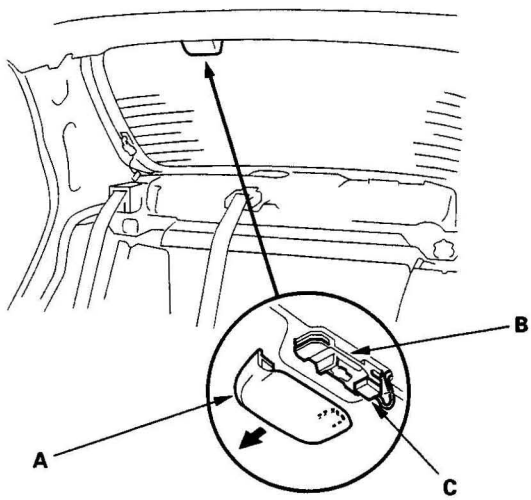
Protected by AR

Rear Window Replacement

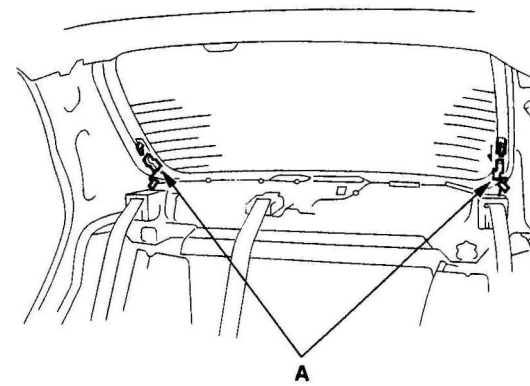
NOTE:
- Put on gloves to protect your hands.
- Use seat covers to avoid damaging any surfaces.
- Wear eye protection when removing the glass with piano wire.
- Do not damage the rear window defogger grid lines, window antenna grid lines, and terminals.

1. Remove these items:
   - Trunk lid (see page 20-114)
   - Rear seat-back and cushion (see page 20-95)
   - Rear shelf, both sides, '99-01 models (see page 20-56), '02-03 models (see page 20-57)

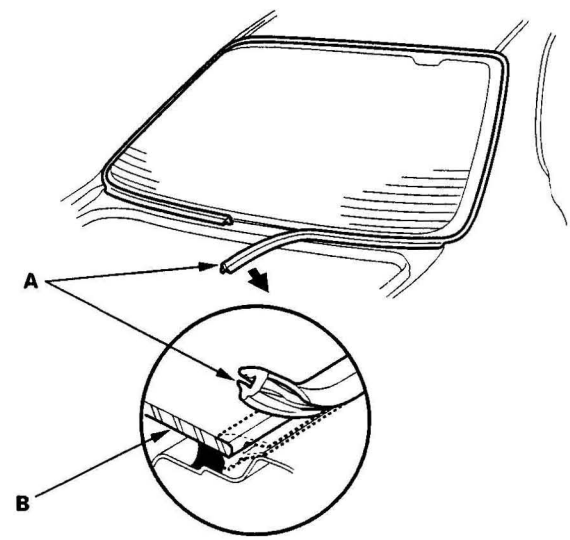
2. Remove the window antenna terminal cover (A) from the window antenna terminal base (B), and disconnect the window antenna connector (C).



3. Disconnect the rear window defogger connectors (A).



4. Remove the molding (A) from the edge of the rear window (B). If necessary, cut the molding with a utility knife.

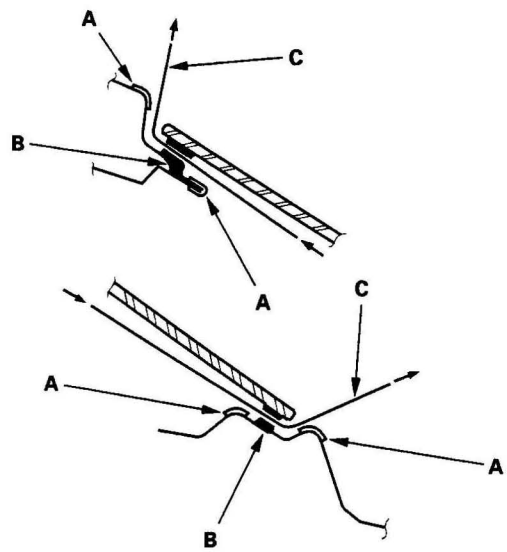


5. Pull down the rear portion of the headliner (see page 20-59). Take care not to bend the headliner excessively, as you may crease or break it.

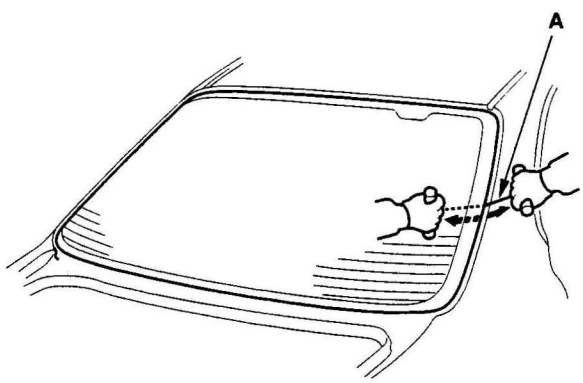
BACK

Protected by AR

6. Apply protective tape (A) along the inside and outside edges of the body as shown. Using an awl, make a hole through the adhesive (B) from inside the vehicle. Push a piece of piano wire (C) through the hole, and wrap each end around a piece of wood.



7. With a helper on the outside, pull the piano wire (A) back and forth in a sawing motion. Hold the piano wire as close to the rear window as possible to prevent damage to the body, and carefully cut through the adhesive around the entire rear window.



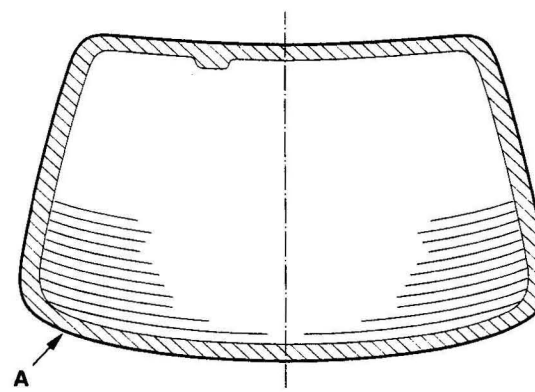
8. Carefully remove the rear window.

9. With a putty knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire rear window opening flange:

   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Mask off surrounding surfaces before painting.
   - Remove the fasteners from the body.

10. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the surface.

11. If the old rear window is to be reinstalled, use a putty knife to scrape off all of the old adhesive and the fasteners from the rear window. Clean the shaded portion of the rear window (A) with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.



(cont'd)

BACK

Protected by AR

Rear Window Replacement (cont'd)

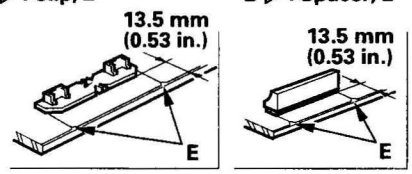
12. Glue the clips (A) with adhesive tape (3M 4216, or equivalent) and spacers (B) with adhesive tape (3M 5357, or equivalent) to the inside face of the rear window as shown. If necessary, apply primer (3M N-200, or equivalent) to the areas where the window antenna terminal base (C) will be glued, then glue the base on with adhesive tape (3M 4211, or equivalent):

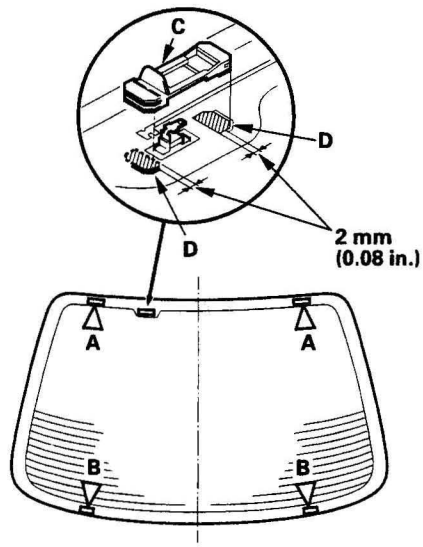
    - Be sure the fasteners (and window antenna terminal base cover) line up with the alignment marks (D).
    - Be careful not to touch the rear window where adhesive will be applied.

    : **Apply primer here.**

    Fastener Locations

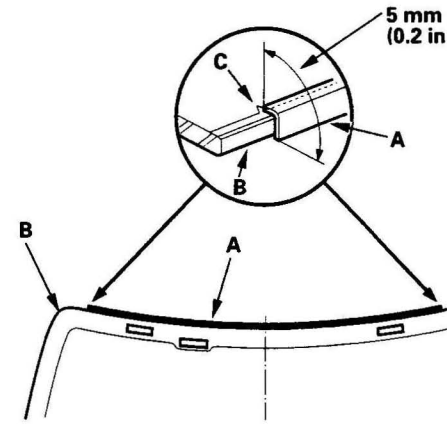
    A ▷: Clip, 2 **B ▷: Spacer, 2**





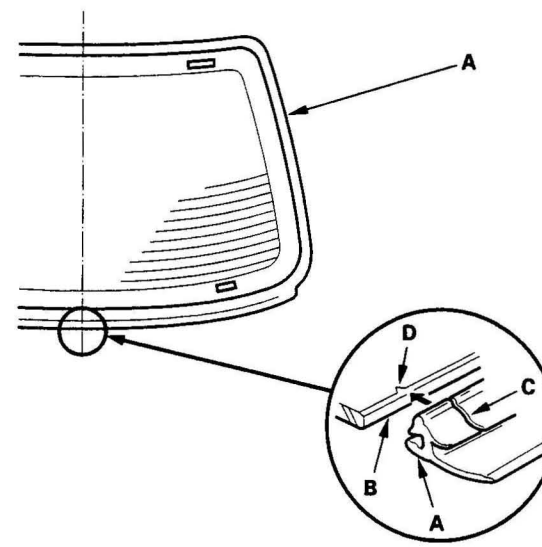
13. Apply the adhesive tape (A) (3M 4216, or equivalent) to the edge of the rear window (B):

    - Be sure the adhesive tape lines up with the alignment marks (C).
    - Be careful not to touch the rear window where adhesive will be applied.



14. Glue the molding (A) around the edge of the rear window (B):

    - Be sure the joint (C) lines up with the alignment mark (D).
    - Be careful not to touch the rear window where adhesive will be applied.



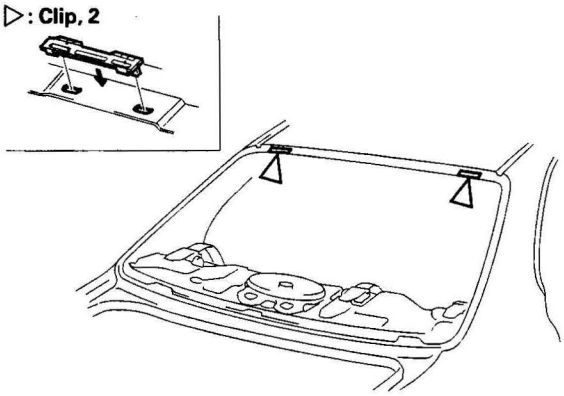
BACK

Protected by AR

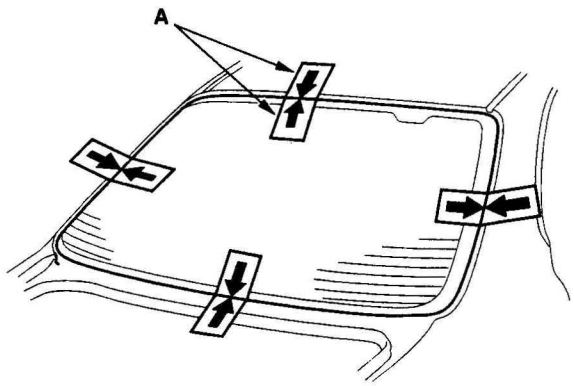
15. Install the clips.

Fastener Locations

▷: Clip, 2



16. Set the rear window in the opening, and center it. Make alignment marks (A) across the rear window and body with a grease pencil at the four points shown. Be careful not to touch the rear window where adhesive will be applied.

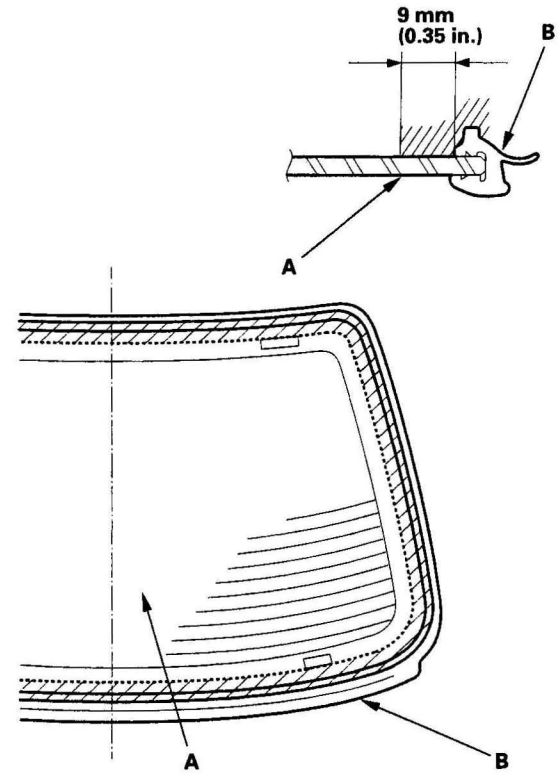


17. Remove the rear window.

18. With a sponge, apply a light coat of glass primer along the edge of the rear window (A) and molding (B) as shown, then lightly wipe it off with gauze or cheesecloth:

- Do not apply body primer to the rear window, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the rear window properly, causing a leak after the rear window is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

: Apply glass primer here.



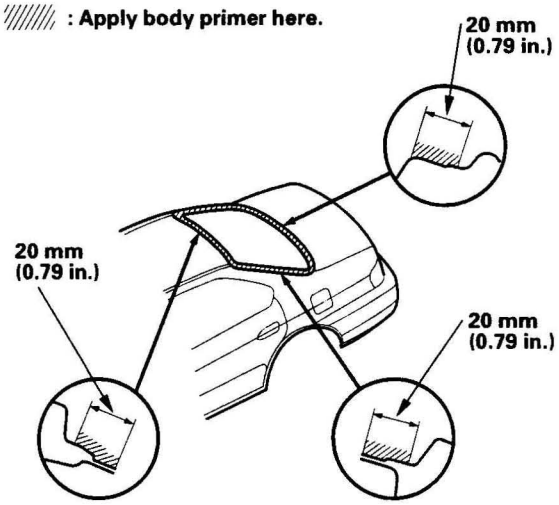
(cont'd)

Protected by AR

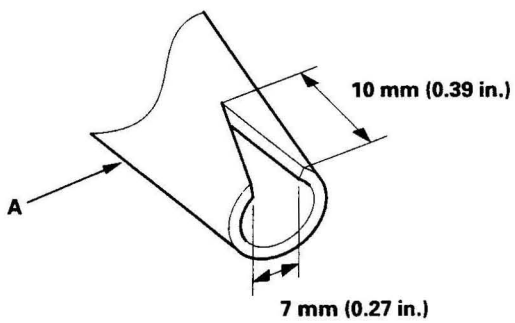
Rear Window Replacement (cont'd)

19. With a sponge, apply a light coat of body primer to the original adhesive remaining around the rear window opening flange. Let the body primer dry for at least 10 minutes:

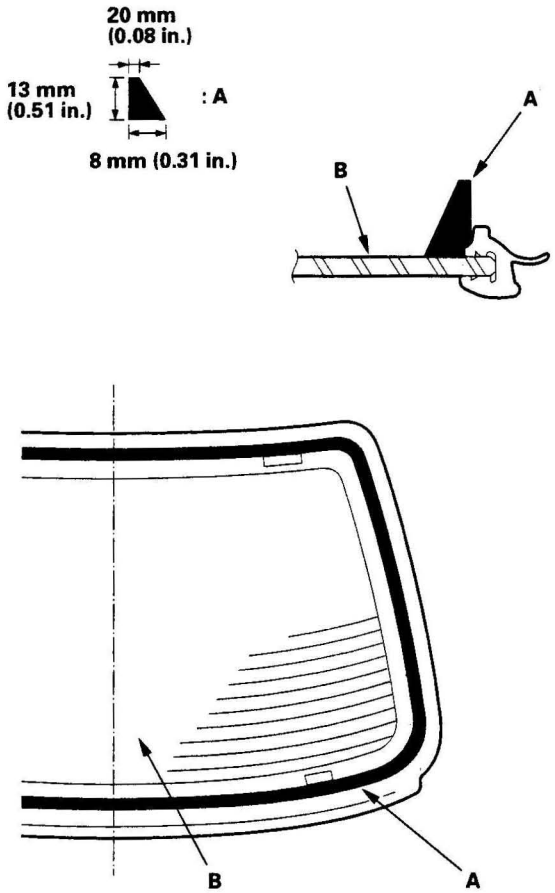
    - Do not apply glass primer to the body, and do not get glass and body primer sponges mixed up.
    - Never touch the primed surfaces with your hands.



20. Before filling a cartridge, cut a "V" in the end of the nozzle (A) as shown.



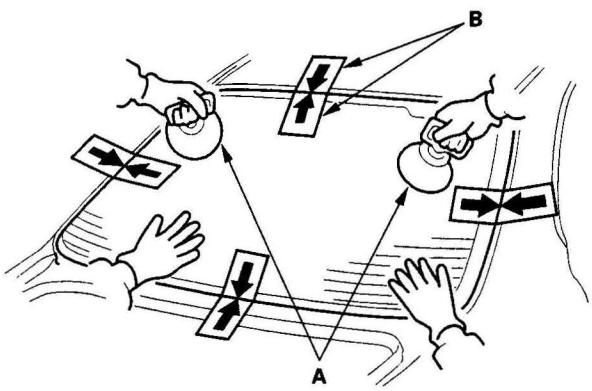
21. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive (A) around the edge of the rear window (B) as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



BACK

Protected by AR

22. Use suction cups (A) to hold the rear window over the opening, align it with the alignment marks (B) you made in step 16, and set it down on the adhesive. Lightly push on the rear window until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.



23. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the rear window, use a soft shop towel dampened with alcohol.

24. Let the adhesive dry for at least 1 hour, then spray water over the rear window and check for leaks. Mark the leaking areas, let the rear window dry, then seal with sealant. Let the vehicle stand for at least 4 hours after rear window installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.

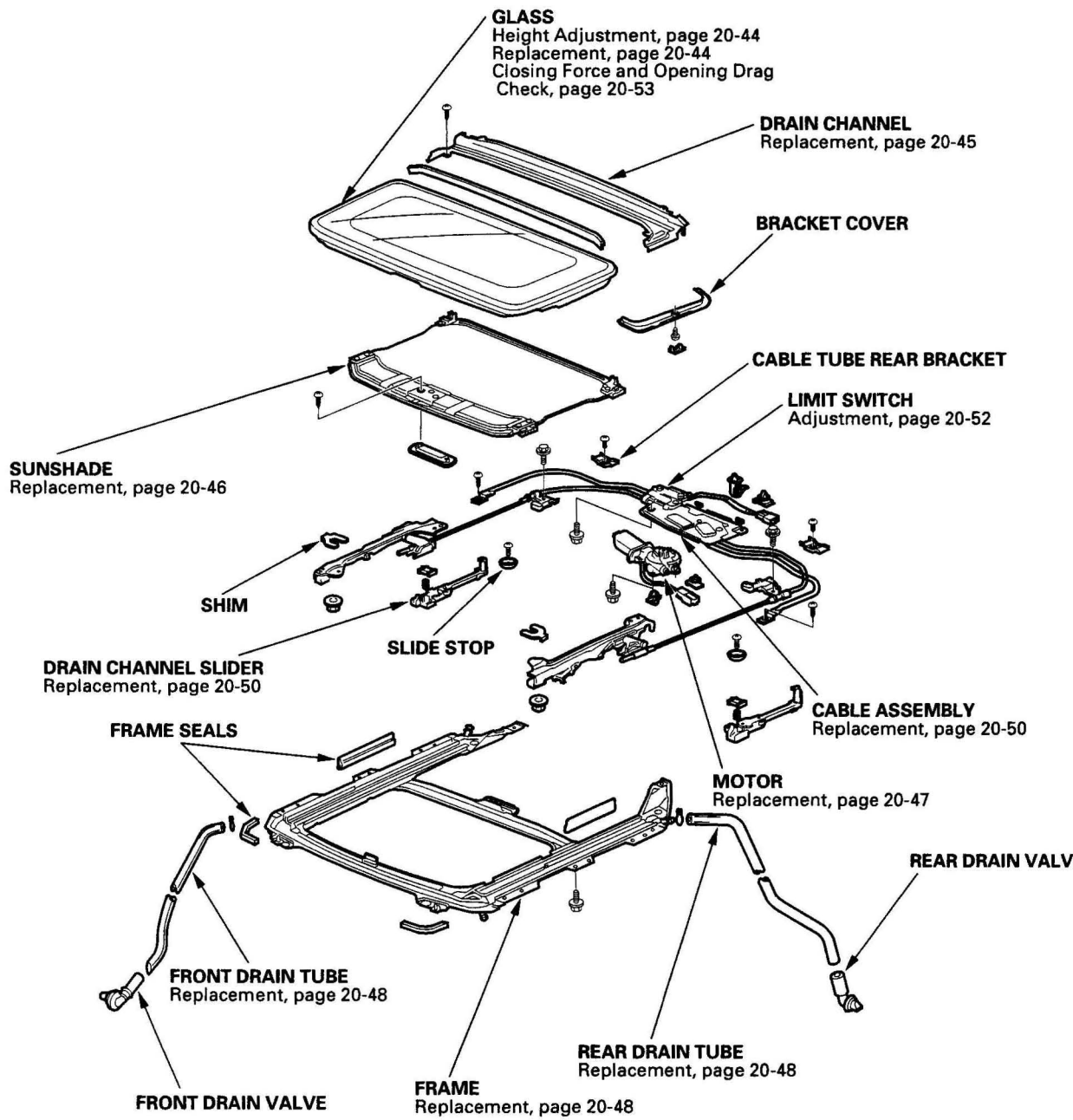
25. Reinstall all remaining removed parts.

    NOTE: Advise the customer not to do the following things for 2 to 3 days:

    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

Protected by AR

Component Location Index



BACK

Protected by AR

Symptom Troubleshooting Index

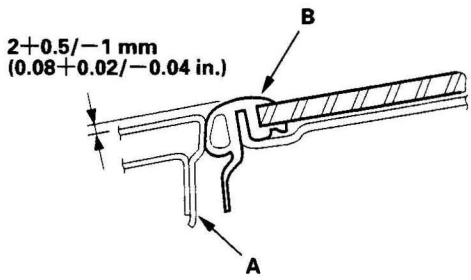
Symptom	Diagnostic procedure	Also check for
Water leaks	1. Check for a clogged drain tube. 2. Check for a gap between the glass weatherstrip and the roof panel. 3. Check for a defective or an improperly installed glass weatherstrip. 4. Check for a gap between the drain seal and the roof panel.	Glass height adjustment
Wind noise	1. Check for excessive clearance between the glass weatherstrip and the roof panel.	Glass height adjustment
Motor noise	1. Check for a loose motor. 2. Check for a worn gear or bearing. 3. Check for a deformed cable assembly.	Check closing force
Glass does not move, but motor turns	1. Check for a defective gear, inner cable, or clutch. 2. Check for foreign matter stuck between the guide rail and the slider. 3. Check for a loose inner cable. 4. Make sure the cable assembly is attached properly.	
Glass does not move and motor does not turn (glass can be moved with moonroof wrench)	1. Check for a blown fuse. 2. Check for a faulty moonroof switch. 3. Check the open/close-tilt/close switches. 4. Check for a run down battery. 5. Check for a defective motor. 6. Check for a faulty relay.	

Protected by AR

Moonroof

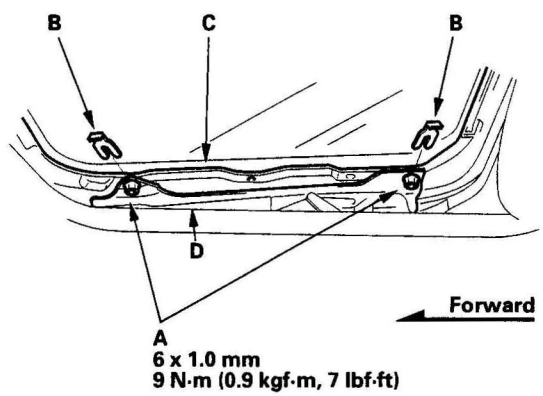
Glass Height Adjustment

The roof panel (A) should be even with the glass weatherstrip (B), to within 2+0.5/−1 mm (0.08+0.02/−0.04 in.) all the way around. If not, make the following adjustment:



1. Open the glass all the way, and remove the bracket cover.
2. Loosen the nuts (A), and install the shims (B) between the glass frame (C) and glass bracket (D) on each side.

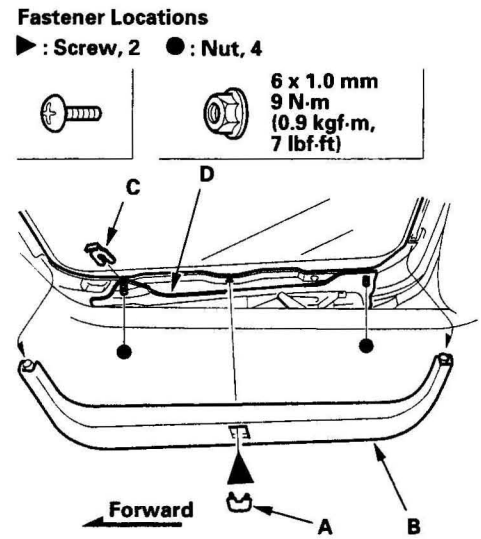
   Shim thickness: Front and rear max. 2 mm (0.08 in.)



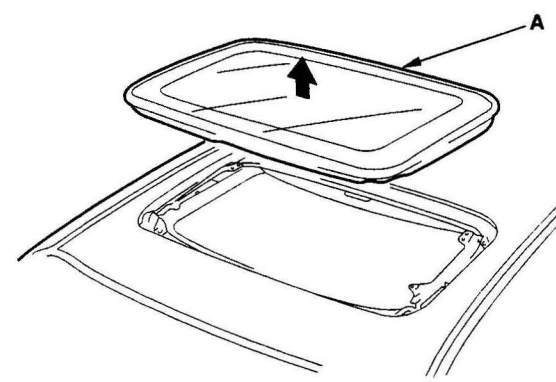
3. Repeat on opposite side if necessary.

Glass Replacement

1. Tilt the glass all the way up.
2. Slide the sunshade all the way back.
3. Remove the caps (A) and screws, then remove both bracket covers (B). Remove the nuts and shims (C) from both glass brackets (D).



4. Remove the glass (A) by lifting it up. Do not damage the roof panel.



5. Install the glass in the reverse order of removal, and adjust the glass height.
6. Check for water leaks. Use free-flowing water from a hose without a nozzle. Do not use high-pressure spray, or a car wash to test.

BACK

Protected by AR

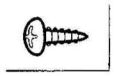
Drain Channel Replacement

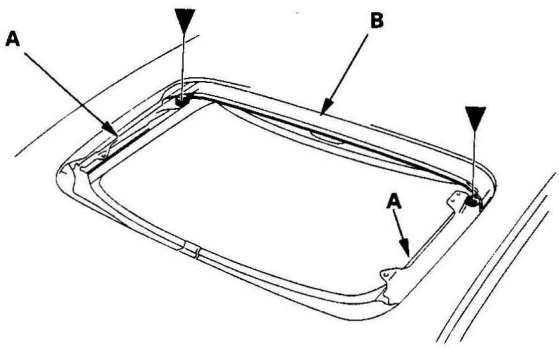
1. Remove the moonroof glass (see page 20-44).

2. With the moonroof wrench, move both glass brackets (A) to the position where the moonroof normally pivots down, and remove the screws securing the drain channel (B).

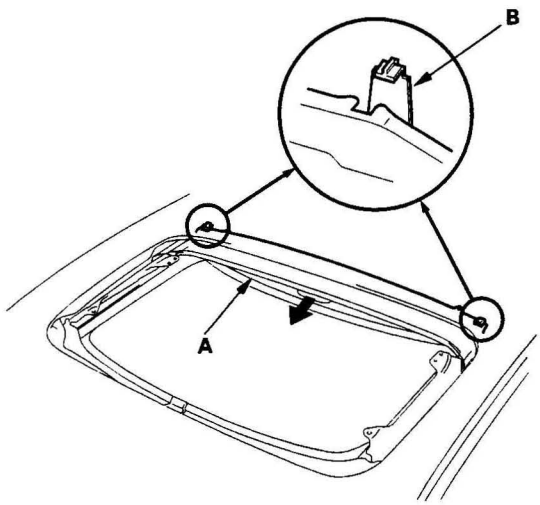
Fastener Locations

▶ : Screw, 2

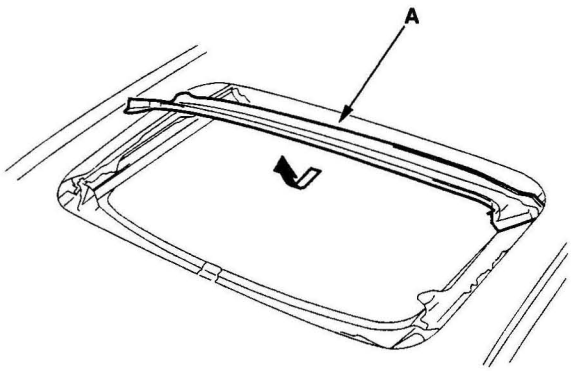




3. Release the drain channel (A) from both hooks (B) of the drain channel slider by pulling the drain channel forward.



4. Remove the drain channel (A).



5. Install the channel in the reverse order of removal, and note these items:

   - Push the drain channel onto the hooks until a faint click is heard.
   - Check the glass height adjustment.

6. Check for water leaks. Let the water run freely from a hose without a nozzle. Do not use a high-pressure spray, or a car wash to test.

BACK

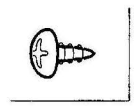
Protected by AR

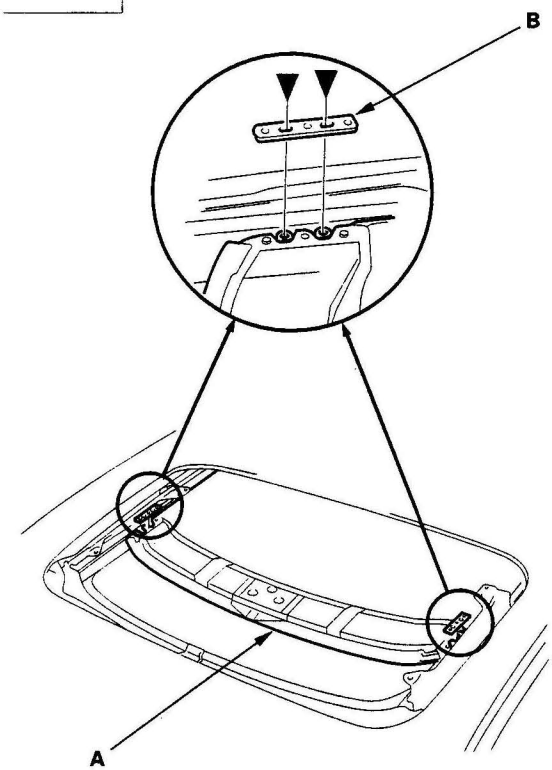
Sunshade Replacement

1. Remove the drain channel (see page 20-45).
2. Slide the sunshade (A) until you can see both sunshade slider spacers (B).

Fastener Locations

▶ : Screw, 4



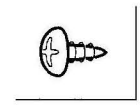


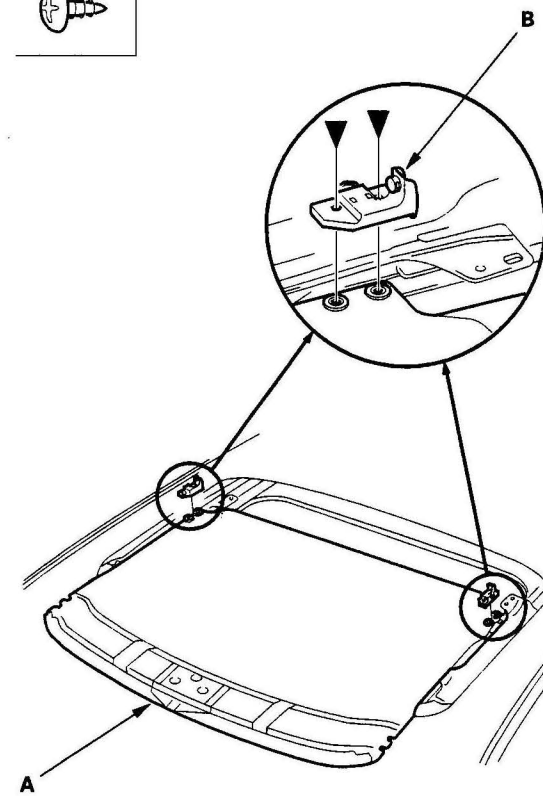
3. Remove the screws, then remove both spacers.

4. While lifting the front portion of the sunshade (A), move the sunshade forward until you can see both sunshade rear hooks (B). Do not damage the sunshade and hooks.

Fastener Locations

▶ : Screw, 4



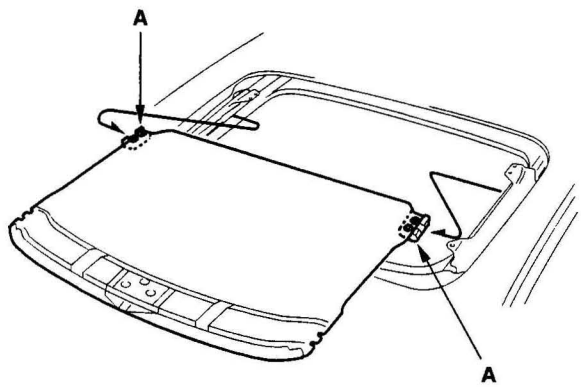


5. Remove the screws, then remove both hooks.

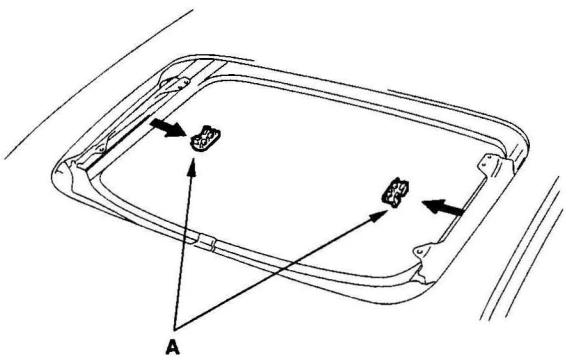
BACK

Protected by AR

6. Release both rear sunshade base sliders (A) from the guide rail portions of the frame, then remove the sunshade.



7. Remove both front sunshade base sliders (A).



8. Install the sunshade in the reverse order of removal, and check the glass height adjustment (see page 20-44).

9. Check for water leaks. Let the water run freely from a hose without a nozzle. Do not use a high-pressure spray, or a car wash to test.

Motor Replacement

1. Remove the headliner (see page 20-59).

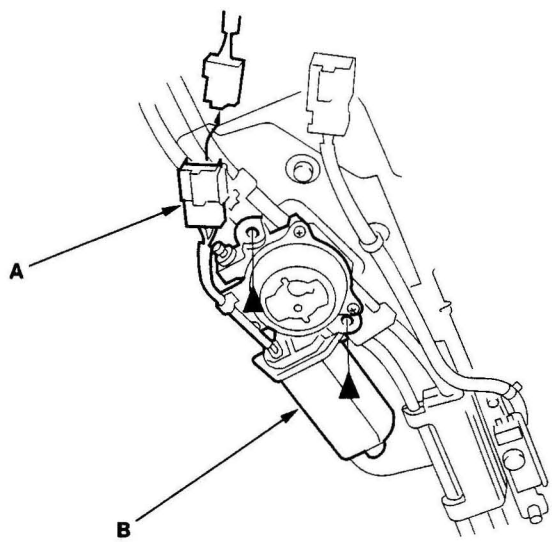
2. Put on gloves to protect your hands. Disconnect and detach the connector (A), and remove the bolts, then remove the motor (B).

Fastener Locations

▶ : Bolt, 2



6 X 1.0 mm
9 N·m
(0.9 kgf·m,
7 lbf·ft)



3. Install the motor in the reverse order of removal, and note these items:

- Make sure the connector is plugged in properly.
- Check the motor operation.

BACK

Protected by AR

Frame and Drain Tube Replacement

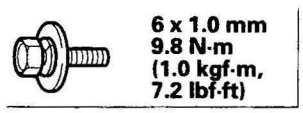
1. Remove these items:

   - Headliner (see page 20-59)
   - Moonroof glass (see page 20-44)

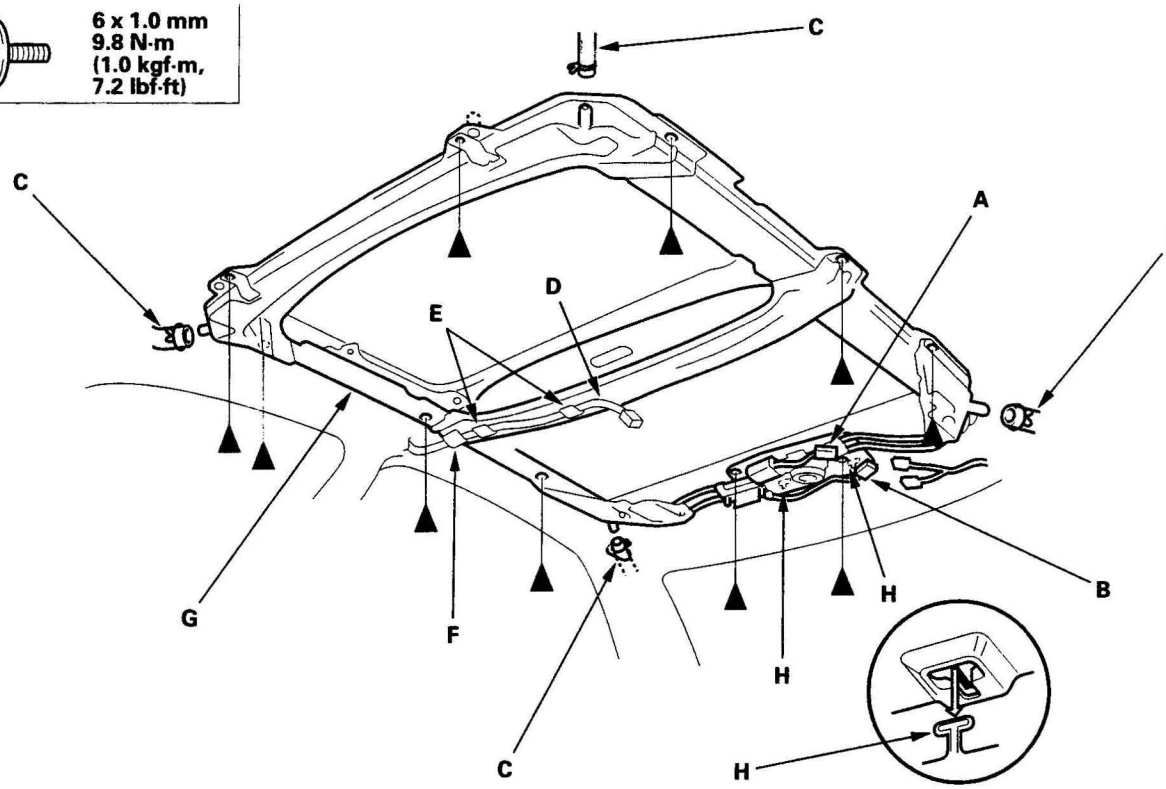
2. Put on gloves to protect your hands. Disconnect the motor connector (A), open/close-tilt/close switch connector (B), and the drain tubes (C).

Fastener Locations

▶ : Bolt, 10



6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



3. Remove the ceiling light harness (D) by detaching the harness clips (E), and remove the harness cushion (F).

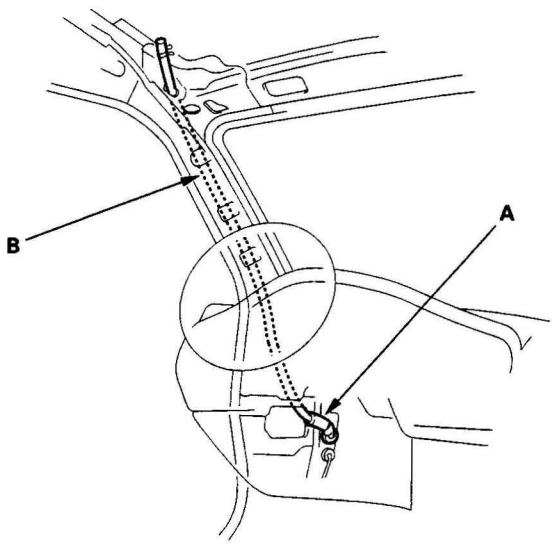
4. With an assistant holding the frame (G), remove the bolts, and release the rear hooks (H) by moving the frame forward, then remove the frame. Remove the front bolts last.

5. With the help of an assistant, carefully remove the frame through the door opening. Take care not to scratch the interior trim and body, or tear the seat covers.

BACK

Protected by AR

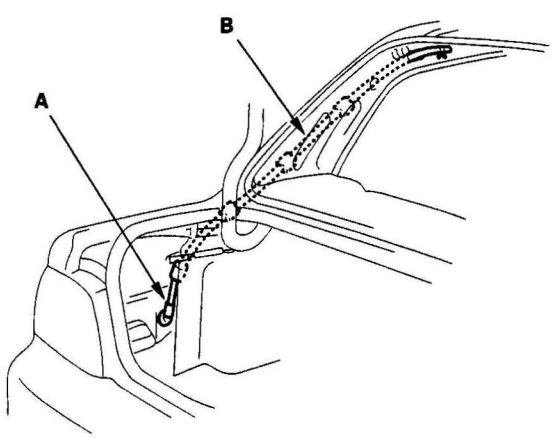
6. To remove a front drain valve (A) from the body, remove the kick panel, left or right (see page 20-55). Tie a string to the end of the drain tube, then pull the front drain tube (B) down out of the front pillar.



7. To remove a rear drain valve (A) from the body, remove these parts (see page 20-58):

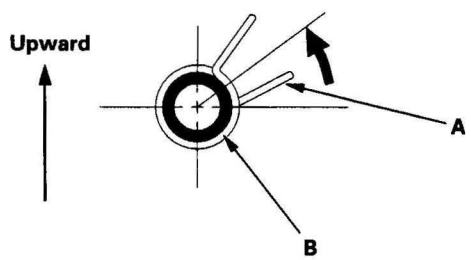
   - Trunk floor
   - Trunk rear trim panel
   - Trunk side pocket, left or right

   Tie a string to the top end of the drain tube, then pull back the trunk side trim panel and pull the drain tube down out of the pillar.



8. Install the frame and drain tube in the reverse order of removal, and note these items:

   - Before installing the frame, clear the drain tubes and drain valves using compressed air.
   - Check the frame seal.
   - Clean the surface of the frame.
   - When installing the frame, first attach the rear hooks into the body holes.
   - Make sure the connectors are plugged in properly.
   - When connecting the drain tube, slide it over the frame nozzle at least 10 mm (0.39 in.).
   - Install the tube clip (A) on the drain tube (B) as shown.



9. Check for water leaks. Let the water run freely from a hose without a nozzle. Do not use a high-pressure spray, or a car wash to test.

BACK

Protected by AR

Drain Channel Slider and Cable Assembly Replacement

1. Remove the frame (see page 20-48).

2. Remove these parts from the frame:

   - Sunshade (see page 20-46)
   - Moonroof motor (see page 20-47)

3. Put on gloves to protect your hands. Remove the slide stops (A), cable tube rear brackets (B), cable tube side bracket mounting bolts (C) and the cable tube mounting screws (D) from both sides of the frame (E).

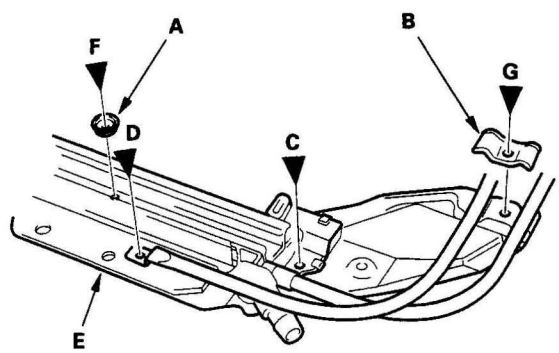
Fastener Locations

C ▶ : Bolt, 2 — 6 x 1.0 mm 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

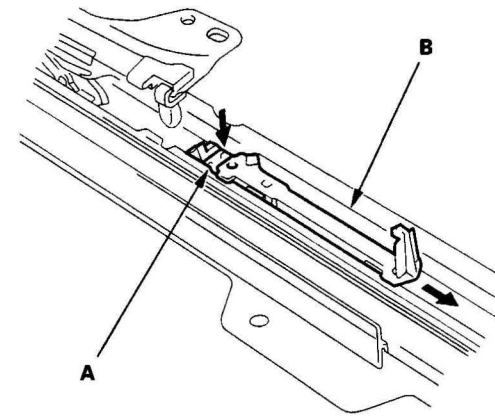
D ▶ : Screw, 2

F ▶ : Screw, 2

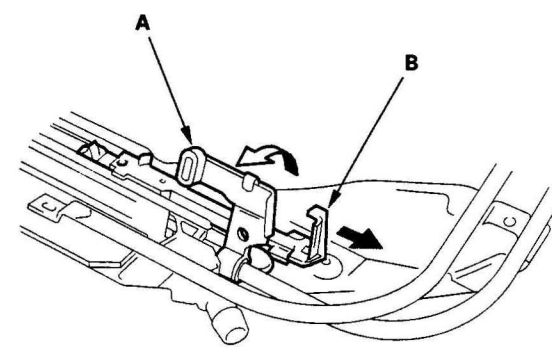
G ▶ : Screw, 2



4. While pushing down on the hook (A), slide the drain channel sliders (B) back on both sides.



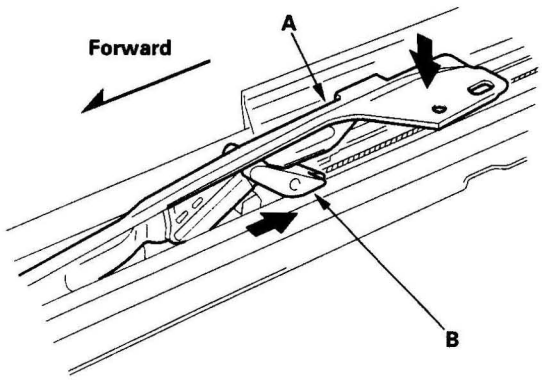
5. Turn both cable tube side brackets (A) up, and remove the drain channel sliders (B).



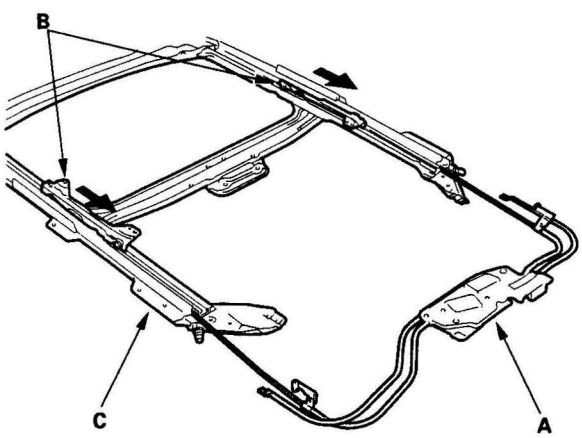
BACK

Protected by AR

6. Pivot the glass bracket (A) down by sliding the link lifter (B) back, then slide both glass brackets back with the link lifter.

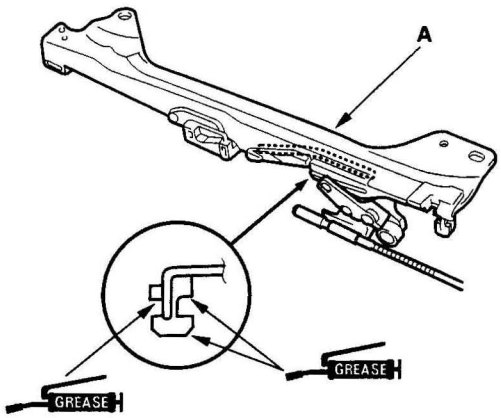


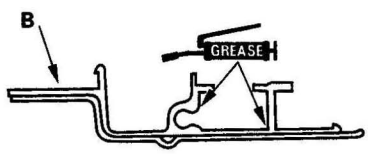
7. Slide the cable assembly (A) and both glass brackets (B) back, then remove them from the frame (C).



8. Install the sliders and cables in the reverse order of removal, and note these items:

- Damaged parts should be replaced.
- Apply multipurpose grease to the glass bracket (A) and guide rail portion of the frame (B) indicated by the arrows.
- Before reinstalling the moonroof motor, make sure both link lifters are parallel, and in the fully closed position.
- Before reinstalling the moonroof motor, install the frame and glass, then check the opening drag (see page 20-53).

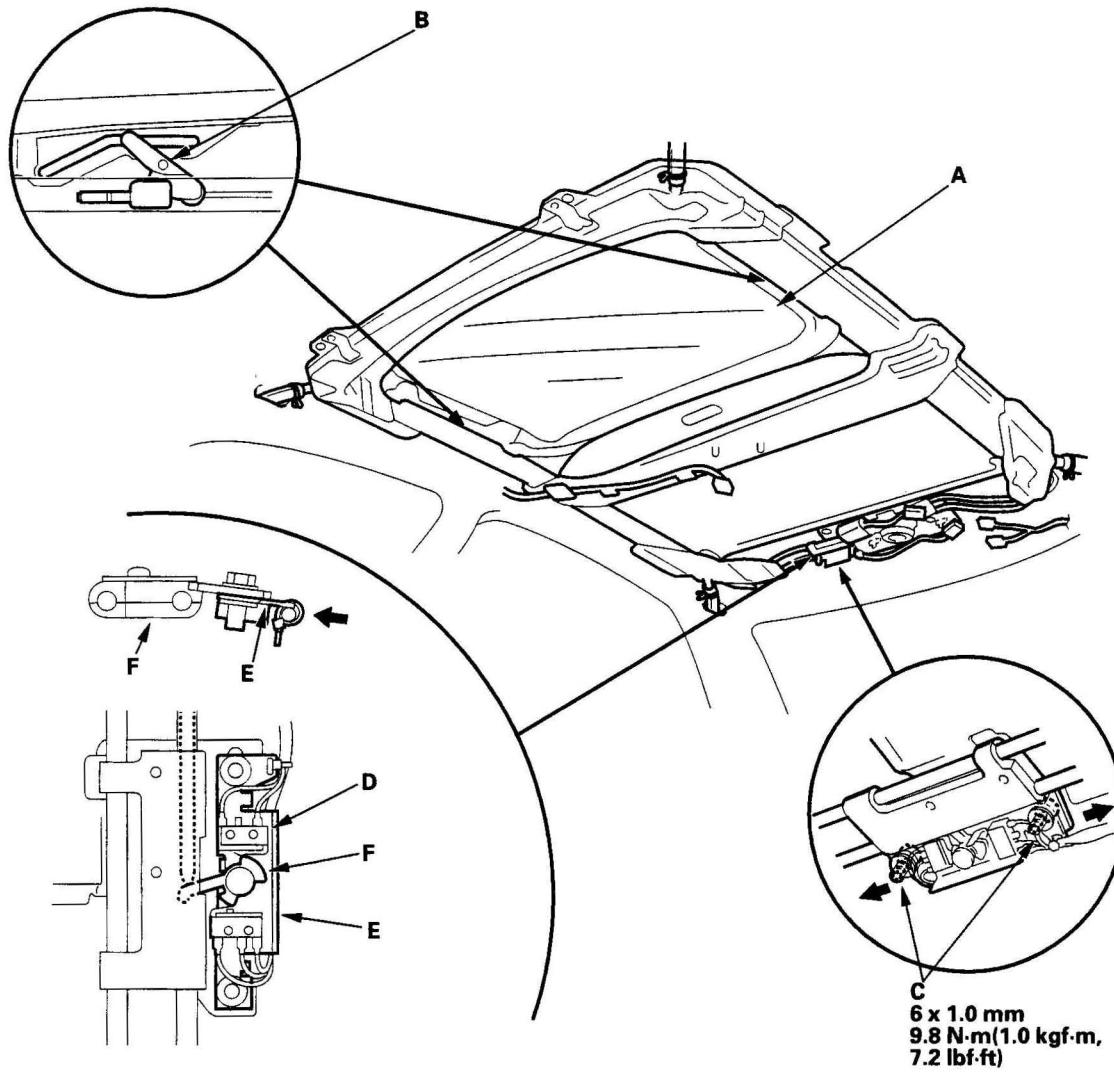




Protected by AR

Limit Switch Adjustment

1. Remove the headliner (see page 20-59).
2. With the moonroof wrench, close the glass (A) fully:
   - Make sure both link lifters (B) are parallel, and in the position shown.
   - Check the glass fit to the roof panel and the glass height (see page 20-44).



3. With an open-end wrench, loosen the position switch mounting bolts (C).
4. Adjust the limit switch (D):
   - Move the switch plate (E) a little at a time, then secure it at the position where you hear a faint click when the switch cam (F) pushes the position switch (open/close).
   - Check that the switch plate contacts the switch bracket (F).
5. Check the operation of the glass (from the tilt-up position to the fully closed position, and from the fully open position to the fully closed position) by operating the moonroof switch.

BACK

Protected by AR

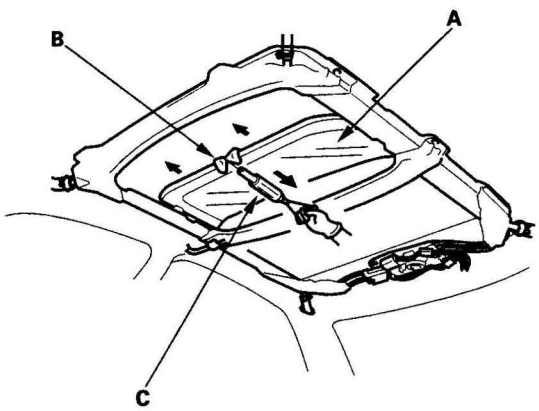
Closing Force and Opening Drag Check

1. Remove the headliner (see page 20-59).

2. Closing force check:

   - With a shop towel (A) on the leading edge of the glass (B), attach a spring scale (C) as shown.
   - Have an assistant hold the switch to close the glass while you measure the force required to stop it.
   - Read the force as soon as the glass stops moving, then immediately release the switch and spring scale.

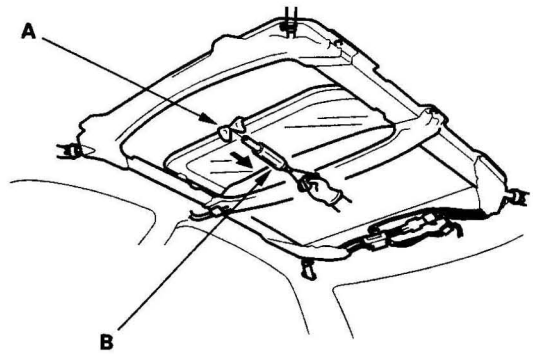
   Closing Force: 200–290 N (20–30 kgf, 44–66 lbf)



3. If the force is not within specification, remove the moonroof motor (see page 20-47), then check:

   - The gear portion and the inner cable for breakage and damage. If the gear portion is broken, replace the motor. If the inner cable is damaged, remove the frame (see page 20-48), and replace the cable assembly (see page 20-50).
   - The moonroof motor (see page 22-218). If the motor fails to run or doesn't turn smoothly, replace it.
   - The opening drag. Go to step 4.

4. Opening drag check: Protect the leading edge of the glass with a shop towel (A). Measure the effort required to open the glass using a spring scale (B) as shown.



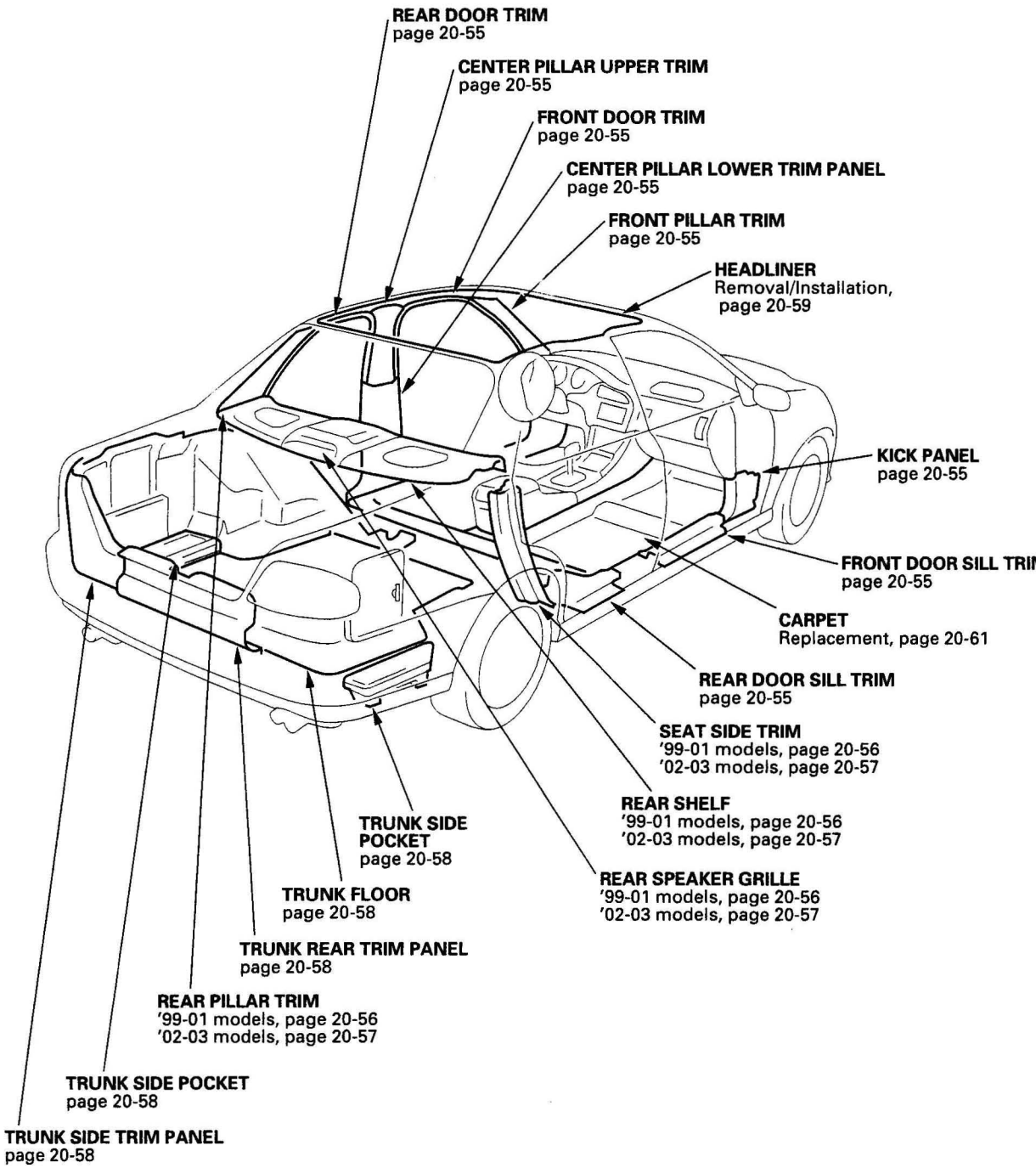
5. If the load is over 40 N (4 kgf, 9 lbf), check:

   - The side clearance and glass height adjustment (see page 20-44).
   - For broken or damaged sliding parts. If any sliding parts are damaged, replace them.

BACK

Protected by AR

Component Location Index



BACK

Protected by AR

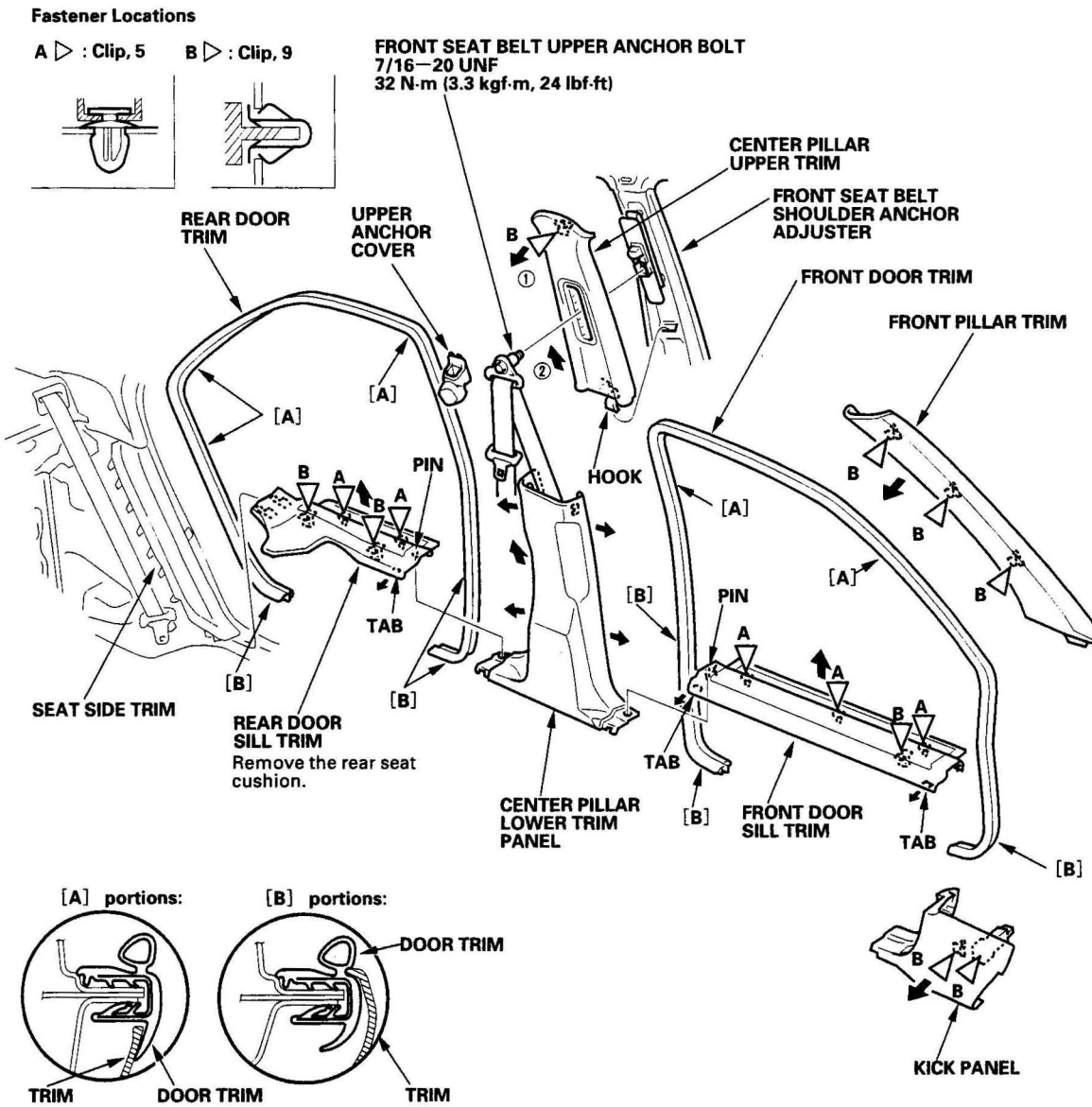
Trim Removal/Installation - Door Area

NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

1. Remove the trim as shown.

2. Install the trim in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Apply liquid thread lock to the front seat belt upper anchor bolt before installation.
   - Before installing the anchor bolts, make sure there are no twists or kinks in the belts.



BACK

Protected by AR

Trim Removal/Installation - Rear Shelf Area

'99-01 Models

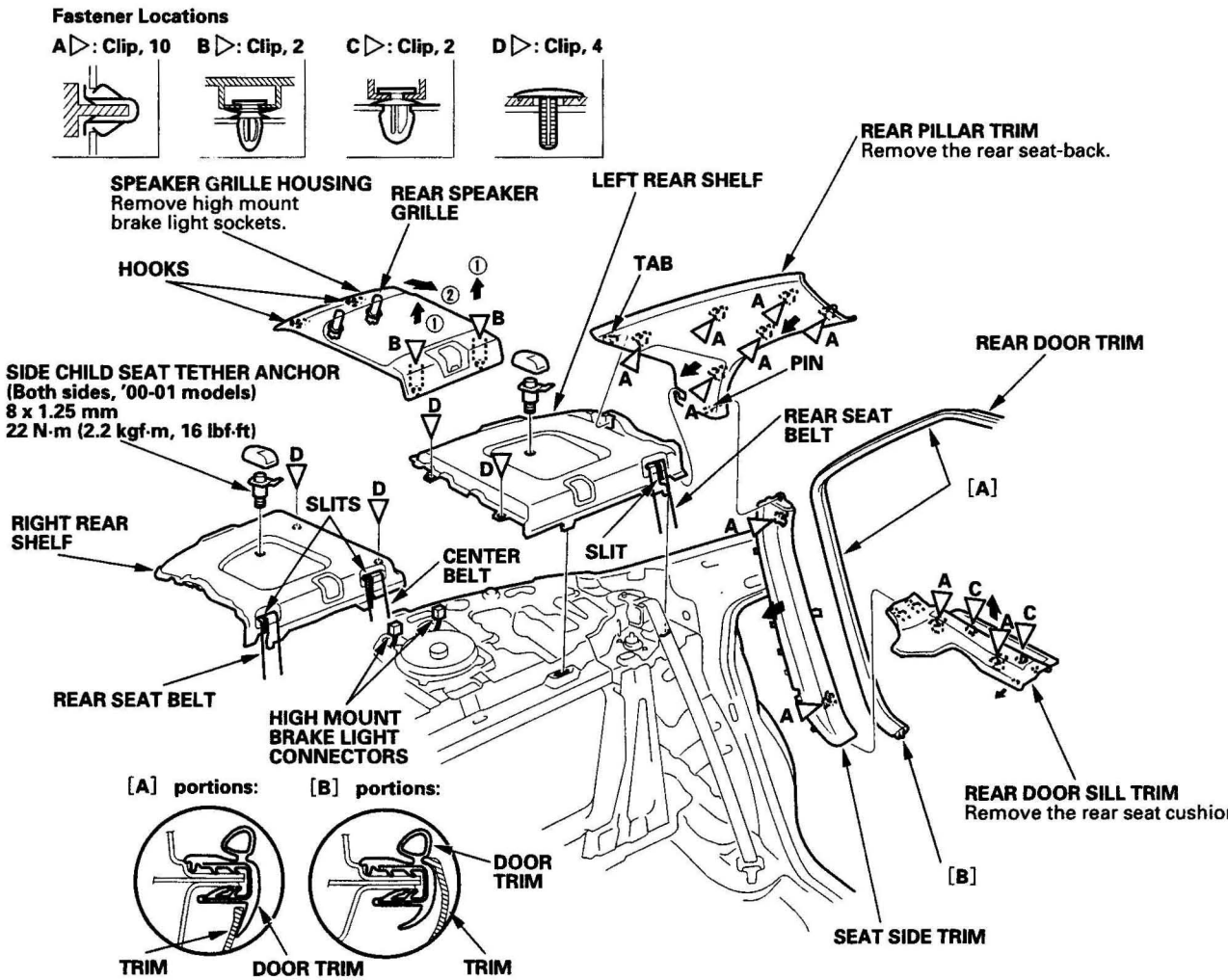
NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

1. On '00-01 models, remove the child seat tether anchors to remove the speaker grille housing and both rear shelves (see page 23-12).

2. Remove the trim as shown.

3. Install the trim in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - When installing the rear shelves, slip the rear seat belts and center belt through the slits in the rear shelf.
   - Make sure the high mount brake light connectors are plugged in properly.
   - '00-01 models: Make sure the child seat tether anchors are installed securely.



BACK

Protected by AR

'02-03 Models

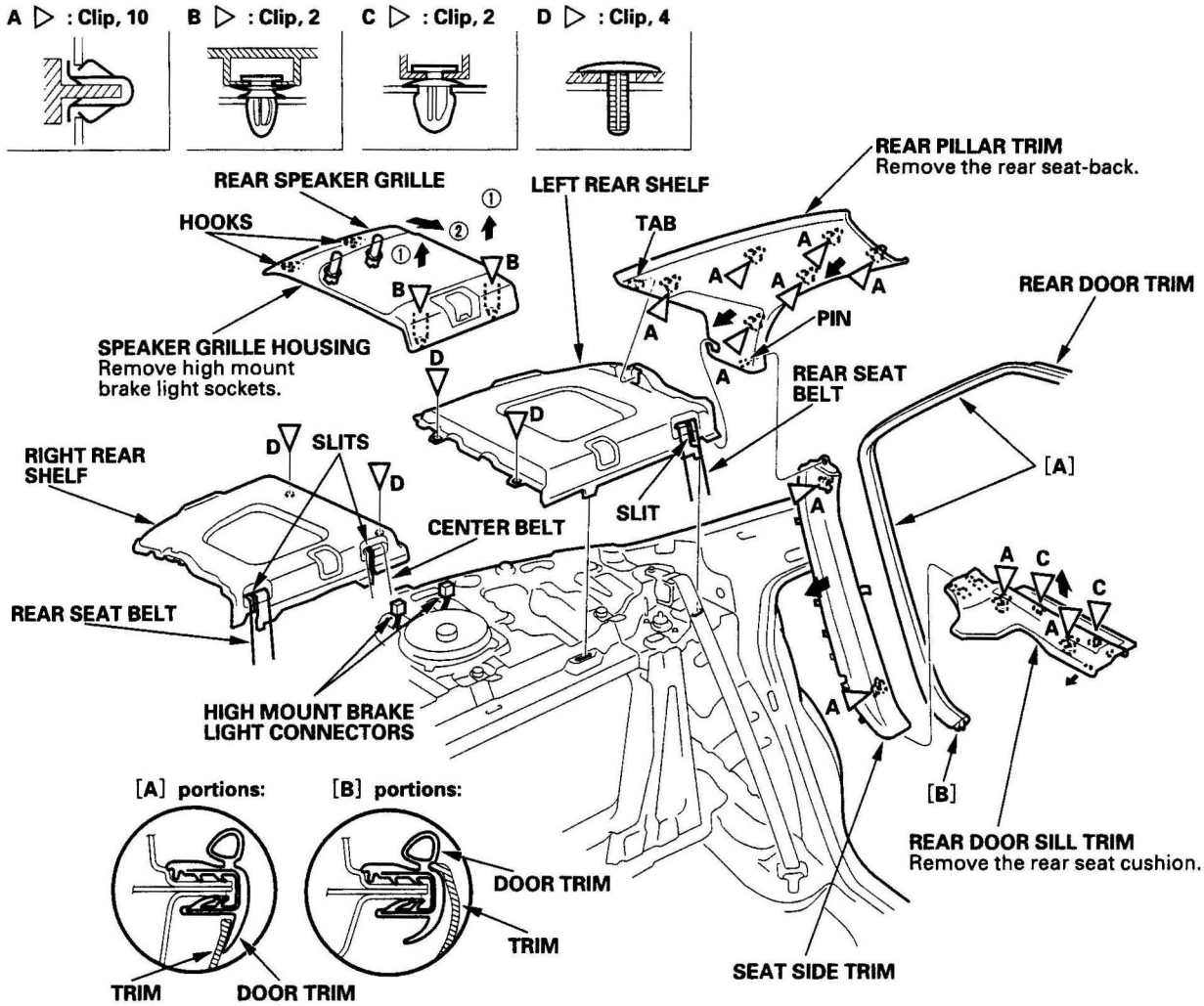
NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

1. Remove the trim as shown.

2. Install the trim in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - When installing the rear shelves, slip the rear seat belts and center belt through the slits in the rear shelf.
   - Make sure the high mount brake light connectors are plugged in properly.

Fastener Locations



BACK

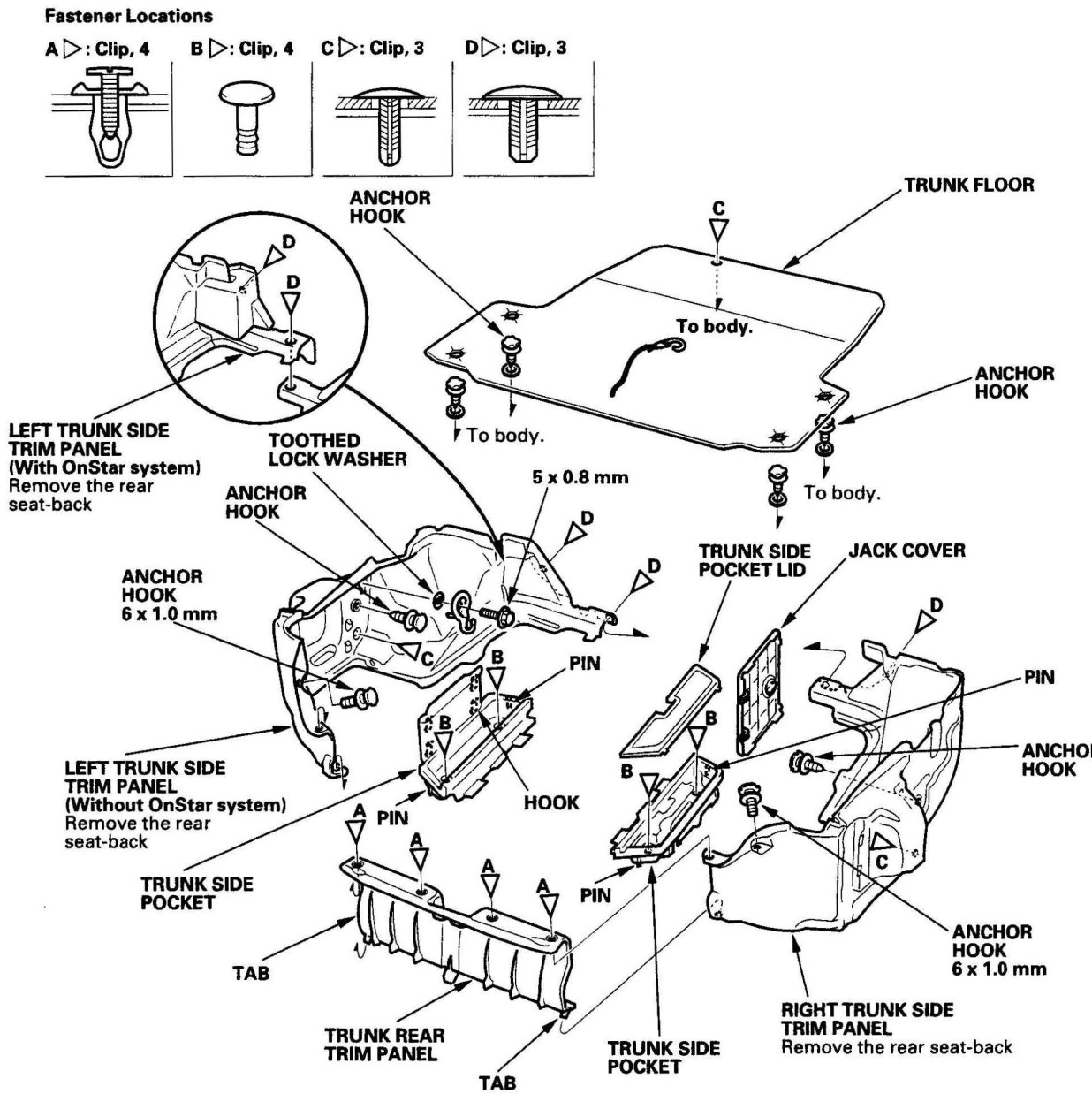
Protected by AR

Trim Removal/Installation - Trunk Area

NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

1. Remove the trim as shown.

2. Install the trim in the reverse order of removal, and replace any damaged clips.



BACK

Protected by AR

Headliner Removal/Installation

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend and scratch the headliner.
- Be careful not to damage the dashboard and other interior trim.

1. Remove these items:
   - Front pillar trim, both sides, and the center pillar upper trim, both sides (see page 20-55)
   - Ceiling light (see page 22-181)
   - Rear window antenna terminal cover (see step 2 on page 20-36)

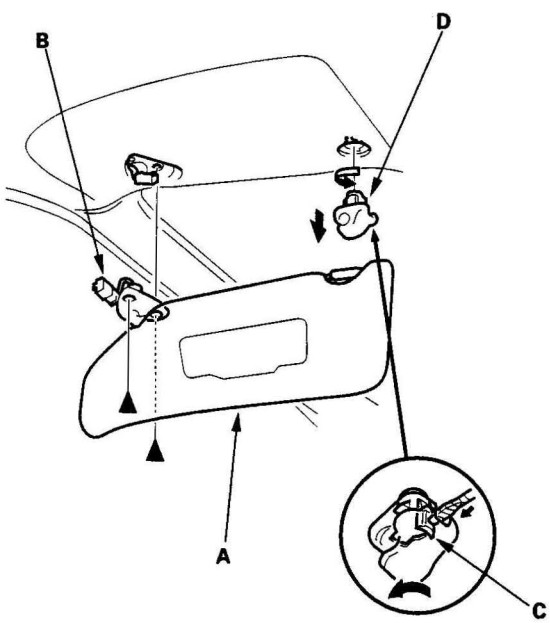
2. Remove the sunvisor (A) from each side. Disconnect the vanity mirror light connectors (B) (driver's and passenger's). Push in the tab (C) and twist the holder (D), then remove it.

Fastener Locations

▶ : Screw, 4



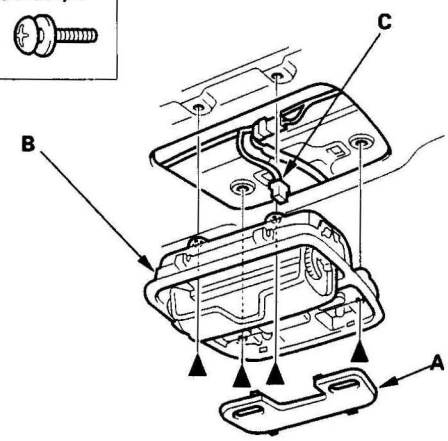
5 x 0.8 mm
4 N·m
(0.4 kgf·m,
3 lbf·ft)



3. Remove the roof console.
   - –1 Remove the lens (A).
   - –2 Remove the screws.
   - –3 Pull out the roof console (B), and disconnect the spotlight connector (C).

Fastener Locations

▶ : Screw, 4

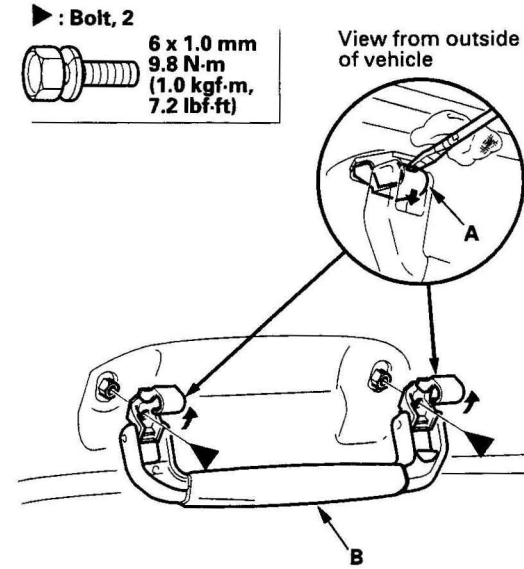


4. Lower the grab handle, then pull back the caps (A). Remove the bolts, then remove the grab handles (B) (driver's and each passenger's).

Fastener Locations

▶ : Bolt, 2

6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



(cont'd)

BACK

Protected by AR

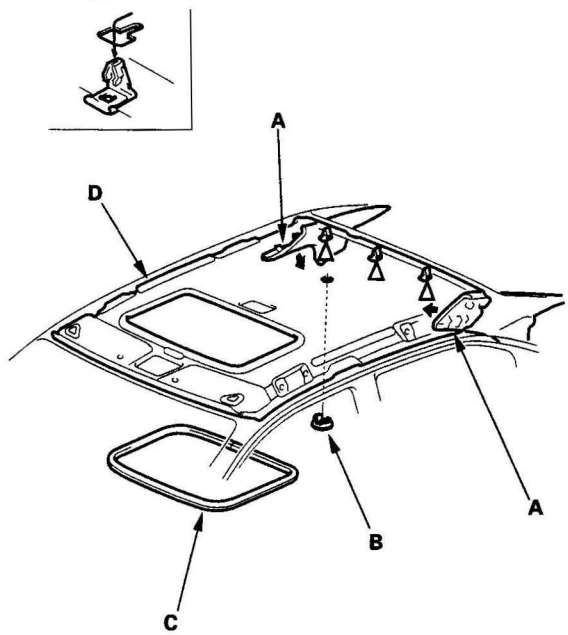
Headliner Removal/Installation (cont'd)

5. Remove the headliner.

   –1 Remove the upper portion of the rear pillar trim (A) from each side, '99-01 models (see page 20-56), '02-03 models (see page 20-57).
   –2 Remove the socket plug (B) and roof trim (C).
   –3 With the help of an assistant, detach the clips, and lower the headliner (D).
   –4 Remove the headliner through the front passenger's door opening.

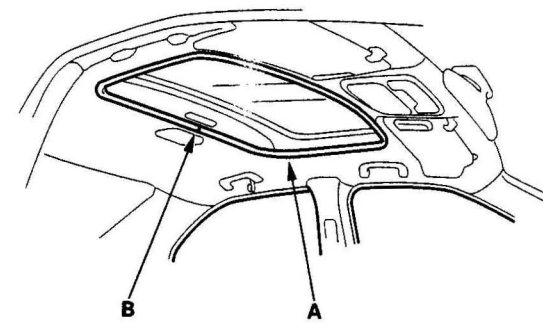
Fastener Locations

▶ : Clip, 3



6. Install the headliner in the reverse order of removal, and note these items:

   • When reinstalling the headliner through the door opening, be careful not to fold or bend it. Also, be careful not to scratch the body.
   • When reinstalling the roof trim (A), install the joint (B) toward the rear center.
   • Check that both sides of the headliner are securely attached to the trim.



BACK

Protected by AR

Carpet Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-17) in the SRS section before performing repairs or service.

NOTE:
- Put on gloves to protect your hands.
- Take care not to damage, wrinkle, or twist the carpet.
- Be careful not to damage the dashboard or other interior trim pieces.

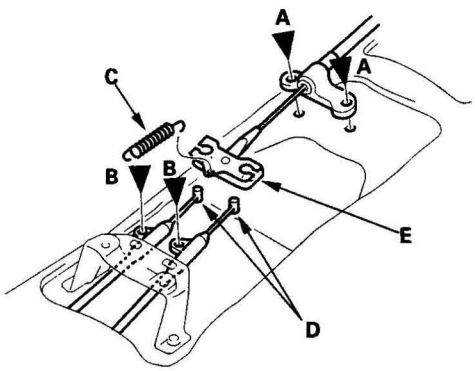
1. Remove these items:
   - Front seats, both sides (see page 20-78)
   - Dashboard lower cover (see page 20-65)
   - Rear console (see page 20-62)
   - Console panel (see page 20-63)
   - Rear vent duct (see page 20-70)
   - Rear seat cushion (see page 20-95)
   - Center pillar lower trim panel, both sides, and the kick panel, both sides (see page 20-55).
   - Front seat belt lower anchor bolt, both sides (see page 23-4)
   - Fuel lid opener cover (see step 1 on page 20-137)

2. Remove the bolts (A,B), then remove the spring (C), and disconnect the parking brake cables (D) from the equalizer (E).

Fastener Locations

A ▶: Bolt, 2 B ▶: Bolt, 2

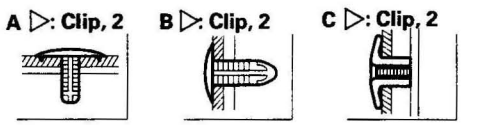
8 x 1.25 mm
22 N·m
(2.2 kgf·m,
16 lbf·ft)

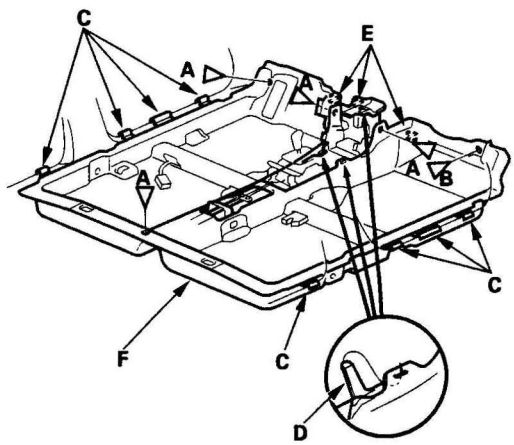


3. Remove the clips (A, B, C), and release the retainers (D), hooks (E) and fasteners (F), then remove the carpet (G).

Fastener Locations

A ▷: Clip, 2 B ▷: Clip, 2 C ▷: Clip, 2





4. Install the carpet in the reverse order of removal, and note these items:
   - Take care not to damage, wrinkle, or twist the carpet.
   - Make sure the seat harness is routed correctly.
   - Slip the slits in the carpet over the hooks.
   - Replace any damaged clips.
   - Make sure the parking brake cables are connected correctly. Asjust the parking brake cables (see page 19-6).

Protected by AR

Rear Console Removal/Installation

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to scratch the front seat, dashboard and related parts.

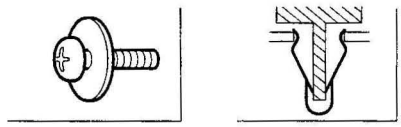
1. Remove the rear console as shown.

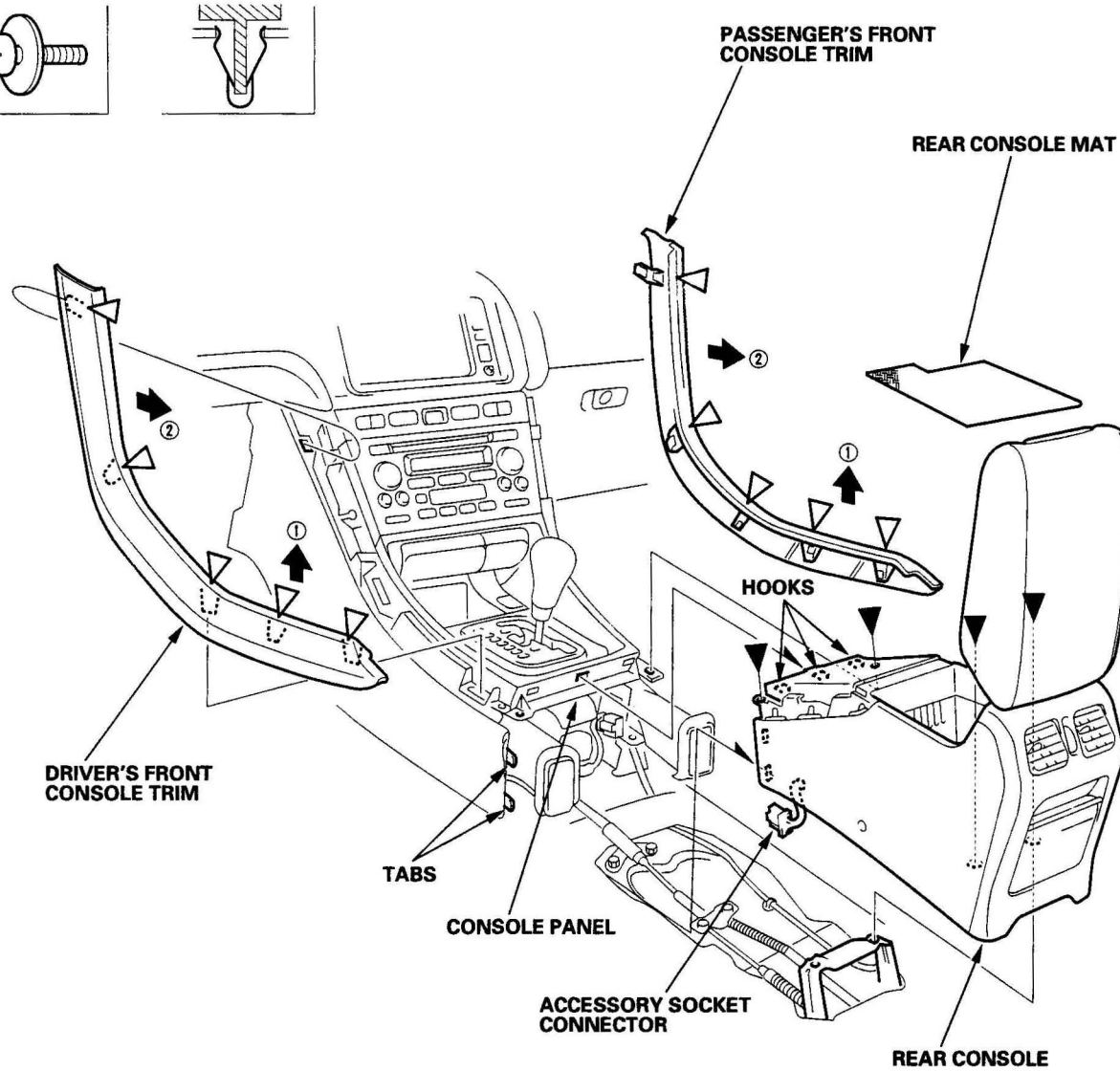
2. Install the console in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Make sure the connectors are plugged in properly.

Fastener Locations

▶: Screw, 4 ▷: Clip, 10





BACK

Protected by AR

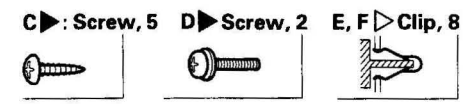
Console Panel Removal/Installation

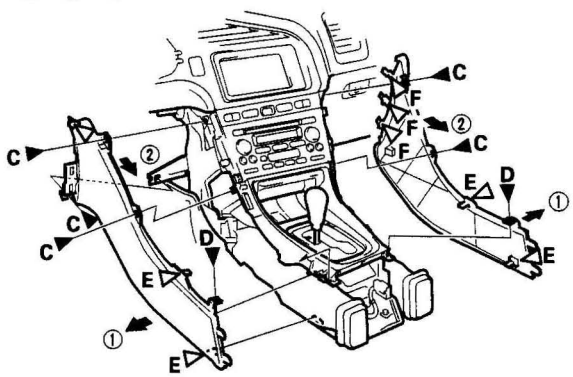
NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts to prevent damage.
- Take care not to scratch the front seat, dashboard, and related parts.

1. Remove these items:
   - Driver's and passenger's front console trim (see page 20-62)
   - Rear console (see page 20-62)
   - Dashboard lower cover (see page 20-66)

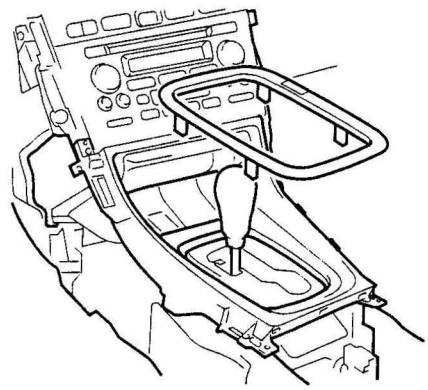
2. Remove the driver's front console cover (A) and passenger's front console cover (B).
   - –1 Remove the screw (C, D).
   - –2 Detach the rear clips (E) by pulling both covers outward.
   - –3 Pull both trim back to detach the front clips (F).

Fastener Locations

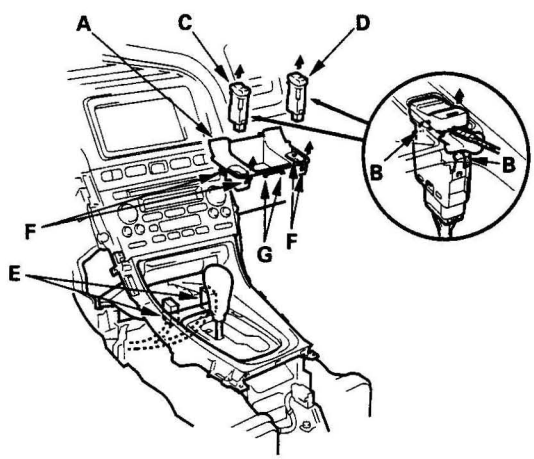




3. Remove the shift indicator trim ring.



4. Remove the console panel tray (A).
   - –1 Carefully insert a flat-tip screwdriver next to the clip (B), and detach the clips by prying on the driver's seat heater switch (C) and passenger's seat heater switch (D). Take care not to scratch the console panel tray.
   - –2 Pull out the switches, then disconnect the seat heater switch connector (E).
   - –3 Gently pull out the console panel tray to release the hooks (F) and tabs (G).



(cont'd)

BACK

Protected by AR

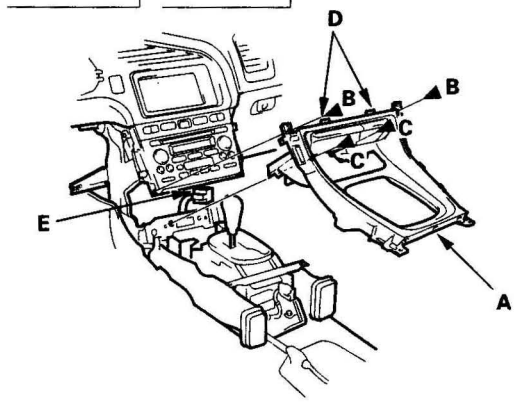
Console Panel Removal/Installation (cont'd)

5. Remove the console panel (A).

   -1 Remove the screws (B, C).
   -2 Release the tabs (D).
   -3 Disconnect the accessory socket connector (E).

Fastener Locations

B ▶: Screw, 2 C ▶ Screw, 2



6. Install the console panel in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Make sure the connectors are plugged in properly.

BACK

Protected by AR

Instrument Panel Removal/ Installation

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Take care not to scratch the dashboard and related parts.

1. Tilt the steering column down.

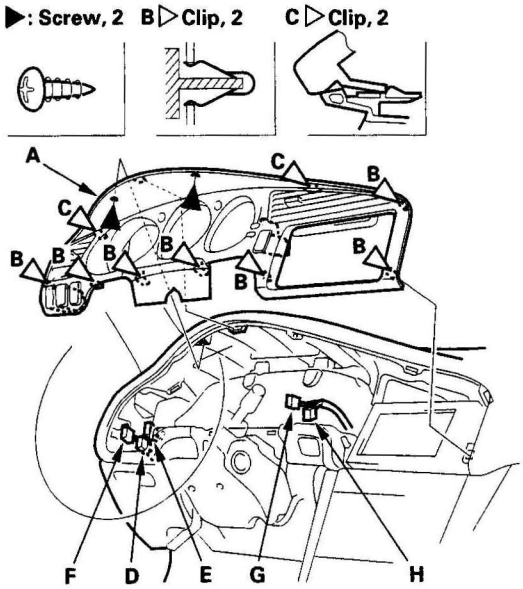
2. Remove the steering column upper cover (see page 17-27).

3. Remove the instrument panel (A).

   –1 Remove the screws.
   –2 Gently pull out along the bottom to release the lower clips (B), then along the top to release the remaining clips (B and C).
   –3 Disconnect the TCS/cruise control main switch connector (D) (3.2 TL) or VSA/cruise control main switch connector (D) (3.2 TL-S), front fog light switch connector ('02-03 models) (E), moonroof switch connector (F), select/reset switch connector (G) and hazard warning switch connector (H). Without navigation unit, disconnect the clock connector and climate control unit connectors.

Fastener Locations

▶: Screw, 2 B▷Clip, 2 C▷Clip, 2



4. Install the panel in the reverse order of removal, and make sure each connector is plugged in properly.

Dashboard Lower Cover Removal/ Installation

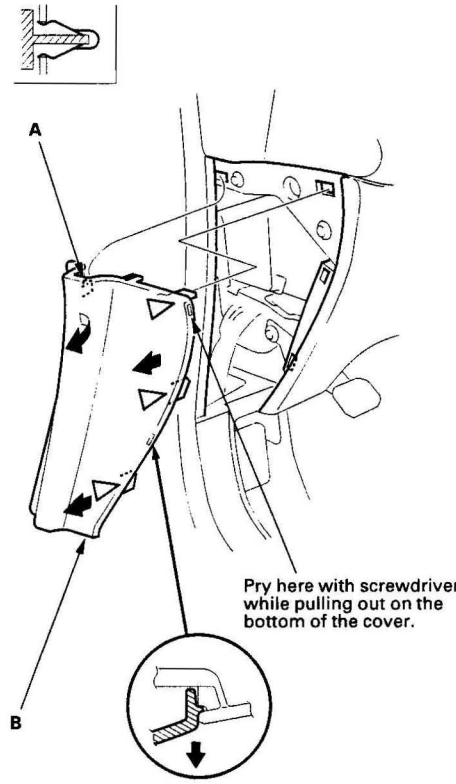
SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-17) in the SRS section before performing repairs or service.

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Take care not to scratch the dashboard and related parts.

1. Detach the clips, and release the hook (A), then remove the left dashboard side cover (B).

Fastener Locations

▷: Clip, 3



(cont'd)

Protected by AR

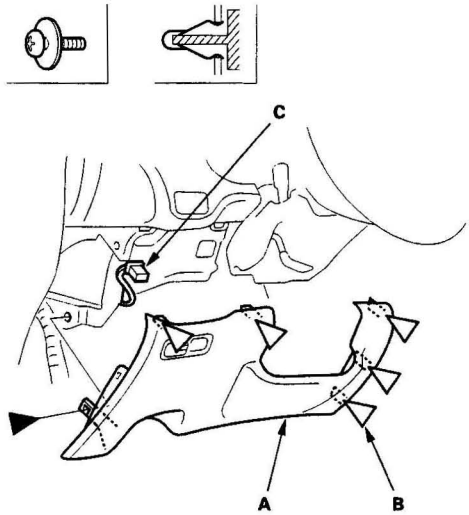
Dashboard Lower Cover Removal/ Installation (cont'd)

2. Remove the dashboard lower cover (A).

   –1 Remove the screw.
   –2 Gently pull down on the lower cover to release the right clip (B), then detach the remaining clips.
   –3 Disconnect the panel brightness controller connector (C), and remove the cover.

Fastener Locations

▶: Screw, 1 ▷: Clip, 5



3. Install the cover in the reverse order of removal, and make sure the connector is plugged in properly.

Glove Box Removal/Installation

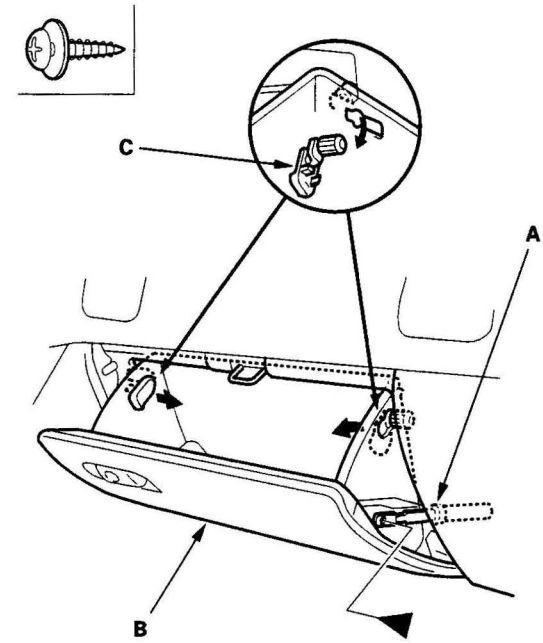
SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-17) in the SRS section before performing repairs or service.

NOTE: Take care not to scratch the dashboard and related parts.

1. Remove the screw, then remove the damper (A) from the glove box.

Fastener Location

▶: Screw, 1



2. While holding the glove box, remove the glove box stop (C) on each side.

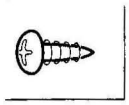
BACK

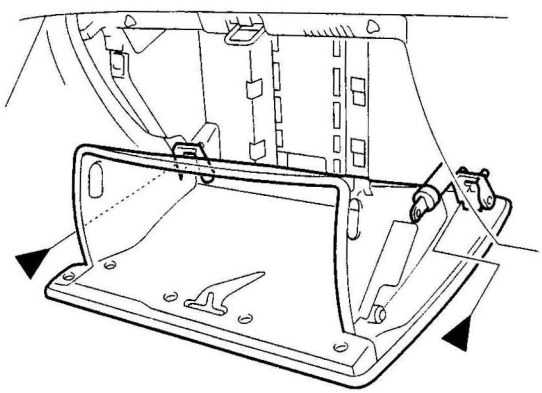
Protected by AR

3. Remove the screws, then remove the glove box.

Fastener Locations

▶ : Screw, 2



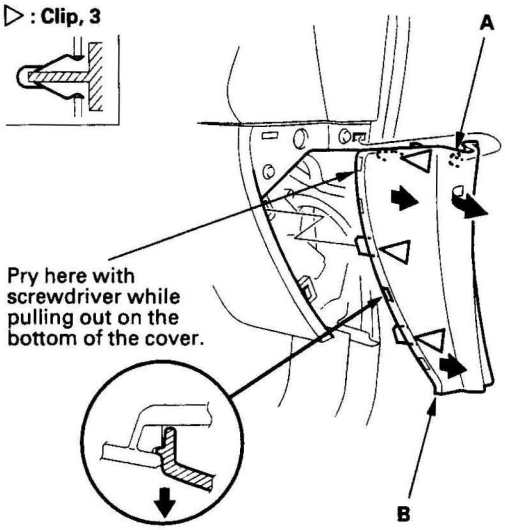


4. Remove the passenger's front console cover (see step 2 on page 20-63).

5. Detach the clips, and release the hook (A), then remove the right dashboard side cover (B).

Fastener Locations

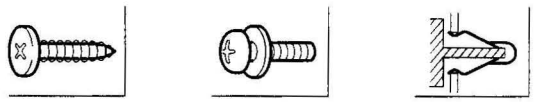
▷ : Clip, 3



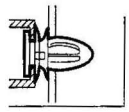
6. Remove the screws (A and B), and detach the clips (C and D). Disconnect the trunk lid opener main switch connector (E) and glove box light bulb socket (F), then remove the glove box cover (G).

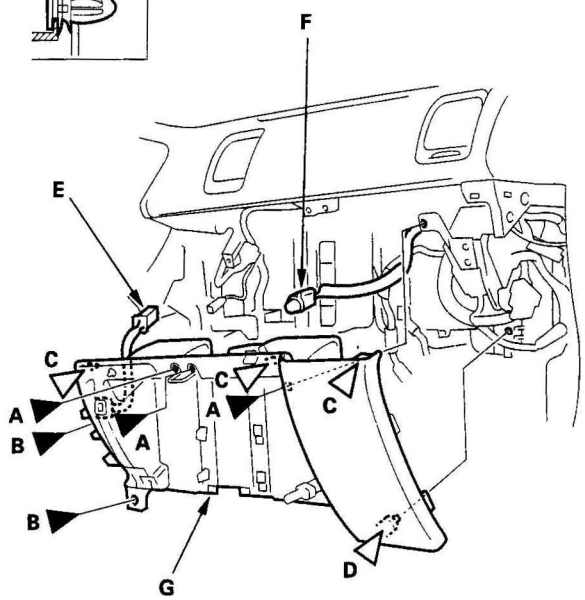
Fastener Locations

A ▶ : Screw, 3 **B ▶ : Screw, 2** **C ▷ : Clip, 3**



D ▷ : Clip, 1





7. Install the glove box in the reverse order of removal, and make sure the trunk lid opener main switch connector and glove box light bulb socket are plugged in properly.

BACK

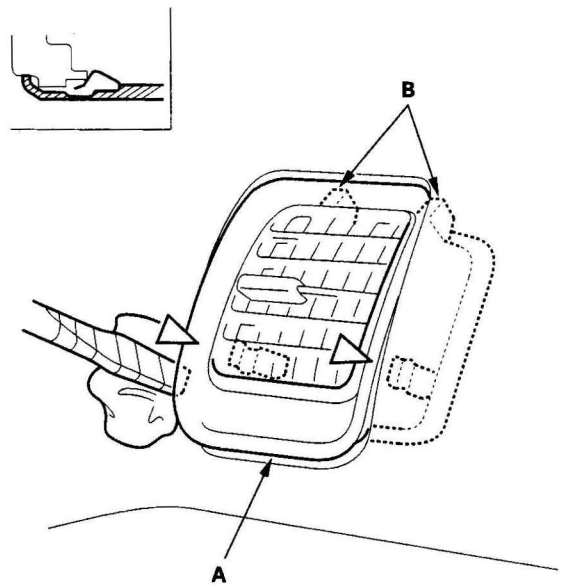
Protected by AR

Passenger's Center Vent Removal and Installation

1. Wrap a flat-tip screwdriver with protective tape, and apply protective tape around the related parts to prevent damage. Carefully insert a flat-tip screwdriver next to the clip, and detach the clips by prying on the passenger's center vent (A). Take care not to scratch the dashboard and related parts.

Fastener Locations

▷: **Clip, 2**



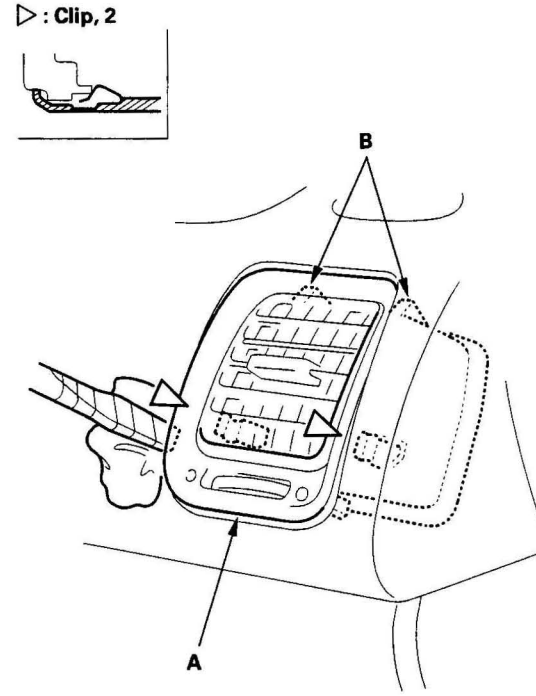
2. Remove the vent by releasing the hooks (B).
3. Reinstall the hook portions of the vent first, then push the clip portions into place securely.

Passenger's Side Vent Removal/ Installation

1. Wrap a flat-tip screwdriver with protective tape, and apply protective tape around the related parts to prevent damage. Carefully insert a flat-tip screwdriver next to the clip, and detach the clips by prying on the passenger's side vent (A). Take care not to scratch the dashboard and related parts.

Fastener Locations

▷: **Clip, 2**



2. Remove the vent by releasing the hooks (B).
3. Reinstall the hook portions of the vent first, then push the clip portions into place securely.

BACK

Protected by AR

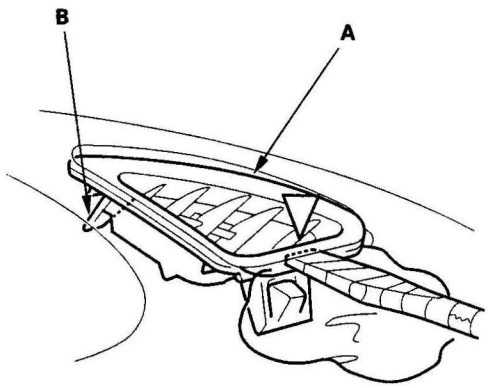
Side Defogger Vent Trim Removal and Installation

1. Wrap a flat-tip screwdriver with protective tape, and apply protective tape around the related parts to prevent damage. Carefully insert a flat-tip screwdriver next to the clip, and detach the clips by prying on the side defogger vent trim (A). Take care not to scratch the dashboard and related parts.

Fastener Location

▷: Clip, 1





2. Remove the vent trim by releasing the hook (B).

3. Reinstall the hook portion of the vent trim first, then securely push the clip into place .

Protected by AR

Dashboard Removal/Installation

SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-17) in the SRS section before performing repairs or service.

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts to prevent damage.
- An assistant is helpful when removing and installing the dashboard.
- Take care not to scratch the dashboard, body, and other related parts.
- Put on gloves to protect your hands.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.

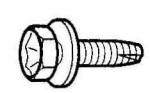
2. Disconnect the negative cable from the battery.

3. Remove these items:
   - Dashboard lower cover (see page 20-65)
   - Console panel (see page 20-63)
   - Glove box cover (see page 20-66)
   - Audio unit (see page 22-202)
   - Front pillar trim, both sides (see page 20-55)
   - Rear console (see page 20-62)

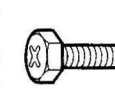
4. Remove the ground bolt (A) and mounting bolts (B). Detach the clips, and wire harness clip (D), and on ' 99-02 models, remove the data link connector (C) from the bracket. Release the tabs (E), then remove the rear vent duct (F).

Fastener Locations

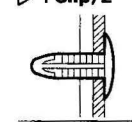
A ▶ : Bolt, 1 — **6 x 1.0 mm, 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**

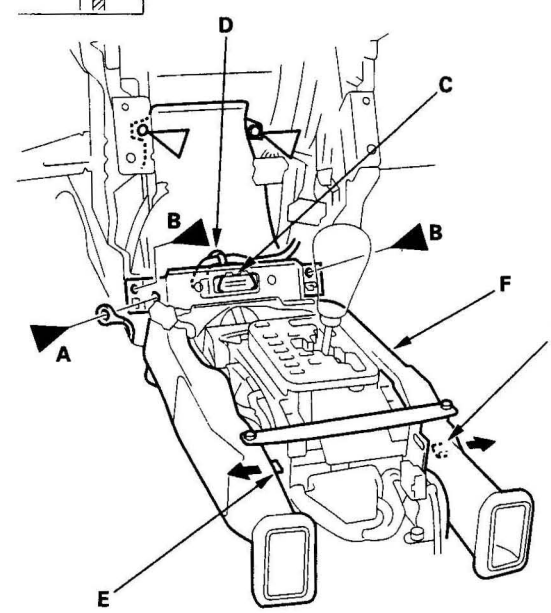


B ▶ : Bolt, 2 — **5 x 0.8 mm**



▷ : Clip, 2





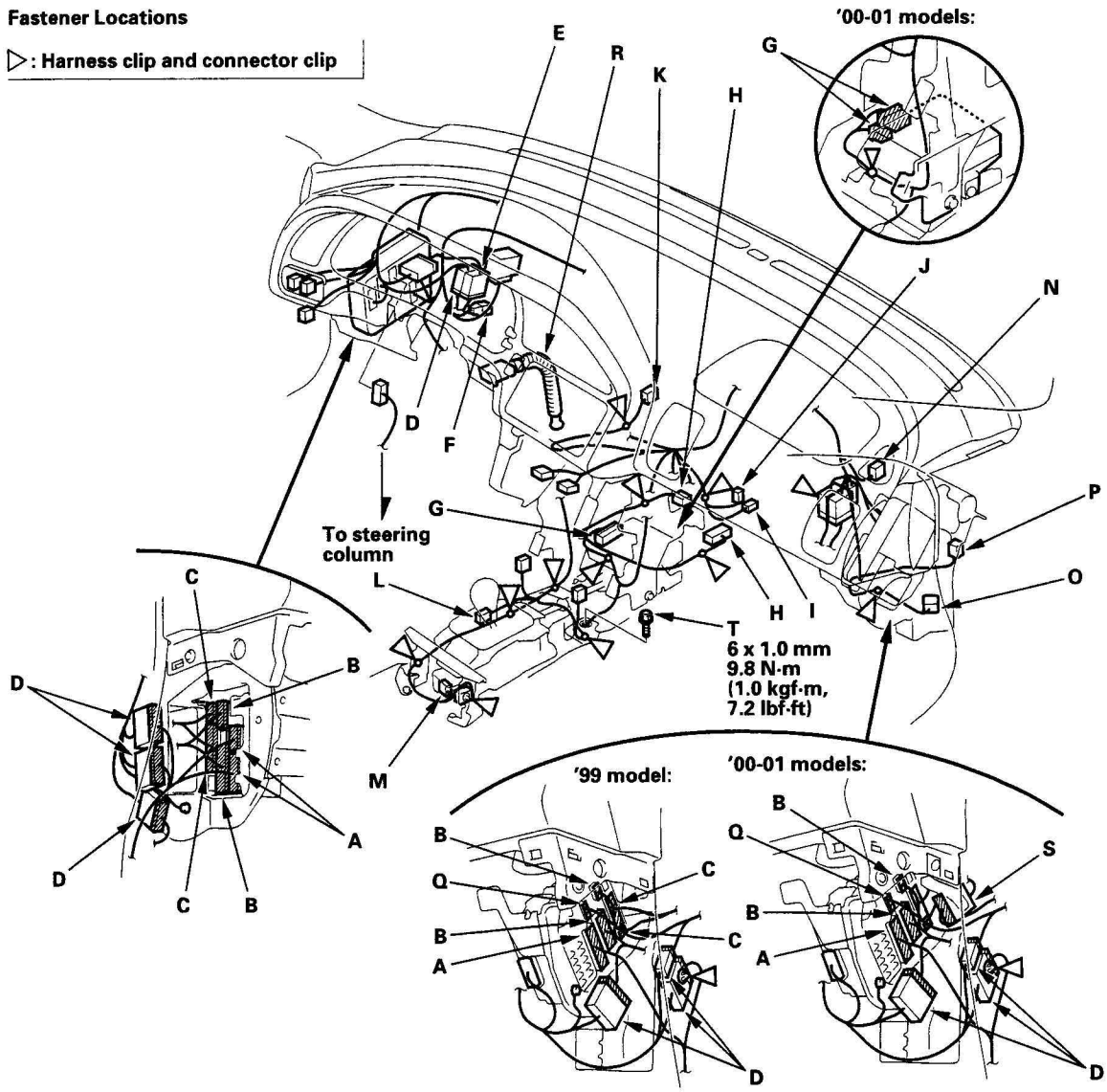
5. Disconnect the cable reel connector, immobilizer receiver unit connector, steering angle sensor connector, combination switch connectors, ignition switch connectors and driver's airbag connector, and lower the steering column (see page 17-27). To prevent damage to the steering column, wrap it with a shop towel.

BACK

Protected by AR

'99-01 models

6. Disconnect the side wire harness connectors (A), engine compartment wire harness connectors (B), door wire harness connectors (C), dashboard wire harness connectors (D), steering hanger beam wire harness connectors (E), brake switch connector (F), SRS wire harness connector(s) (G), ECM/PCM connectors (H), air mix control motor connector (I), evaporator temperature sensor connector (J), mode motor connector (K), shift lock solenoid connector (L), A/T mode switch connector (M), recirculation control motor connector (N), blower motor connector (O), power transistor connector (P), roof wire harness connectors (Q) and air hose (R). On '00-01 models, disconnect the passenger's door subharness connector (S). Using a Torx T30 bit, remove the ground bolt (T). Detach all of the harness and connector clips.



(cont'd)

Protected by AR

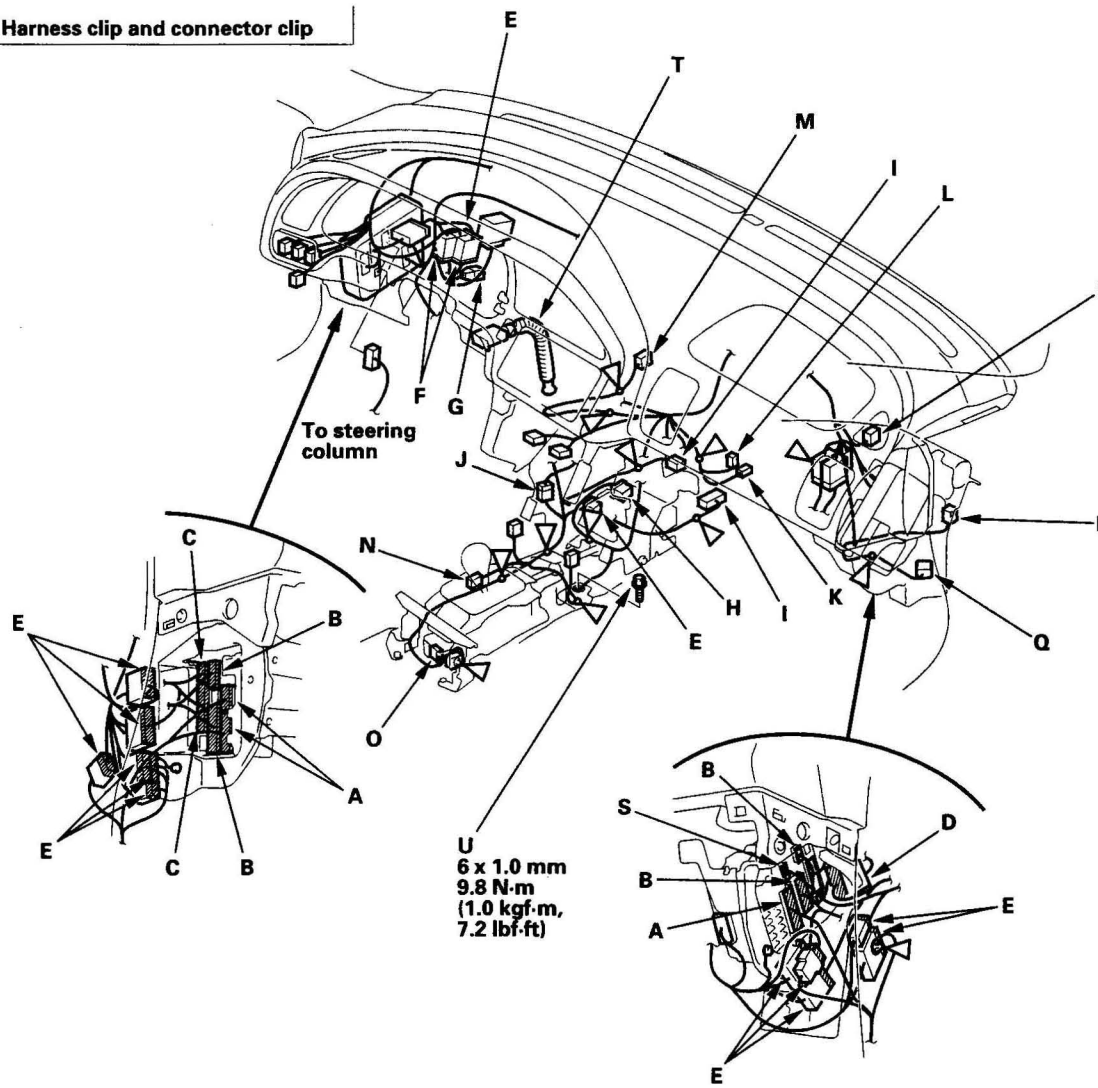
Dashboard Removal/Installation (cont'd)

'02-03 models

7. Disconnect the side wire harness connectors (A), engine compartment wire harness connectors (B), door wire harness connectors (C), passenger's door subharness connector (D), dashboard wire harness connectors (E), steering hanger beam wire harness connectors (F), brake switch connector (G), SRS wire harness connector (H), ECM/PCM connectors (I),lateral acceleration sensor connector (J) (3.2 TL-S), air mix control motor connector (K), evaporator temperature sensor connector (L), mode motor connector (M), shift lock solenoid connector (N), A/T mode switch connector (O), recirculation control motor connector (P), blower motor connector (Q), power transistor connector (R), roof wire harness connectors (S) and air hose (T).Using a Torx T30 bit, remove the ground bolt (U). Detach all of the harness and connector clips.

Fastener Locations

▷: Harness clip and connector clip



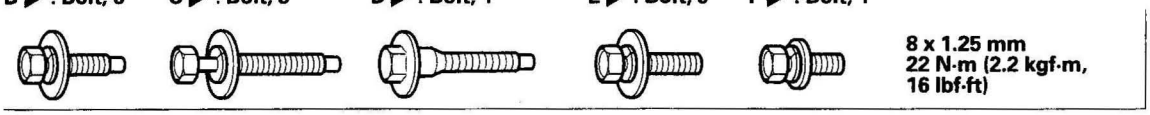
BACK

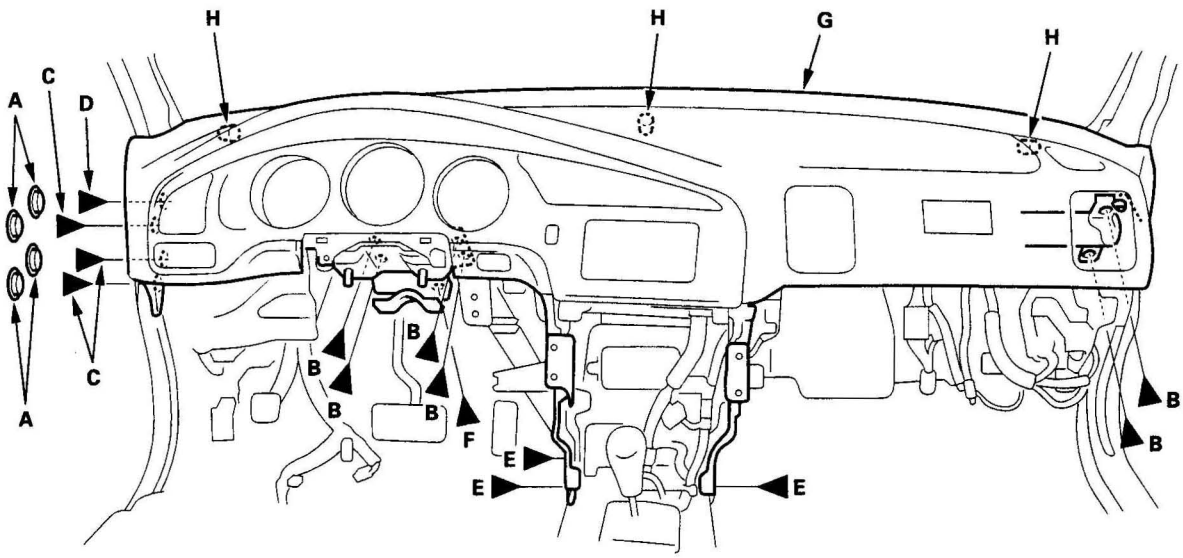
Protected by AR

8. From outside the driver's door, remove the caps (A), then remove the bolts (B, C, D, E, F), and lift up on the dashboard (G) to release it from the guide pins (H).

Fastener Locations

B ▶ : Bolt, 6 C ▶ : Bolt, 3 D ▶ : Bolt, 1 E ▶ : Bolt, 3 F ▶ : Bolt, 1





9. Carefully remove the dashboard through the front door opening.

10. Install the dashboard in the reverse order of removal, and note these items:

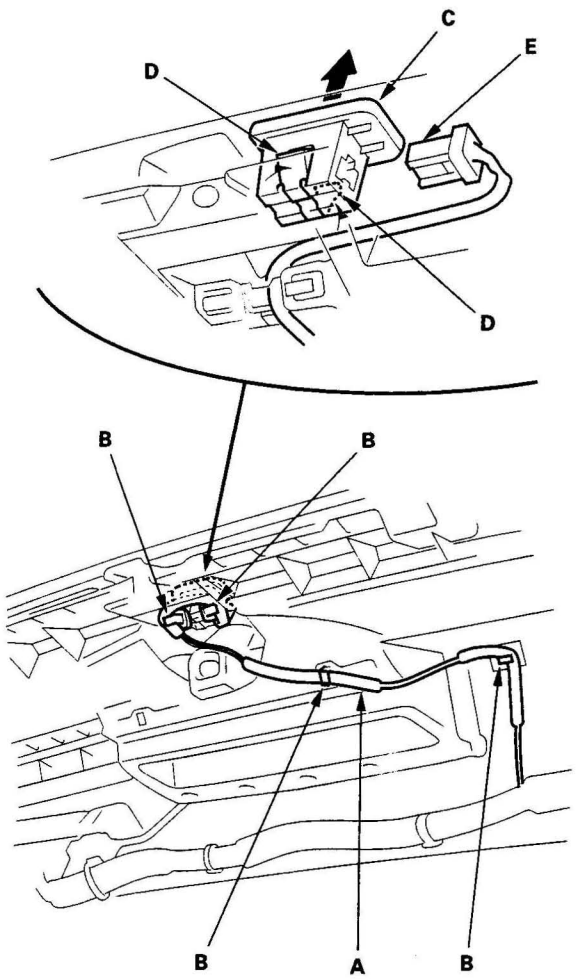
- Make sure the dashboard fits onto the guide pins correctly.
- Before tightening the bolts, make sure the dashboard wire harness and steering hanger beam wire harness are not pinched.
- Make sure the connectors are plugged in properly, and the antenna lead is connected properly.
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.
- Reset the clock.

Protected by AR

Steering Hanger Beam Replacement

NOTE: Put on gloves to protect your hands.

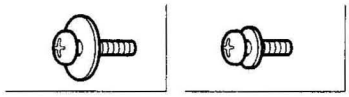
1. Remove the dashboard (see page 20-70).
2. Remove the following parts from the dashboard:
   - Instrument panel (see page 20-65)
   - Display unit (see page 22-434)
3. Release the wire harness (A) from the hooks (B). Remove the sunlight sensor (C) by detaching the clips (D), and disconnect the connector (E).

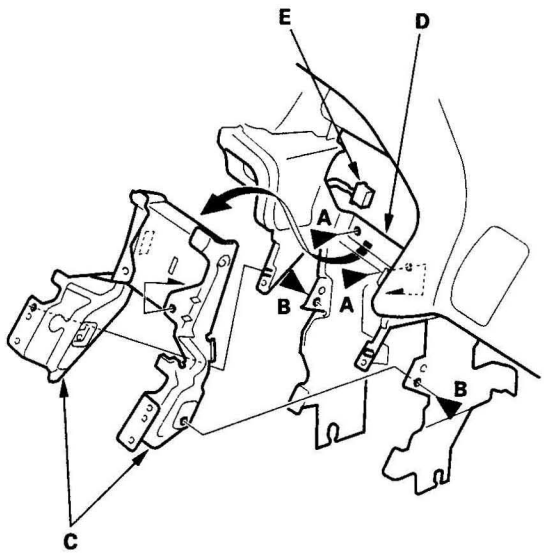


4. Remove the screws (A and B), then remove the brackets (C) from the dashboard (D). Disconnect the equalizer unit connector (E).

Fastener Locations

A ▶ : Screw, 2 **B ▶ : Screw, 2**





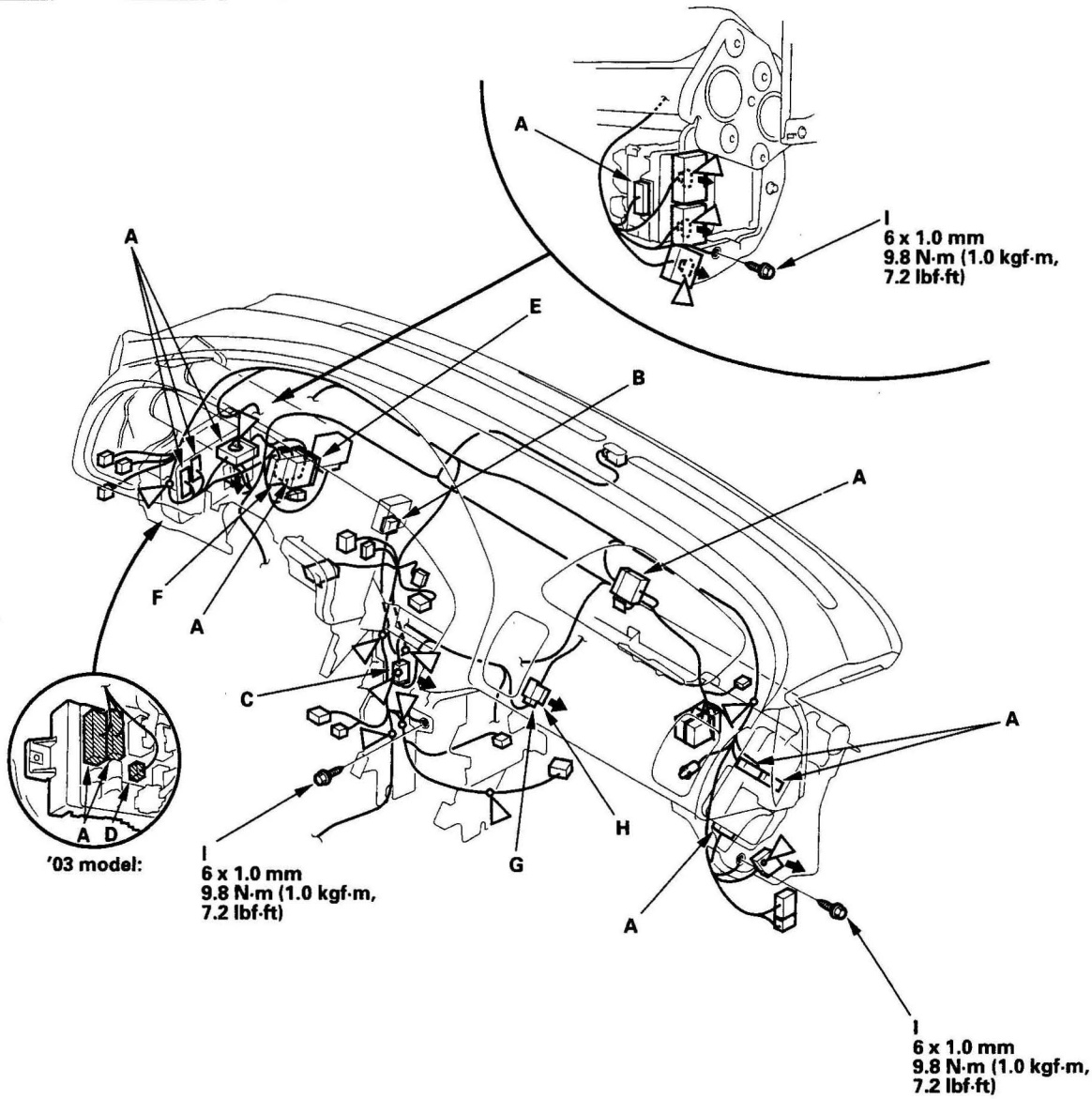
BACK

Protected by AR

5. Disconnect the dashboard wire harness connectors (A), cruise control unit connector (B), SRS wire harness connector (C). On '03 model, disconnect the memory erase signal (MES) connector (D) from the driver's under dash fuse/relay box. Detach the dashboard wire harness connector from the connector holder (E), and on '02-03 models, release it from the steering hanger beam wire harness connector (F). Release the passenger's airbag connector (G) from the connector holder (H), and disconnect the connector. Remove the ground bolts (I). Detach the harness clip and connector clips.

Fastener Locations

▷: Harness clip and connector clip



(cont'd)

Protected by AR

Steering Hanger Beam Replacement (cont'd)

6. Remove the screws and the front passenger's airbag mounting nuts from the dashboard.

Fastener Locations

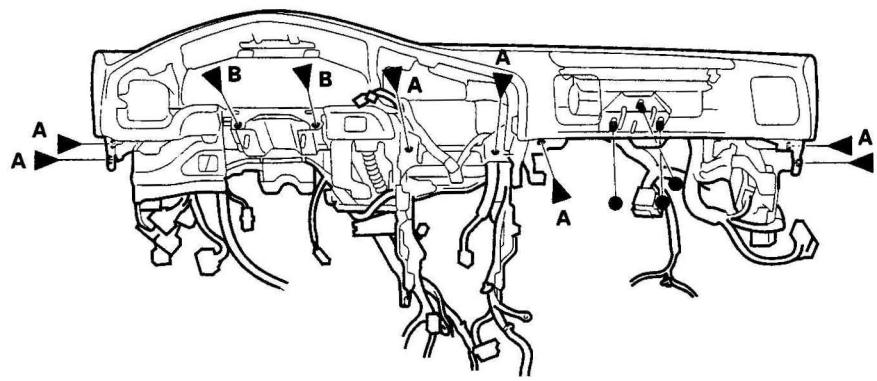
A ▶ : Screw, 7 (Gold) B ▶ : Screw, 2 (Black) ● : Nut, 3



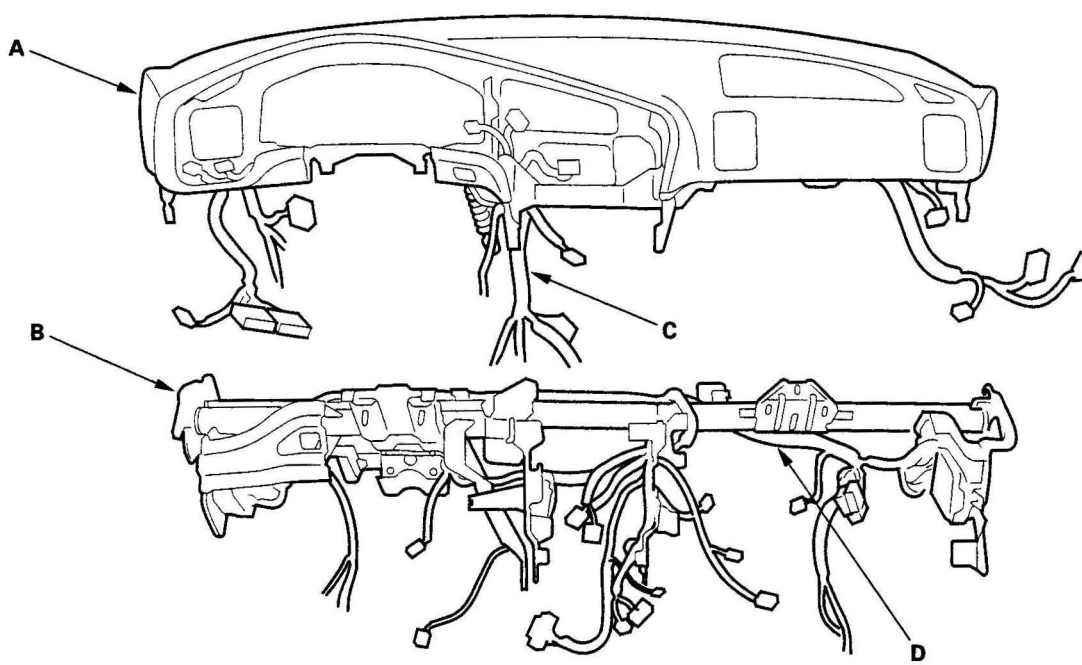




6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



7. Separate the dashboard (A) and steering hanger beam (B).



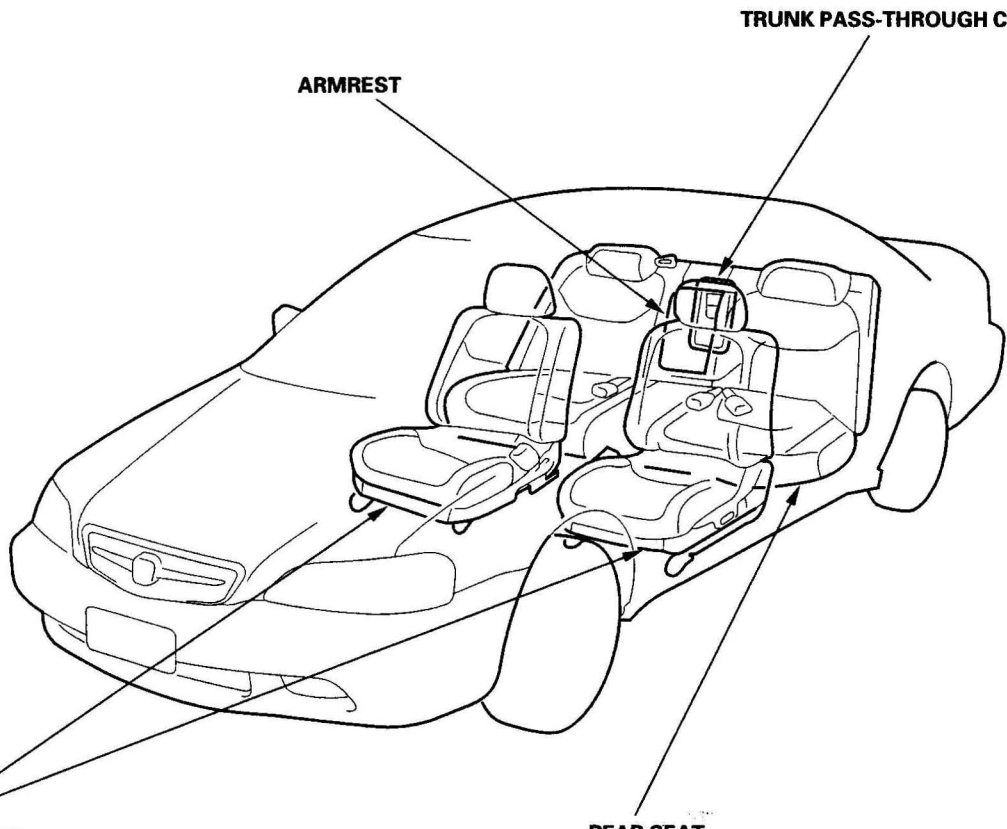
8. Install the beam in the reverse order of removal, and note these items:

- Make sure the dashboard wire harness (C) and steering hanger beam wire harness (D) are not pinched.
- Make sure the connectors are connected properly.

BACK

Protected by AR

Component Location Index



FRONT SEATS
Removal/Installation, page 20-78
Disassembly/Reassembly-4-Way Power, page 20-80
Disassembly/Reassembly-8-Way Power, page 20-82
Seat Wire Harness Installation, page 20-84
Seat Linkage Disassembly/Reassembly-4-Way Power, page 20-88
Seat Linkage Disassembly/Reassembly-8-Way Power, page 20-89
Seat Cover Replacement, page 20-90

REAR SEAT
Removal/Installation, page 20-95
Armrest Replacement, page 20-96
Trunk Pass-through Cover Key Cylinder Replacement, page 20-97
Seat-back Cover Replacement, page 20-98
Seat Cushion Cover Replacement, page 20-99

Protected by AR

Front Seat Removal/Installation

'00-03 models: SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-17) in the SRS section before performing repairs or service.

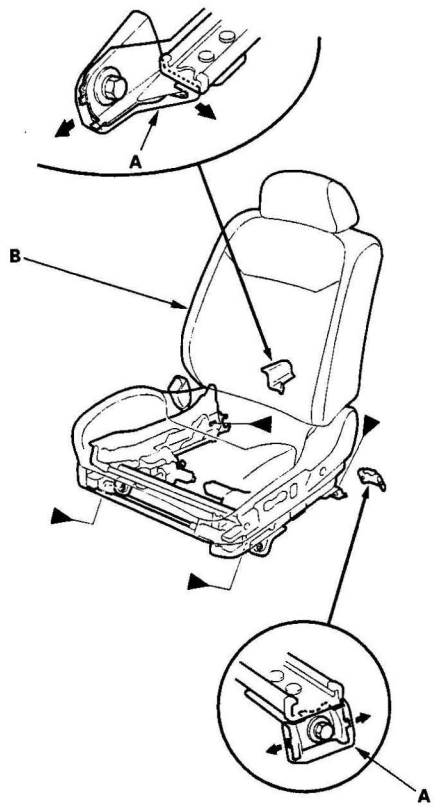
1. '00-03 models: Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio preset buttons. Disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.

2. Remove the seat track end covers (A), and remove the bolts securing the front seat (B). When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage. Take care not to scratch the body or tear the seat covers.

Fastener Locations
▶ : Bolt, 4

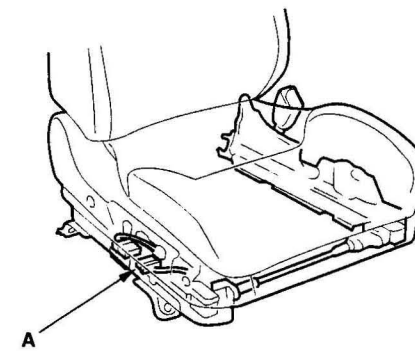


10 x 1.25 mm
34 N·m
(3.5 kgf·m,
25 lbf·ft)

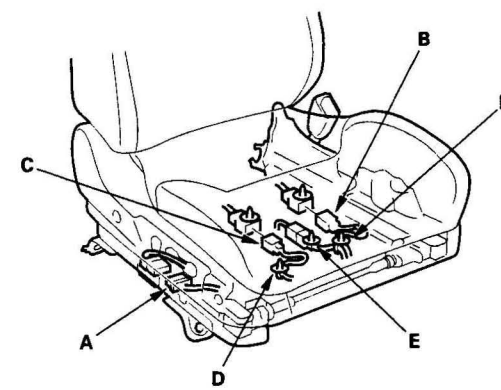


3. Lift up the front seat, then disconnect the seat harness connector (A). On '00-01 models, disconnect the side airbag connector (B). And on the '00-01 models passenger's seat only, disconnect the OPDS unit connector (C), and detach the harness clips (D) and connector clip (E).

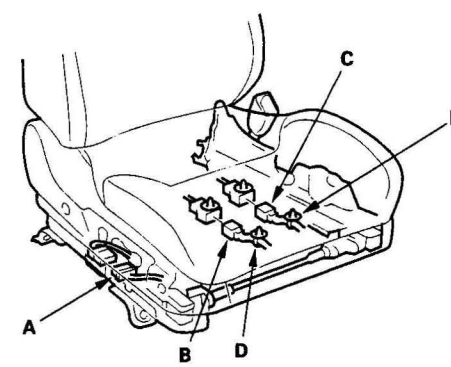
'99 model 4-way power seat (passenger's):



'00 model 4-way power seat (passenger's):



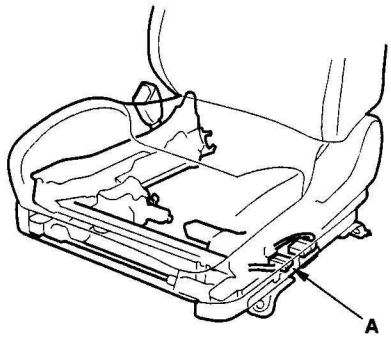
'01-03 models 4-way power seat (passenger's):



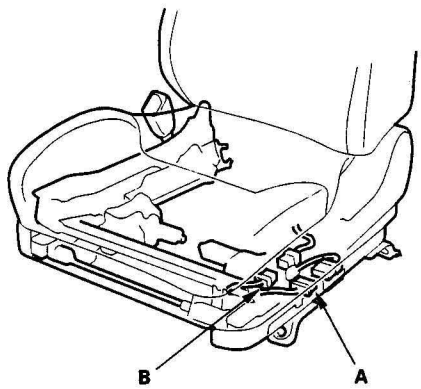
BACK

Protected by AR

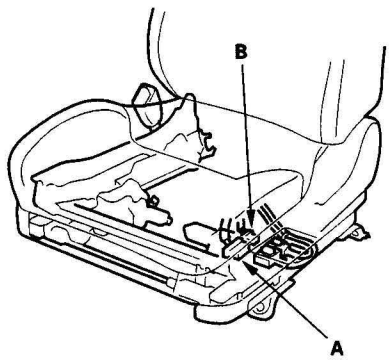
'99 model 8-way power seat (driver's):



'00 model 8-way power seat (driver's):



'01-03 models 8-way power seat (driver's):



4. With the help of an assistant, carefully remove the front seat through the front door opening.

5. Install the seat in the reverse order of removal, and note these items:

   - Make sure the seat harness connector is connected properly.
   - '00-03 models: Enter the anti-theft code for the radio, then enter the customer's radio station presets.
   - '00-03 models: Reset the clock.

Protected by AR

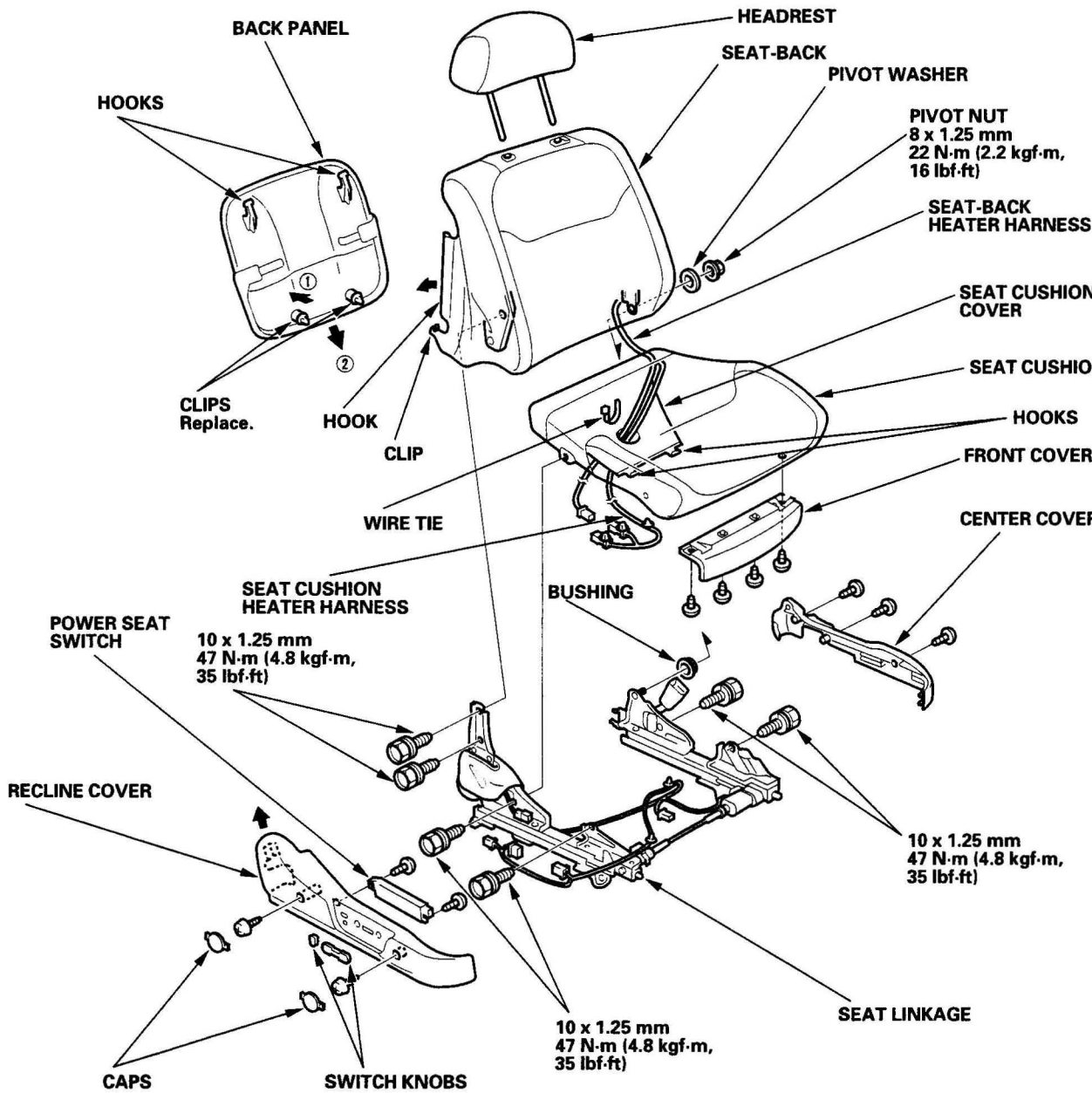
Front Seat Disassembly/Reassembly - 4-Way Power

'99 Model

1. Disassemble the front seat as shown.

2. Reassemble the seat in the reverse order of disassembly, and note these items:

   - Route the seat wire harness correctly (see page 20-84).
   - Make sure the bushing and pivot washer are installed correctly.
   - Apply multipurpose grease to the moving portion of the seat track.
   - To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.



BACK

Protected by AR

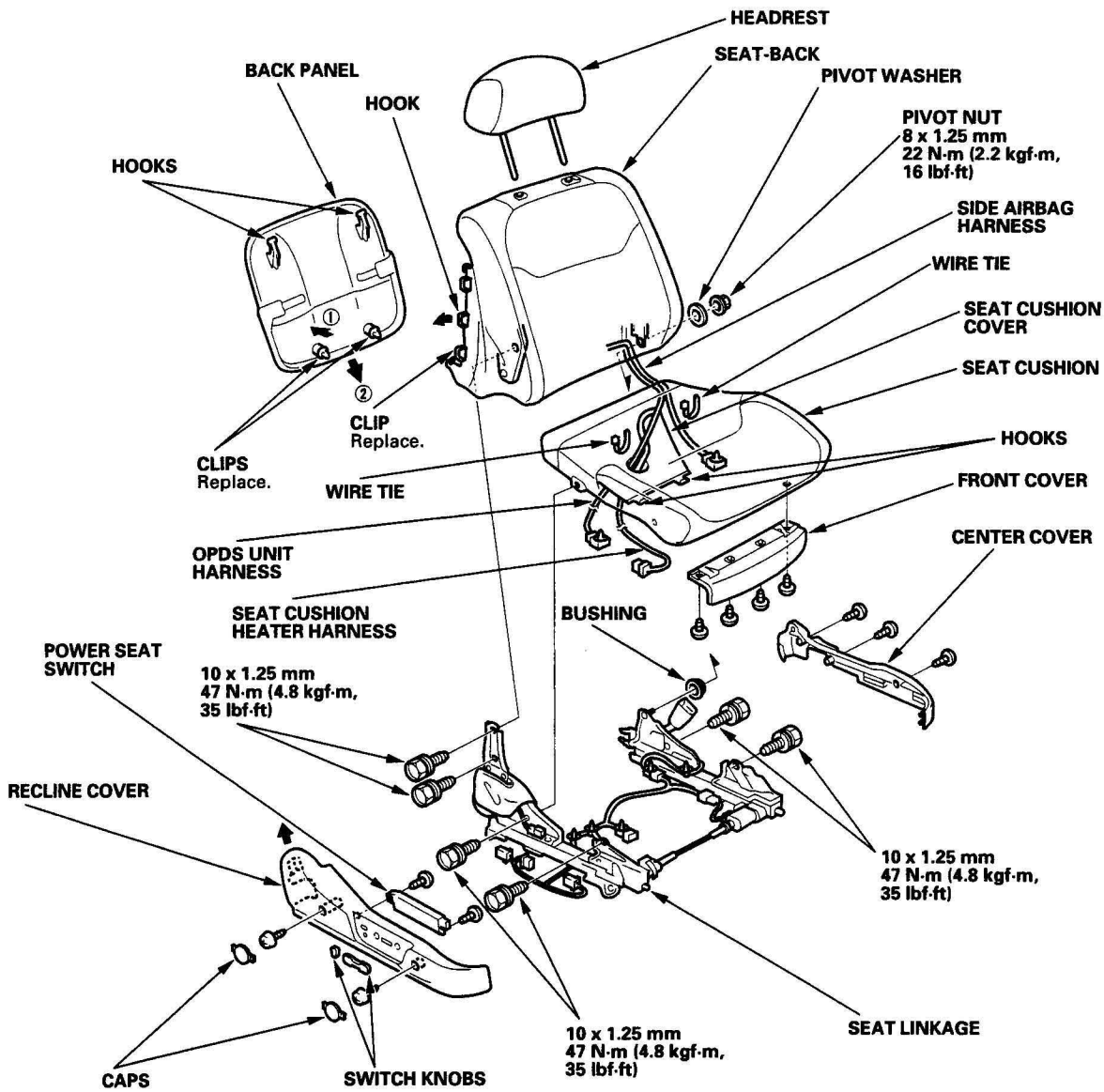
'00-03 Models

SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions, and procedures (see page 23-17) in the SRS section before performing repairs or service.

1. Disassemble the front seat as shown.

2. Reassemble the seat in the reverse order of disassembly, and note these items:

   - Route the seat wire harness correctly, '00 model (see page 20-85), '01 model (see page 20-86), '02-03 models (see page 20-87).
   - Make sure the bushing and pivot washer are installed correctly.
   - Apply multipurpose grease to the moving portion of the seat track.
   - To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.



BACK

Protected by AR

Front Seat Disassembly/Reassembly - 8-Way Power

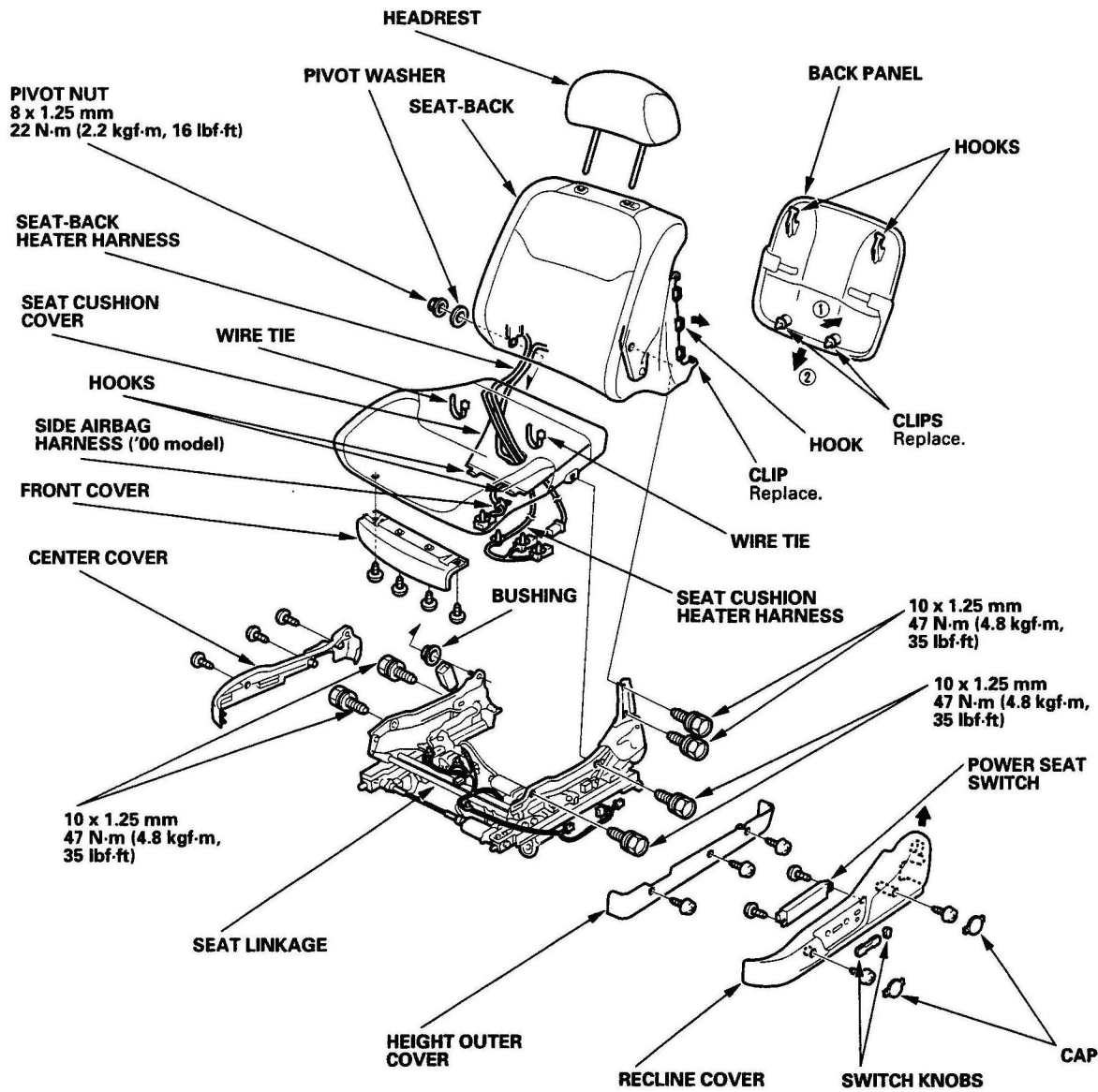
'99-01 Models

'00-01 models: SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-17) in the SRS section before performing repairs or service.

1. Disassemble the front seat as shown.

2. Reassemble the seat in the reverse order of disassembly, and note these items:

   - Route the seat wire harness correctly, '99 model (see page 20-84), '00 model (see page 20-85), '01 model (see page 20-86).
   - Make sure the bushing and pivot washer are installed correctly.
   - Apply multipurpose grease to the moving portion of the seat track.
   - To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.



BACK

Protected by AR

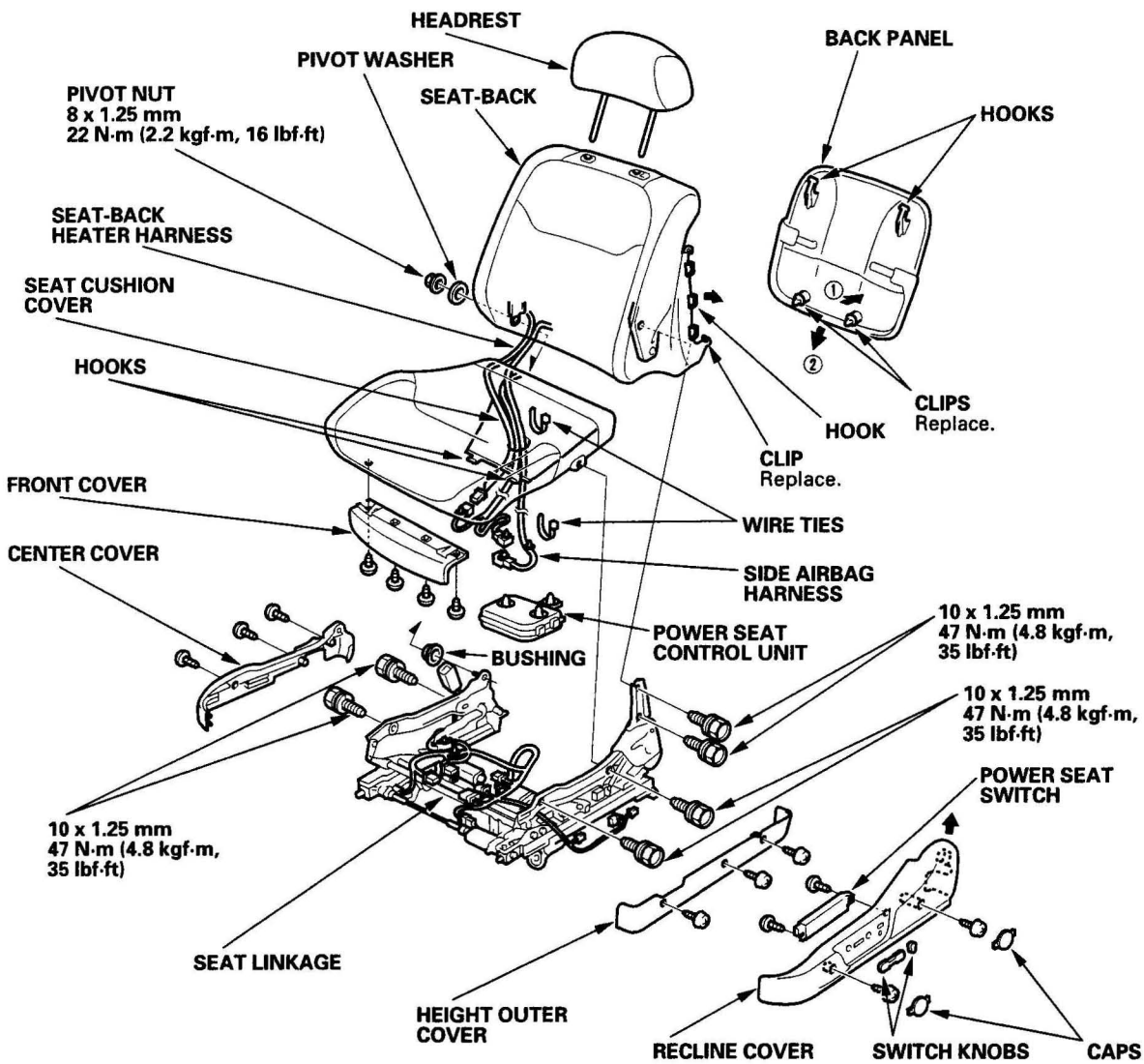
'02-03 Models

SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions, and procedures (see page 23-17) in the SRS section before performing repairs or service.

1. Disassemble the front seat as shown. The driver's seat for the 3.2 TL is shown, the 3.2 TL-S is similar.

2. Reassemble the seat in the reverse order of disassembly, and note these items:

   - Route the seat wire harness correctly (see page 20-87).
   - Make sure the bushing and pivot washer are installed correctly.
   - Apply multipurpose grease to the moving portion of the seat track.
   - To prevent wrinkles in the seat-back cover, stretch the material evenly over the pad.



BACK

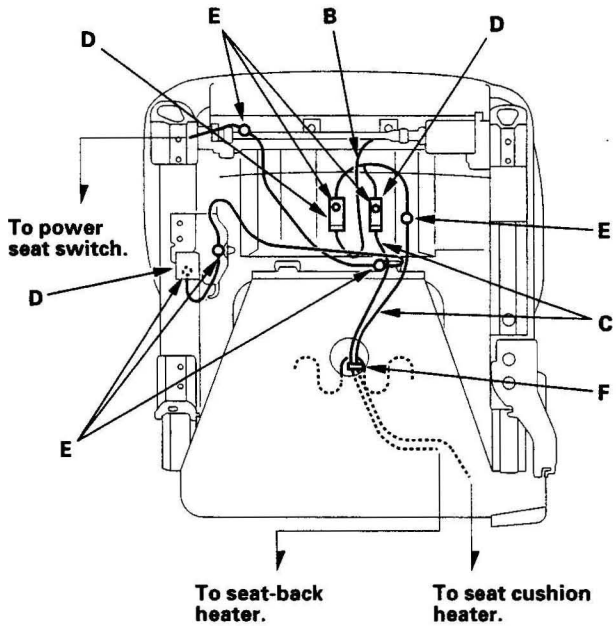
Protected by AR

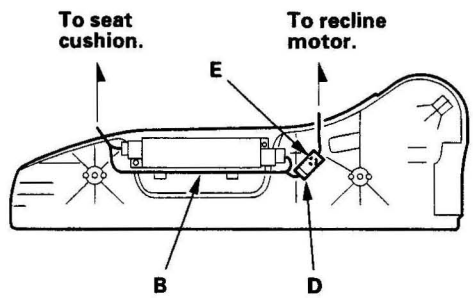
Front Seat Wire Harness Installation

'99 Model

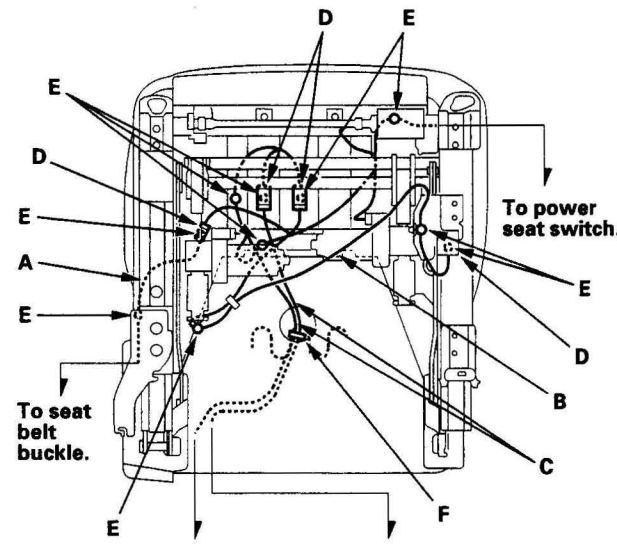
When assembling the seat cushion, make sure the seat belt switch harness (A), seat harness (B), seat heater harnesses (C), connectors (D), clips (E) and wire tie (F) are fastened correctly.

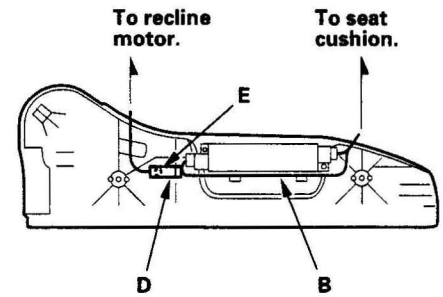
4-way power seat (with seat heater):





8-way power seat (with seat heater):





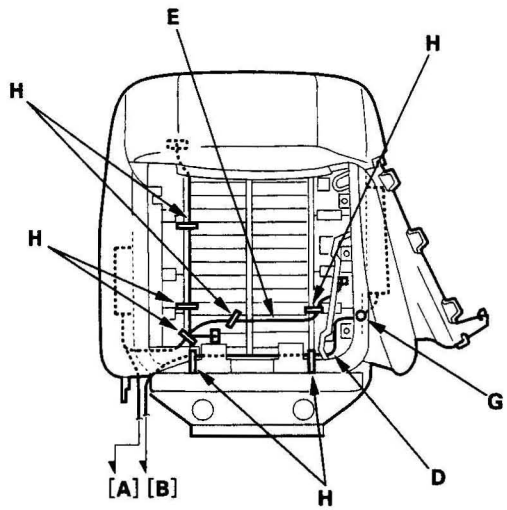
BACK

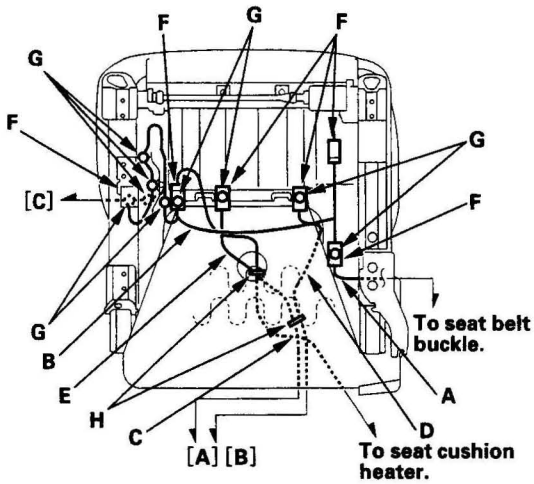
Protected by AR

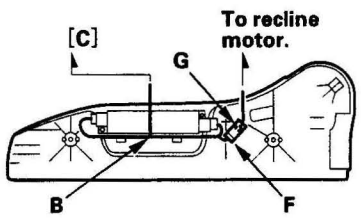
'00 Model

When assembling the front seat, make sure the seat belt switch harness (A), seat harness (B), seat heater harnesses (C), side airbag harness (D), OPDS unit harness (E), connectors (F), clips (G) and wire tie (H) are fastened correctly.

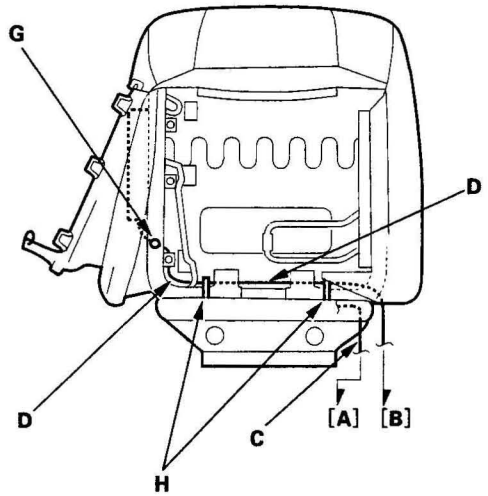
4-way power seat:

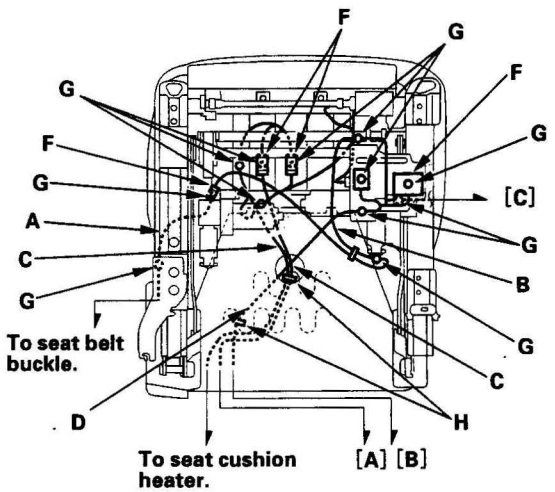


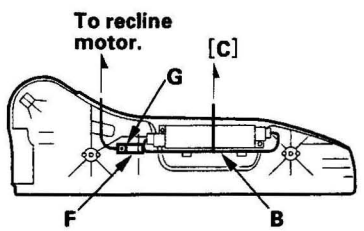




8-way power seat:







BACK

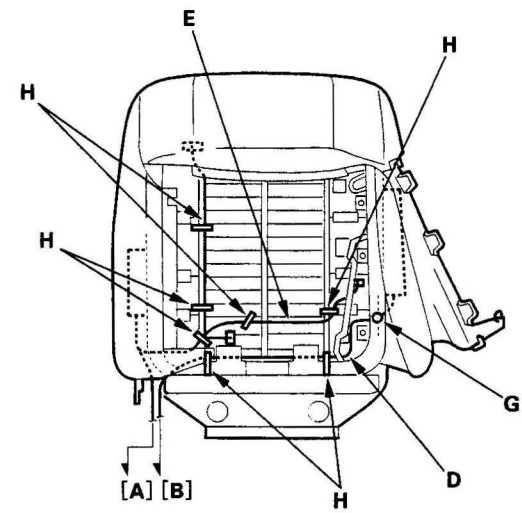
Protected by AR

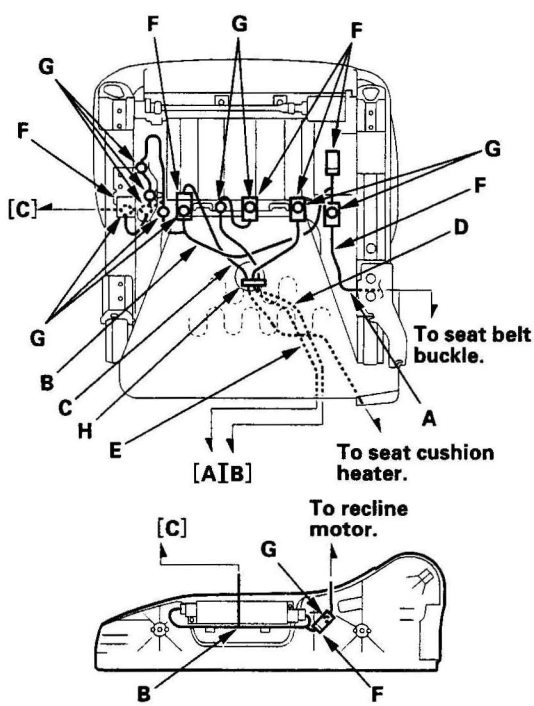
Front Seat Wire Harness Installation (cont'd)

'01 Model

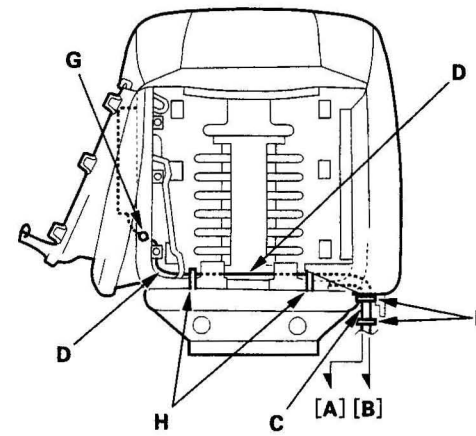
When assembling the seat cushion, make sure the seat belt switch harness (A), seat harness (B), seat heater harnesses (C), side airbag harness (D), OPDS unit harness (E), connectors (F), clips (G) and wire tie (H) are fastened correctly.

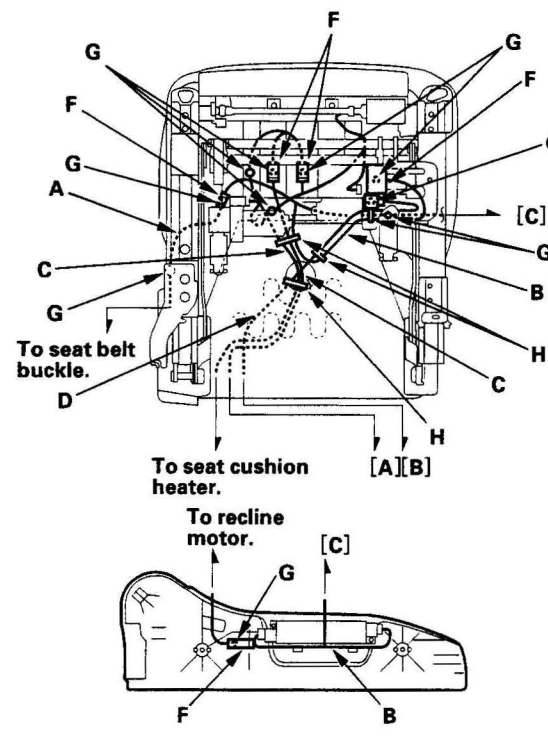
4-way power seat (with seat heater):





8-way power seat (with driving position memory and seat heater):





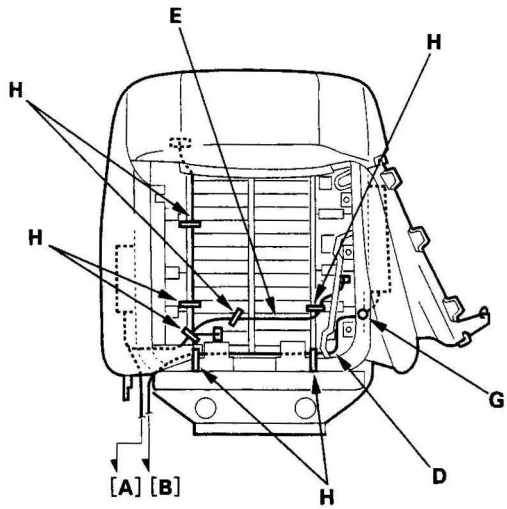
BACK

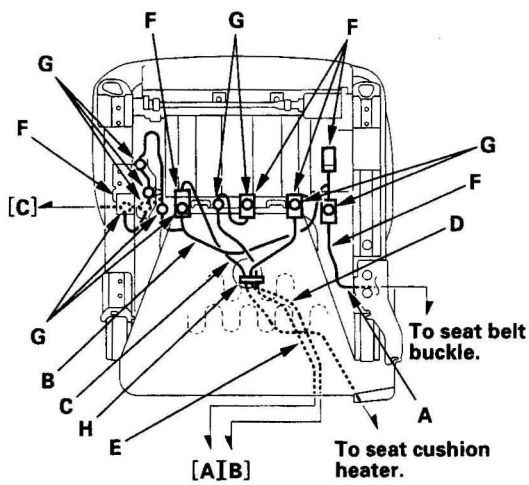
Protected by AR

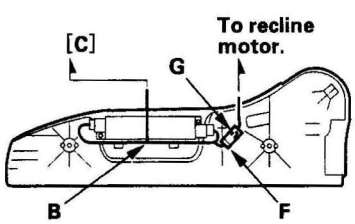
'02-03 Models

When assembling the seat cushion, make sure the seat belt switch harness (A), seat harness (B), seat heater harnesses (C), side airbag harness (D), OPDS unit harness (E), connectors (F), clips (G) and wire tie (H) are fastened correctly.

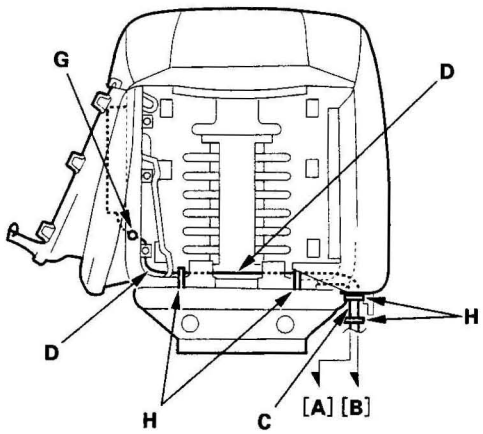
4-way power seat (with seat heater):

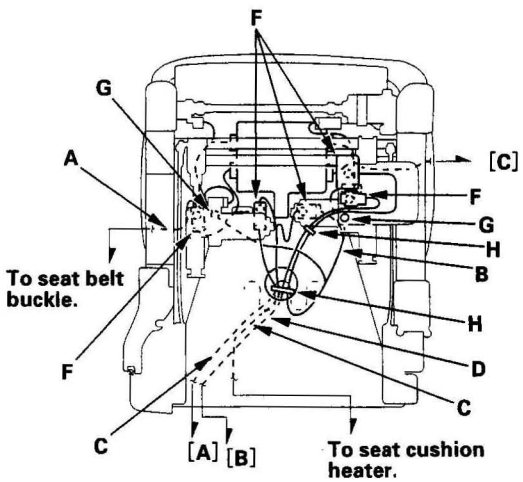


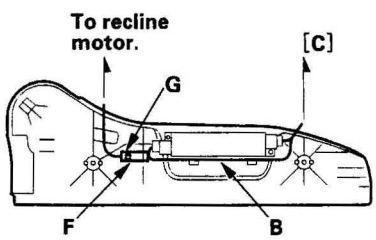




8-way power seat (with driving position memory and seat heater):







BACK

Protected by AR

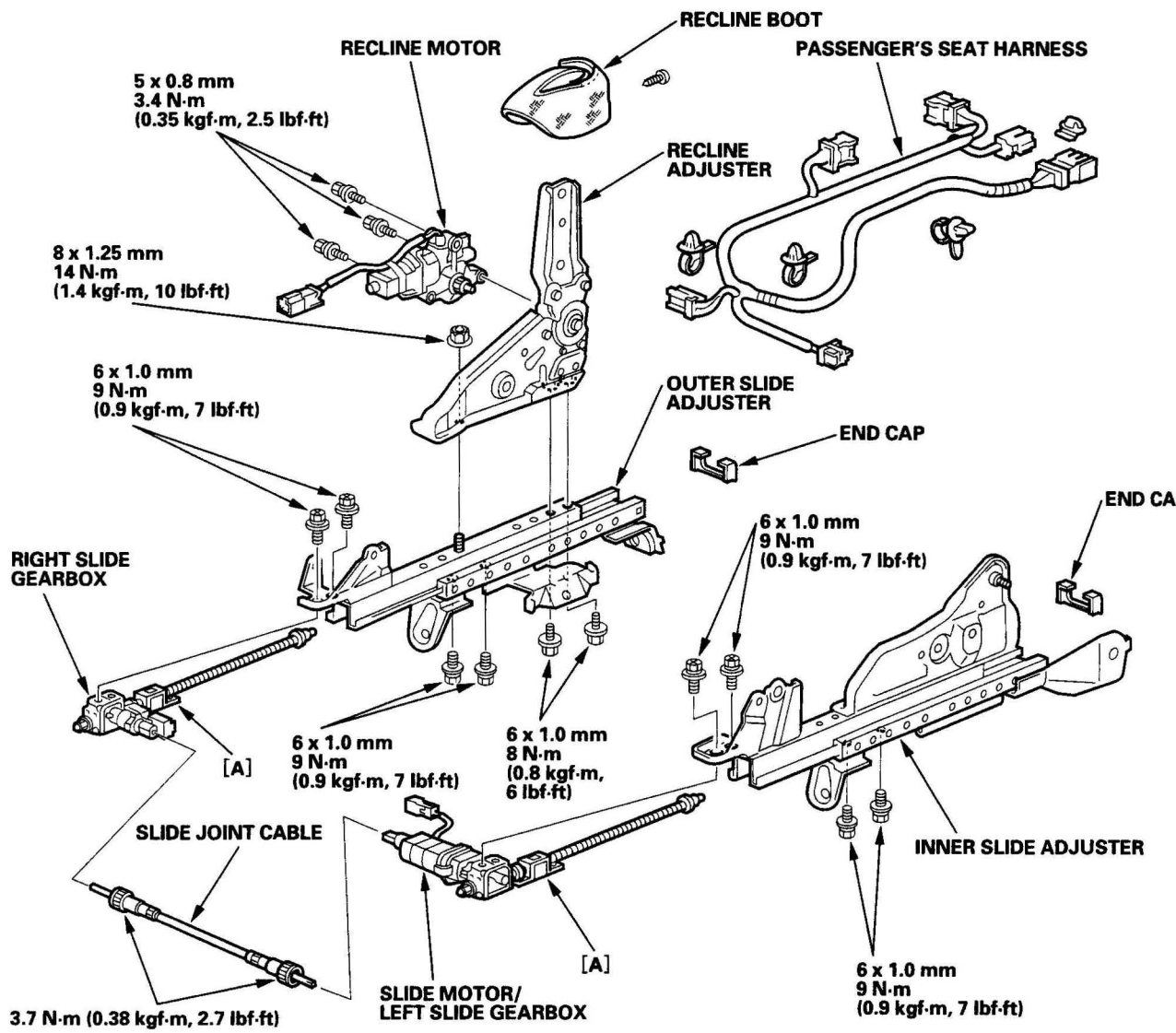
Front Seat Linkage Disassembly/Reassembly - 4-Way Power

NOTE:
- Put on gloves to protect your hands.
- To remove the slide motor and slide gearbox, slide the front seat backward fully.

1. Disassemble the linkage as shown.

2. Reassemble in the reverse order of disassembly, and note these items:

   - Before installing the slide motor and slide gearbox, align portion (A) as shown to align both slide gearbox positions.
   - Apply multipurpose grease to the sliding and pivot portions of the linkage.
   - Check operation of the recline and slide adjusters.



BACK

Protected by AR

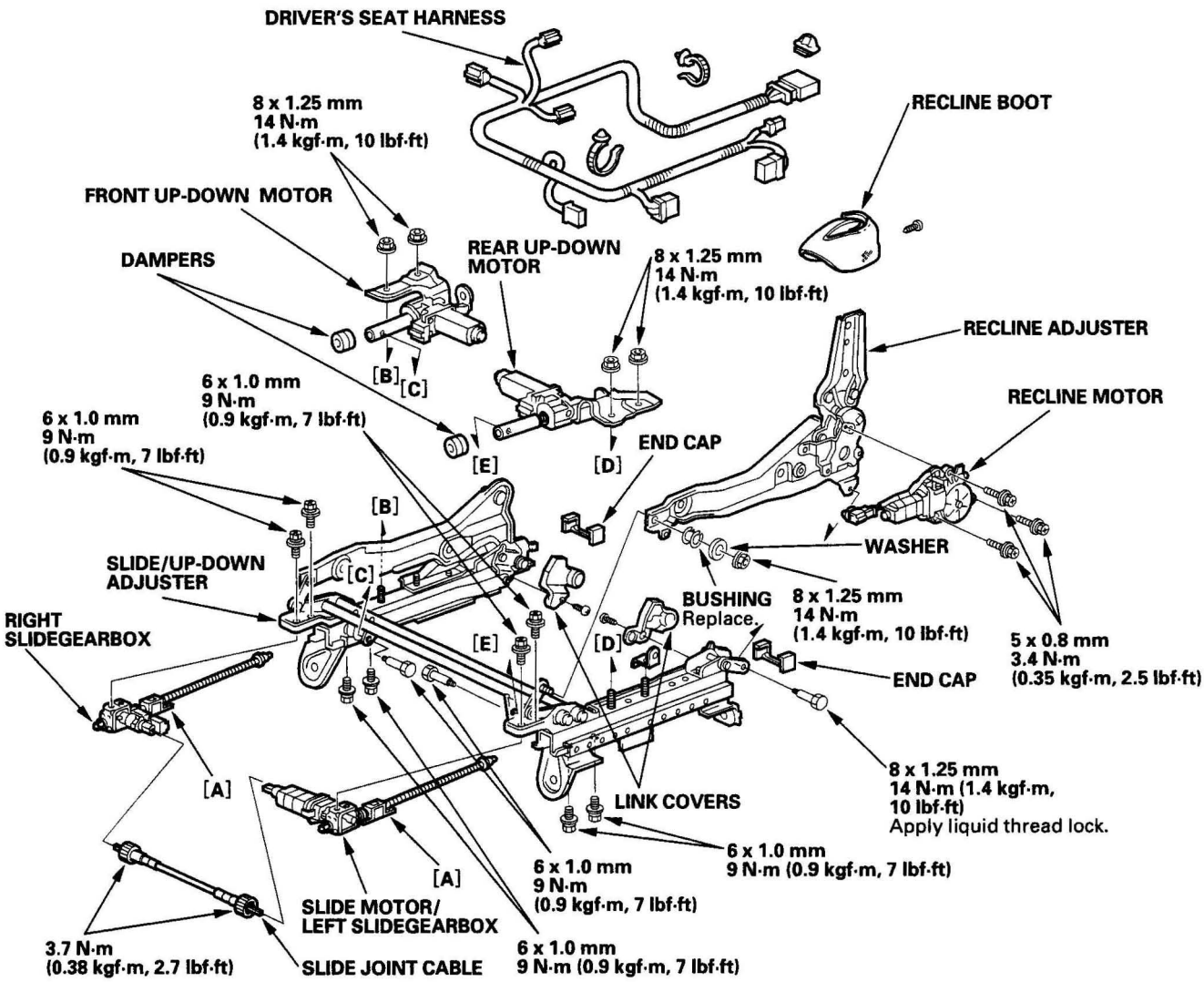
Front Seat Linkage Disassembly/Reassembly - 8-Way Power

NOTE:
- Put on gloves to protect your hands.
- Before removing the front seat, raise the seat cushion to its maximum height.
- To remove the slide motor and slide gearbox, slide the front seat backward fully.

1. Disassemble the linkage as shown.

2. Reassemble the linkage in the reverse order of disassembly, and note these items:

   - Replace the bushing with new ones.
   - Before installing the slide motor and slidegearbox, align portion (A) as shown to align both slidegearbox positions.
   - Apply multipurpose grease to the sliding and pivot portions.
   - Check operation of the recline adjuster and slide/up-down adjusters.



BACK

Protected by AR

Front Seat Cover Replacement

'00-03 models: SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-17) in the SRS section before performing repairs or service.

NOTE:
- '00-03 models: Seats with airbags are marked "SIDE AIRBAG" on the seat-back. Because the component parts (seat-back cover, cushion, etc.) of seats with and without airbags are different, make sure you install only the correct replacement parts.
- '00-03 models: Do not repair torn or frayed seat-back covers. If necessary, replace the seat-back cover.
- Take care not to tear the seams or damage the seat covers.
- '00-03 models: Do not touch the OPDS sensor in the seat-back pad and keep it away from oils. Oils can corrode the sensor causing it to fail.
- Put on gloves to protect your hands.

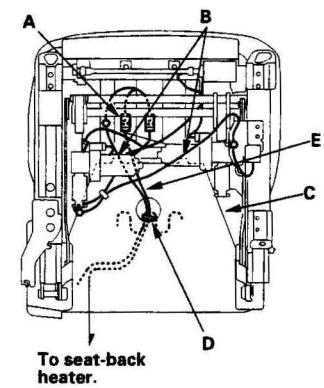
Seat-back Cover

1. Remove the front seat (see page 20-78).

2. '99 model: Remove the seat-back heater harness from the seat cushion.

   –1 Disconnect the seat-back heater connector (A).
   –2 Release the hooks (B), and pull back the seat cushion cover (C).
   –3 Release the wire tie (D).
   –4 Pull out the harness (E).

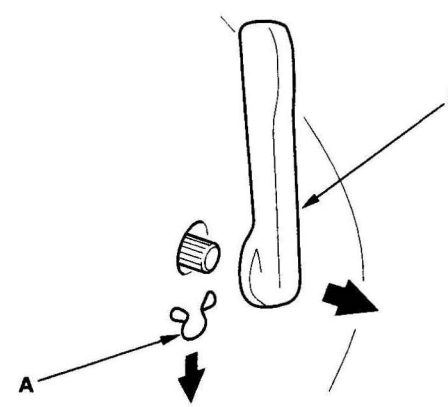
   Driver's seat (the passenger's seat is similar):



3. Fold the seat-back forward.

4. Remove the back panel, 4-way power seat on '99 model (see page 20-80), 4-way power seat on '00-03 models (see page 20-81), 8-way power seat on '99-01 models (see page 20-82), 8-way power seat on '02-03 models (see page 20-83).

5. Driver's seat: Remove the clip (A), then remove the lumbar support knob (B).

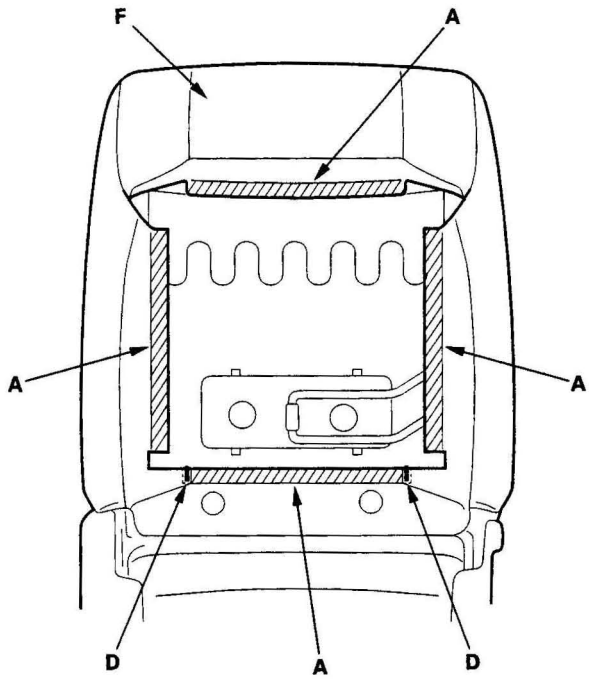


BACK

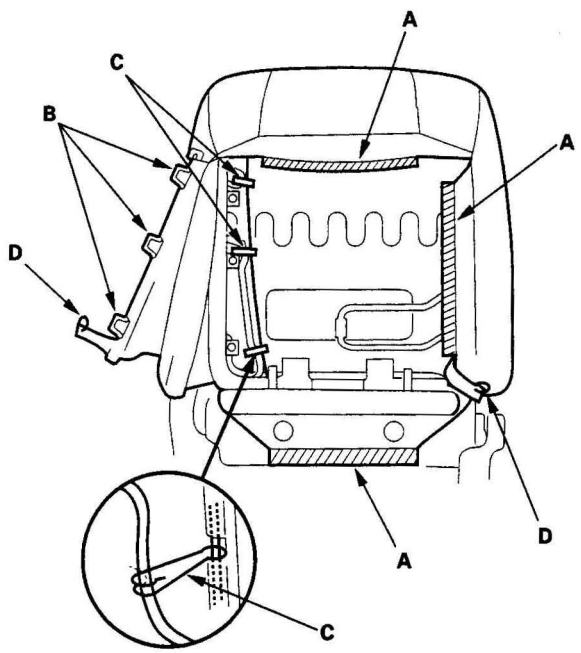
Protected by AR

6. Release the hooks (A, B, C), clips (D), and springs (E) (3.2 TL-S), then loosen the seat-back cover (F).

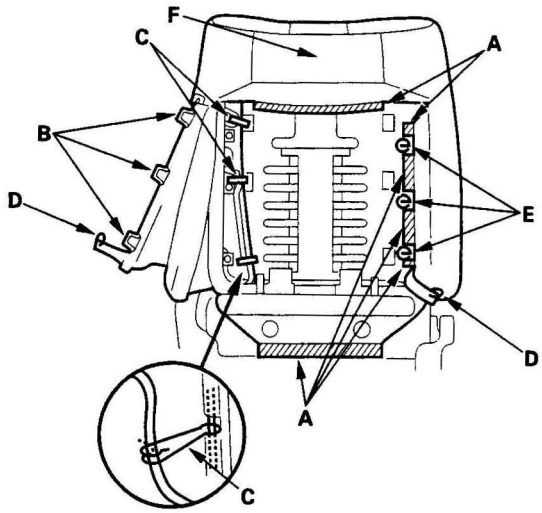
3.2 TL ('99 model):



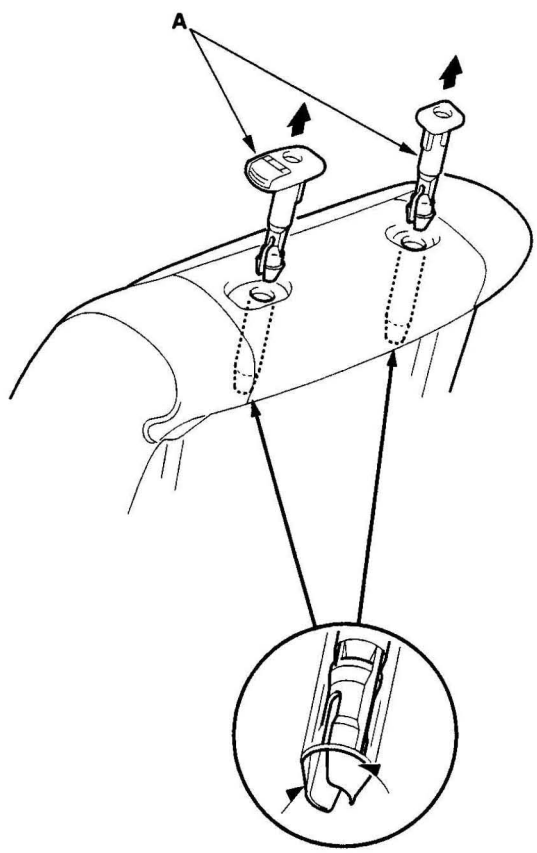
3.2 TL ('00-03 models):



3.2TL-S:



7. Pull out the headrest guides (A) while pinching the end of the guides, and remove them.



(cont'd)

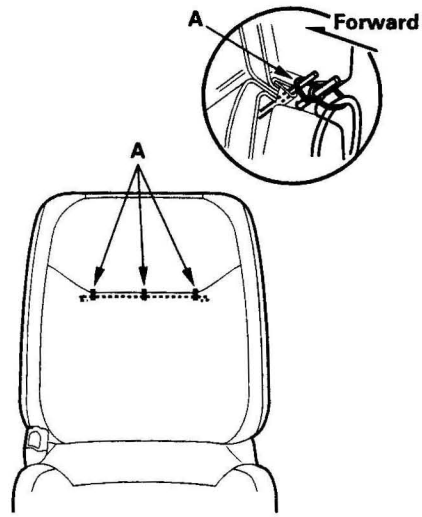
BACK

Protected by AR

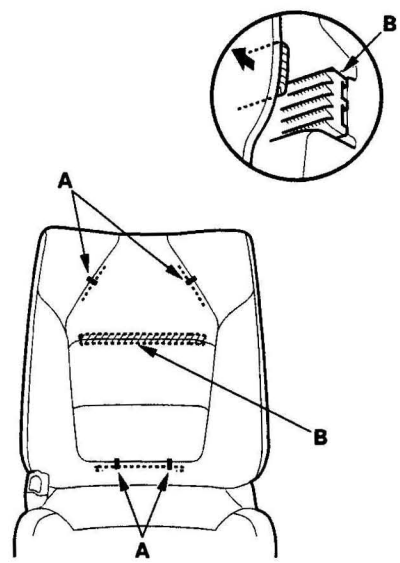
Front Seat Cover Replacement (cont'd)

8. Pull back the edge of the seat-back cover all the way around, and release the clips (A) and fastener (B) (3.2TL-S), then remove the seat-back cover.

3.2TL:



3.2TL-S:



9. Install the cover in the reverse order of removal, and note these items:

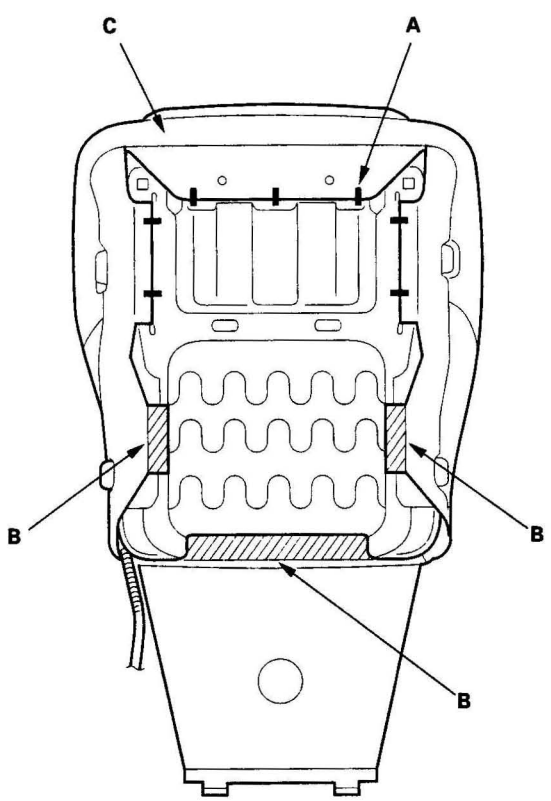
- To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hooks and clips.
- '99 model: Make sure the seat heater connector is connected properly, and the seat heater harness is routed properly.
- Replace any clips you removed with new ones. Install them with commercially available upholstery ring pliers.
- Use only original Acura replacement seat-back covers ('00-03 models).
- '00-03 models: Reinitialize the OPDS control unit (see page 23-33).

BACK

Protected by AR

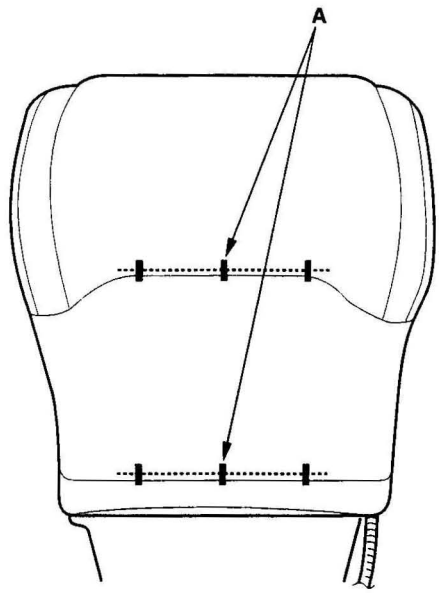
Seat Cushion Cover

1. Remove the front seat (see page 20-78).
2. Remove the seat cushion, 4-way power seat on '99 model (see page 20-80), 4-way power seat on '00-03 models (see page 20-81), 8-way power seat on '99-01 models (see page 20-82), 8-way power seat on '02-03 models (see page 20-83).
3. Remove the front cover from the seat cushion, 4-way power seat on '99 model (see page 20-80), 4-way power seat on '00-03 models (see page 20-81), 8-way power seat on '99-01 models (see page 20-82), 8-way power seat on '02-03 models (see page 20-83).
4. Release the clips (A) and hooks (B) from under the seat cushion, then loosen the seat cushion cover (C).

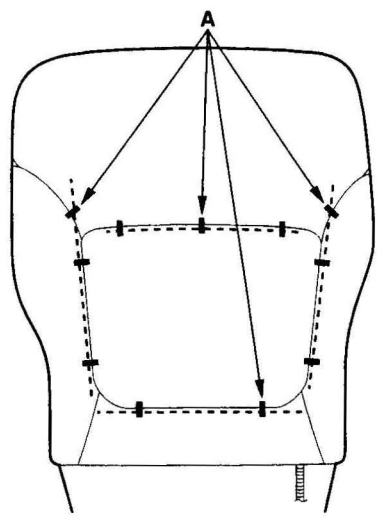


5. Pull back the edge of the seat cushion cover all the way around, and release the clips (A), then remove the seat cushion cover.

3.2TL:



3.2TL-S:



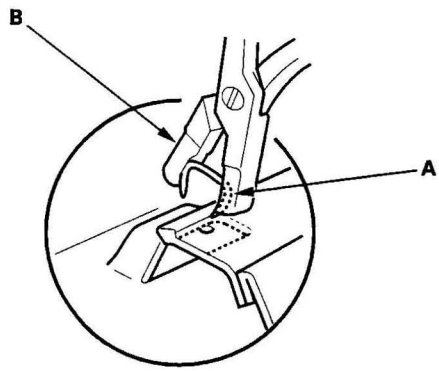
(cont'd)

Protected by AR

Front Seat Cover Replacement (cont'd)

6. Install the cover in the reverse order of removal, and note these items:

   - To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips and hooks.
   - Replace any clips you removed with new ones (A). Install them with commercially available upholstery ring pliers (B).



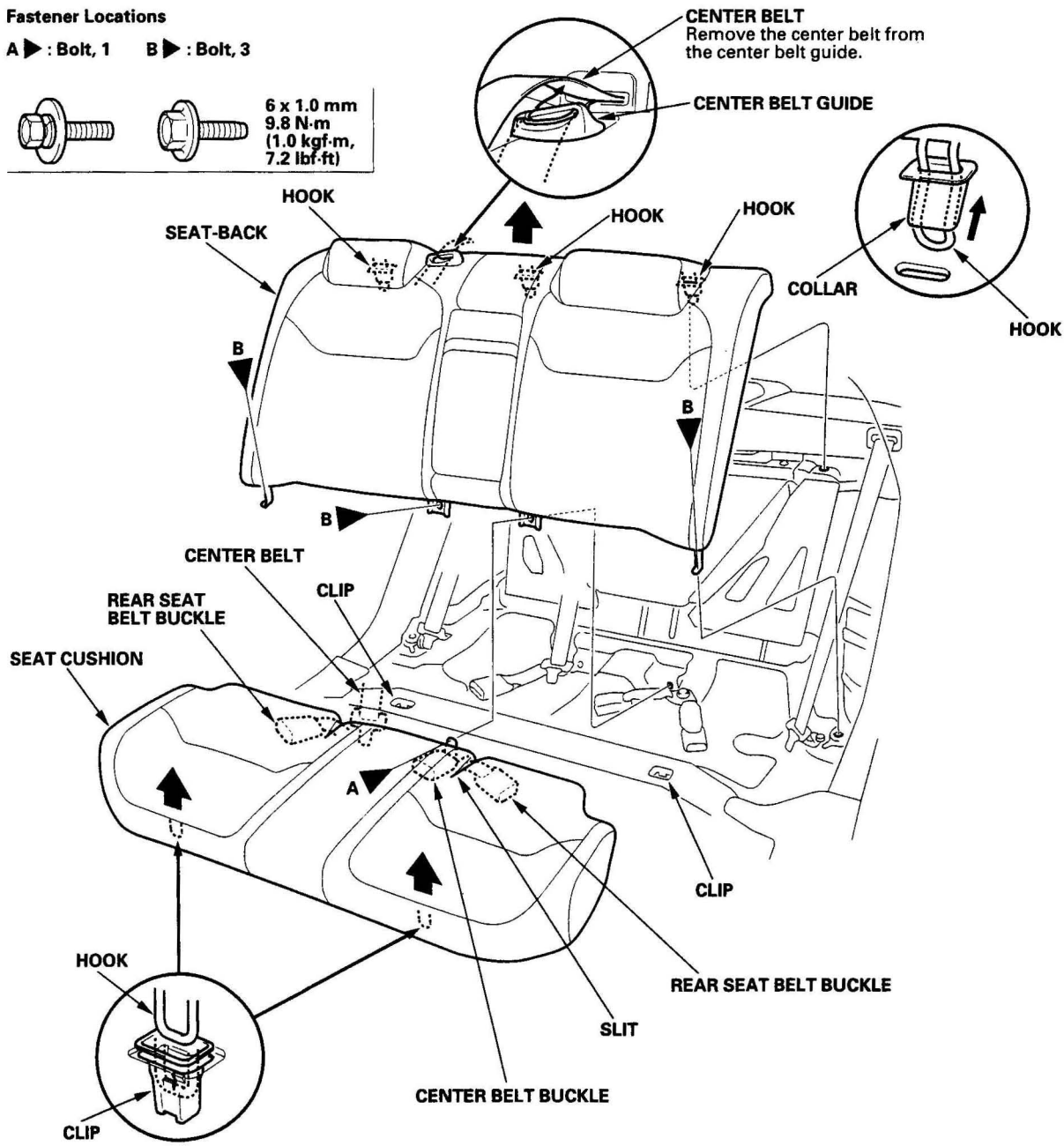
BACK

Protected by AR

Rear Seat Removal/Installation

NOTE: Take care not to scratch the body or tear the seat covers.

1. Remove the rear seat as shown. The 3.2 TL is shown, the 3.2 TL-S is similar.
2. Install the seat in the reverse order of removal, and note these items:
   - Before attaching the rear seat-back and cushion, make sure there are no twists or kinks in the rear seat belts and center belt.
   - When installing the seat cushion, slip the seat belt buckles through the slits in the seat cushion.

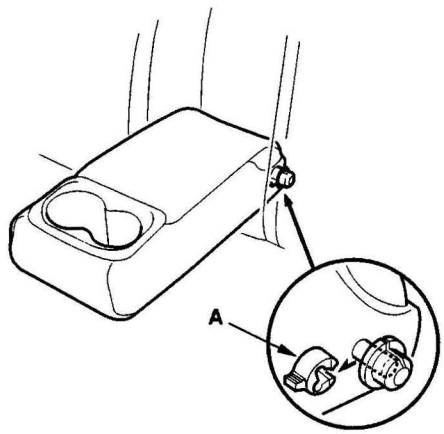


Protected by AR

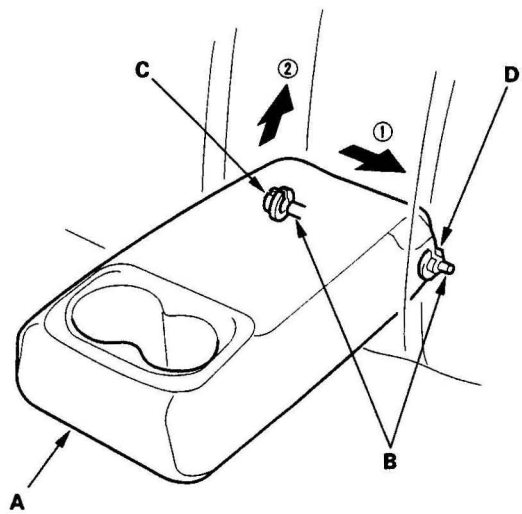
Rear Seat Armrest Replacement

NOTE: Take care not to tear the seams or damage the seat covers.

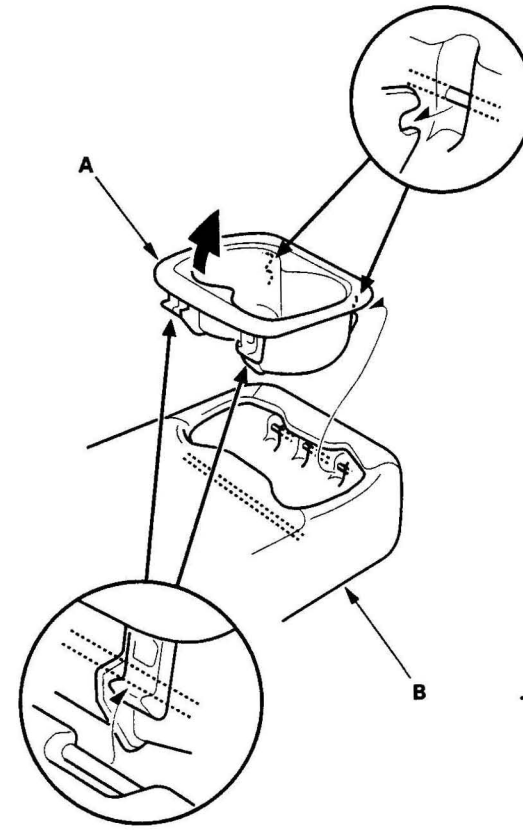
1. Remove the clip (A) from the left portion of the armrest pivot.



2. Remove the armrest.
   - –1 Slide the armrest (A) toward the driver's side of the vehicle.
   - –2 Remove the pivot shaft (B) from the collar (C) on the passenger's side of the vehicle by pulling up on the armrest, and remove the pivot shaft (B) from the collar (D) by pulling up on the armrest.



3. Remove the beverage holder (A) from the armrest (B).



4. Install the armrest in the reverse order of removal.

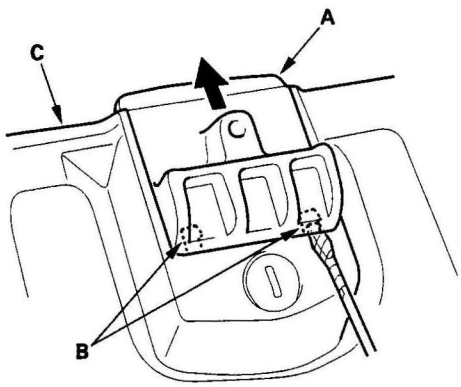
BACK

Protected by AR

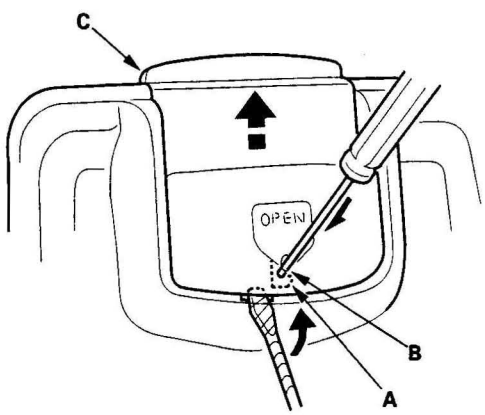
Trunk Pass-through Cover Key Cylinder Replacement

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to scratch the cover.

1. Using a flat-tip screwdriver, pry the rear seat handle (A) up at either hook portion (B) of the trunk pass through cover (C). Then slide the handle halfway up.

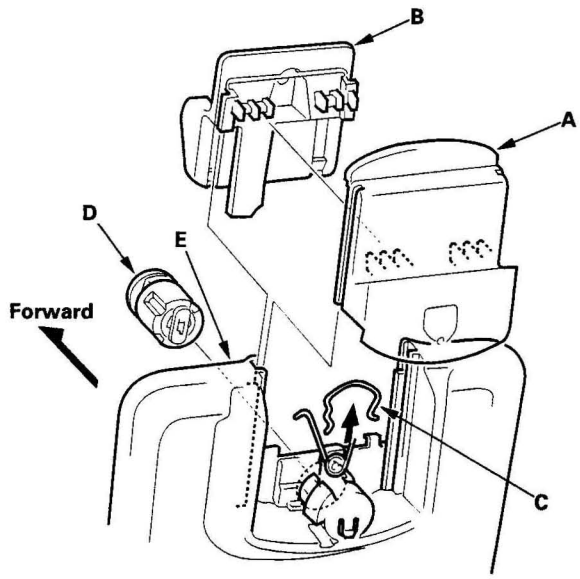


2. From the trunk compartment side of the cover, use a small screwdriver and press the inside hook (A) down through the access hole (B).



3. While pressing the hook, pry the trunk handle (C) up with a flat-tip screwdriver.

4. Remove the trunk handle (A) and rear seat handle (B) together at the same time.



5. Remove the retainer clip (C), then remove the trunk pass-through cover key cylinder (D) from the cover (E).

6. Install the key cylinder in the reverse order of removal, and note these items:

   - Put the two handles together before installing them on the trunk pass-through cover.
   - Make sure the trunk pass-through cover opens properly and locks securely.

BACK

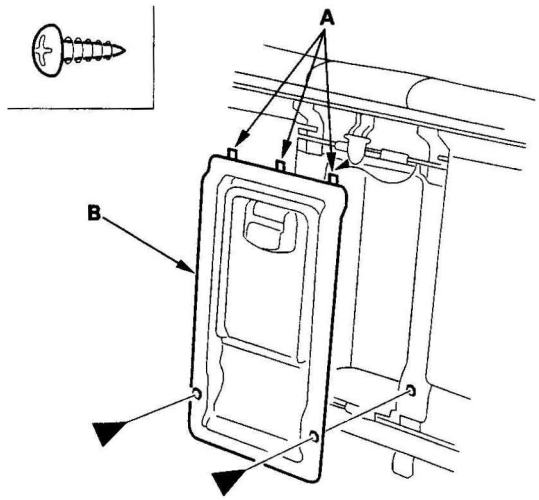
Protected by AR

Rear Seat-back Cover Replacement

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.

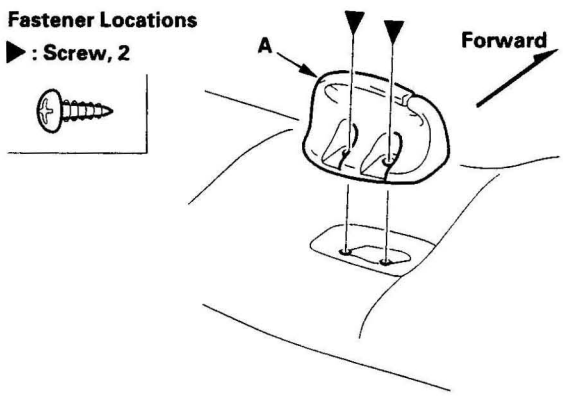
1. Remove the seat-back (see page 20-95).
2. Remove the armrest (see page 20-96).
3. Remove the screws, and detach the hooks (A), then remove the trunk pass-through cover (B).

Fastener Locations
▶ : Screw, 2



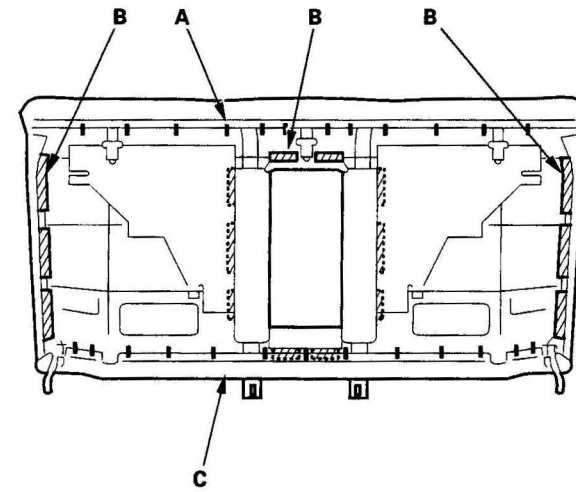
4. Remove the screws, then remove the center belt guide (A).

Fastener Locations
▶ : Screw, 2

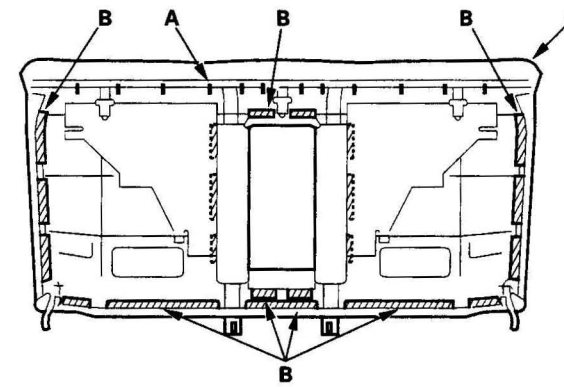


5. Release all the clips (A) and hook strips (B), and fold back the seat-back cover (C).

'99-01 models:



'02-03 models:

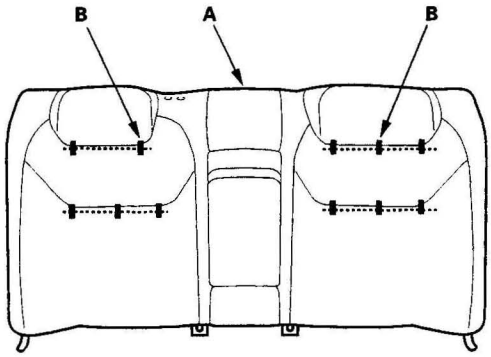


BACK

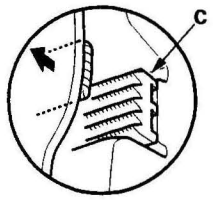
Protected by AR

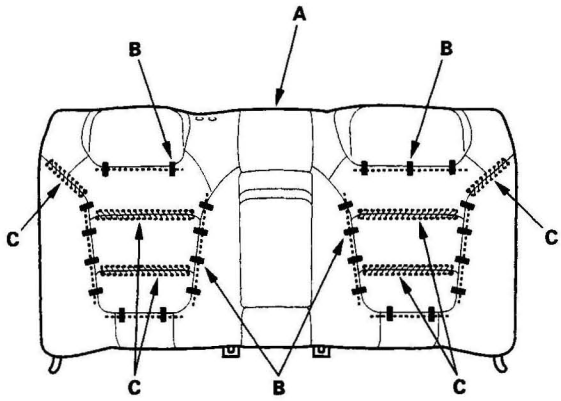
6. Pull back the edge of the seat-back cover (A) all the way around, and release the clips (B) and fastener (C) (3.2TL-S), then remove the seat-back cover.

3.2TL:



3.2TL-S:





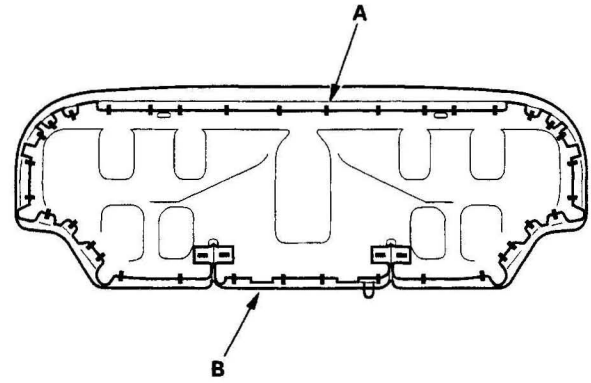
7. Install the cover in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hooks, clips, and fasteners.
- Replace any clips you removed with new ones. Install them with commercially available upholstery ring pliers.

Rear Seat Cushion Cover Replacement

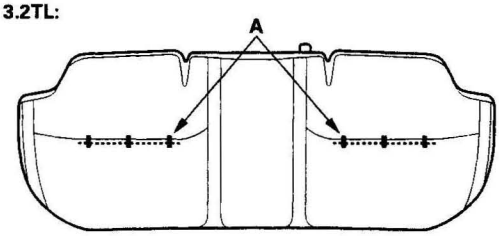
1. Remove the seat cushion (see page 20-95).

2. Release all the clips (A) from under the seat cushion, and fold back the seat cushion cover (B).

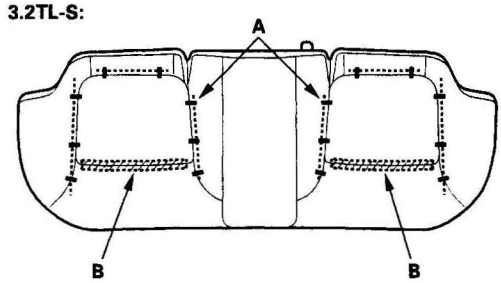


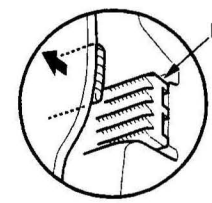
3. Pull back the edge of the seat cushion cover all the way around, and release the clips (A) and fasteners (B) (3.2TL-S), then remove the seat cushion cover.

3.2TL:



3.2TL-S:





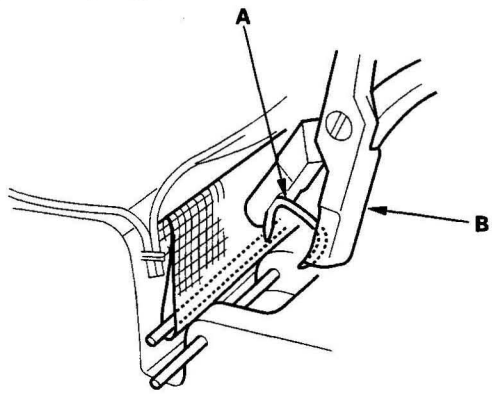
(cont'd)

Protected by AR

Rear Seat Cushion Cover Replacement (cont'd)

4. Install the cover in the reverse order of removal, and note these items:

   - To prevent wrinkles, make sure the material is stretched evenly over the pad before securing the clips and fasteners.
   - Replace any clips (A) you removed with new ones. Install them with commercially available upholstery ring pliers (B).



BACK

Protected by AR

Front Bumper Removal/Installation

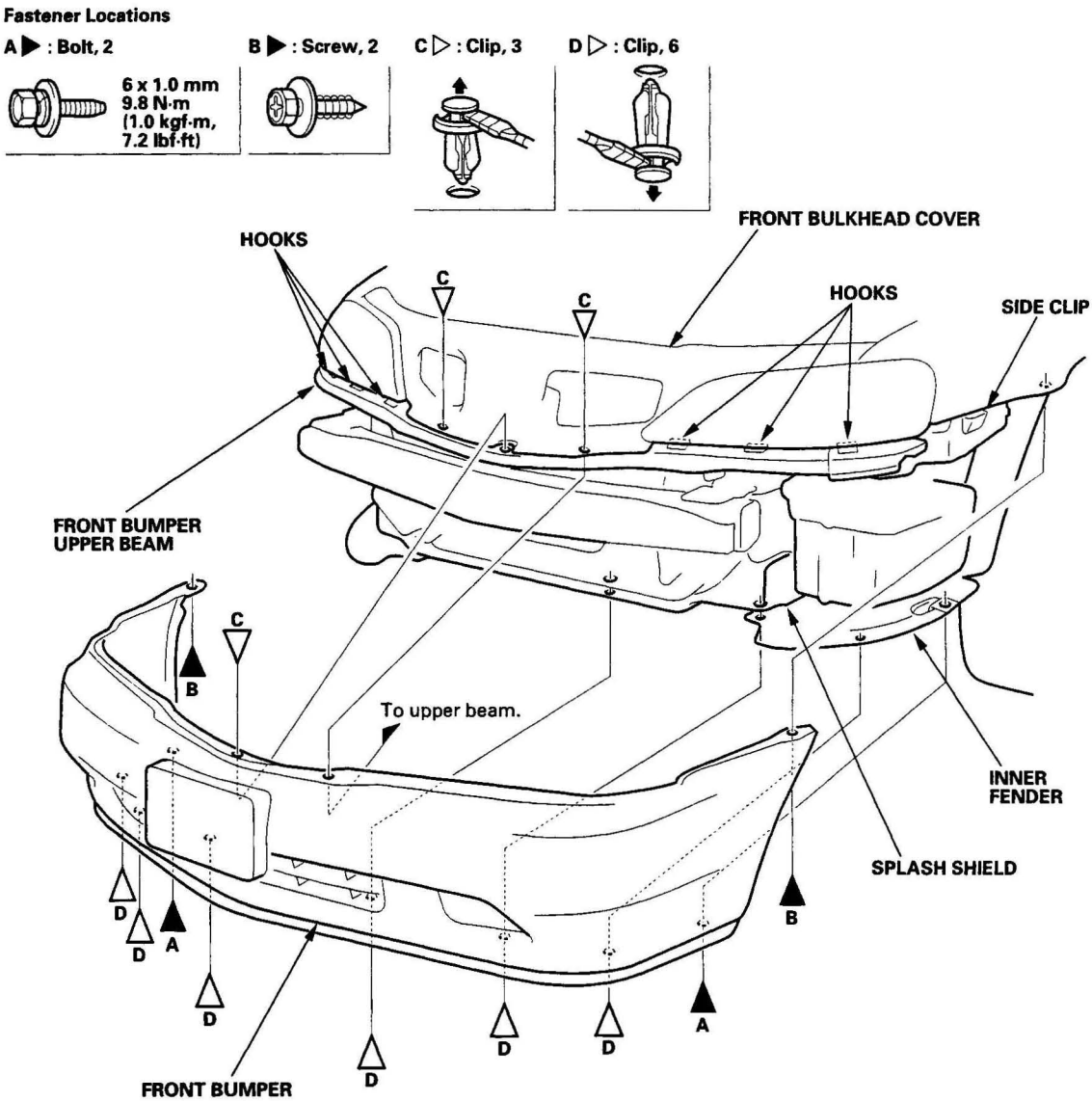
'99-01 Models

NOTE:
- An assistant is helpful when removing the front bumper.
- Take care not to scratch the front bumper and body.
- Put on gloves to protect your hands.

1. Remove the front bumper as shown.

2. Install the bumper in the reverse order of removal, and note these items:

   - Make sure the front bumper engages the side clips and hooks of the upper beam securely.
   - Replace any damaged clips.



(cont'd)

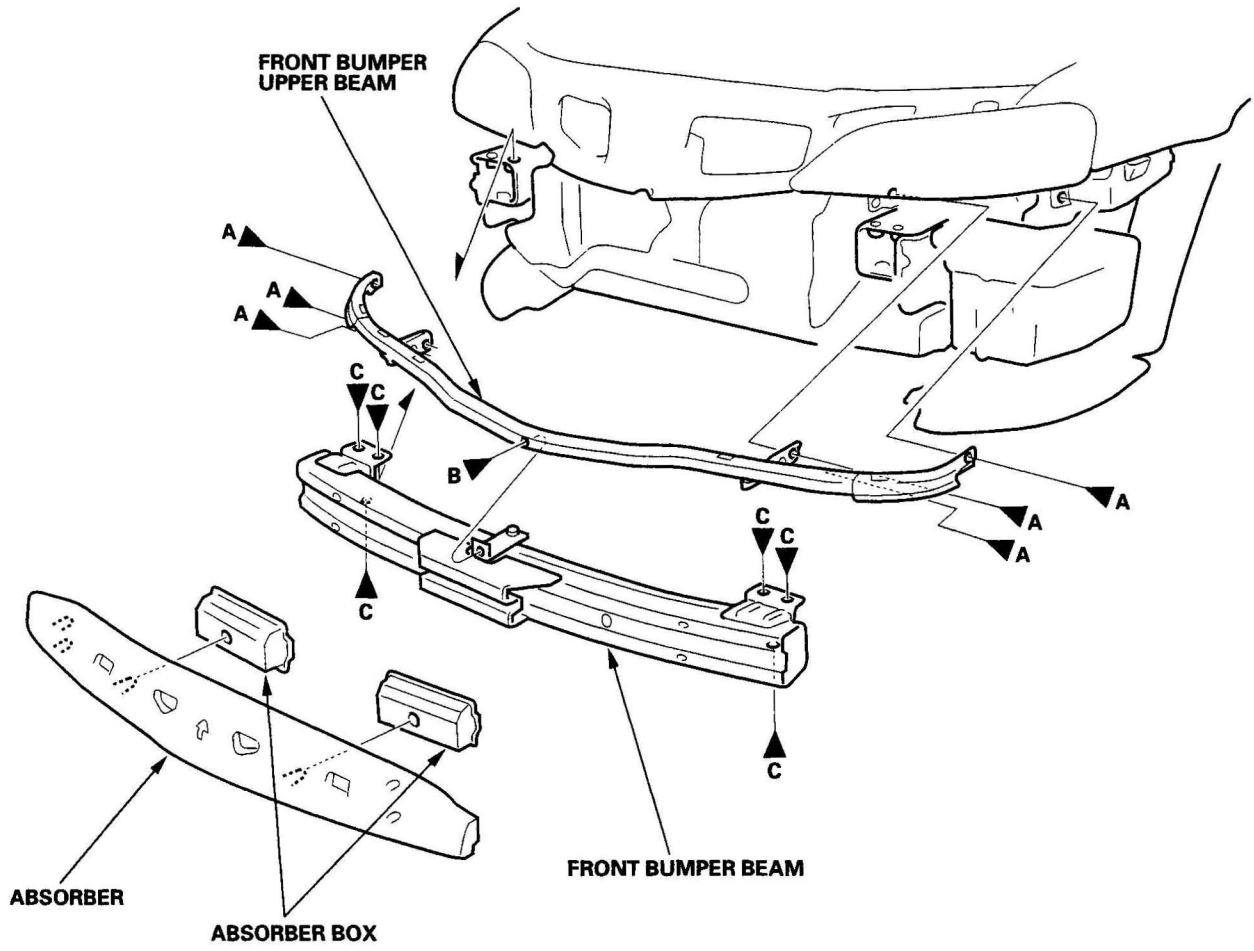
Protected by AR

Front Bumper Removal/Installation (cont'd)

Fastener Locations

A ▶ : Bolt, 6 B ▶ : Bolt, 1 C ▶ : Bolt, 6





BACK

Protected by AR

'02-03 Models

NOTE:
- An assistant is helpful when removing and installing the front bumper.
- Take care not to scratch the front bumper and body.
- Put on gloves to protect your hands.

1. Remove the front bumper as shown.

2. Install the bumper in the reverse order of removal, and note these items:

   - Make sure the front bumper engages the side clips and hooks of the corner upper beam on each side securely.
   - Replace any damaged clips.

Fastener Locations

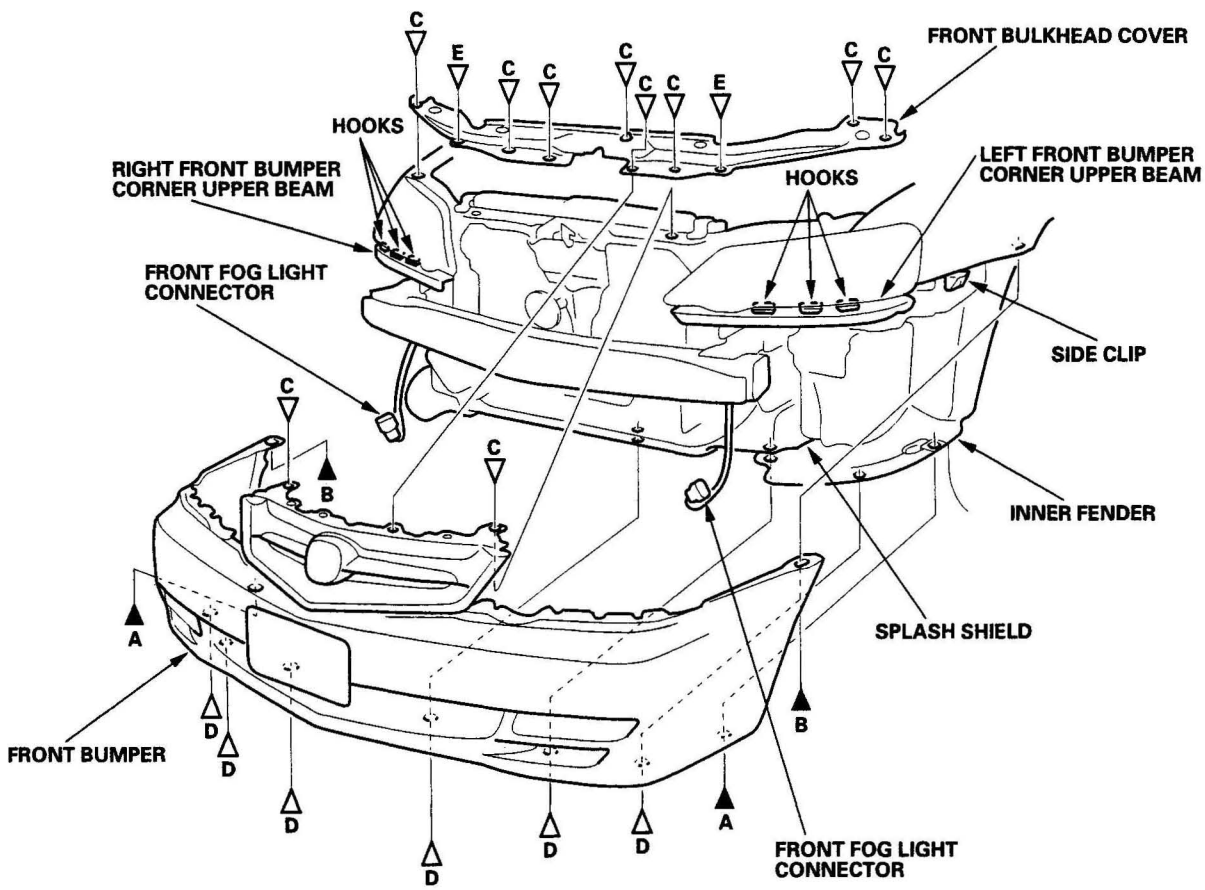
A ▶ : Bolt, 2 — 6 x 1.0 mm, 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

B ▶ : Screw, 2

C ▷ : Clip, 10

D ▷ : Clip, 6

E ▷ : Clip, 2



(cont'd)

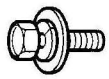
BACK

Protected by AR

Front Bumper Removal/Installation (cont'd)

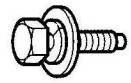
Fastener Locations

A ▶ : Bolt, 6

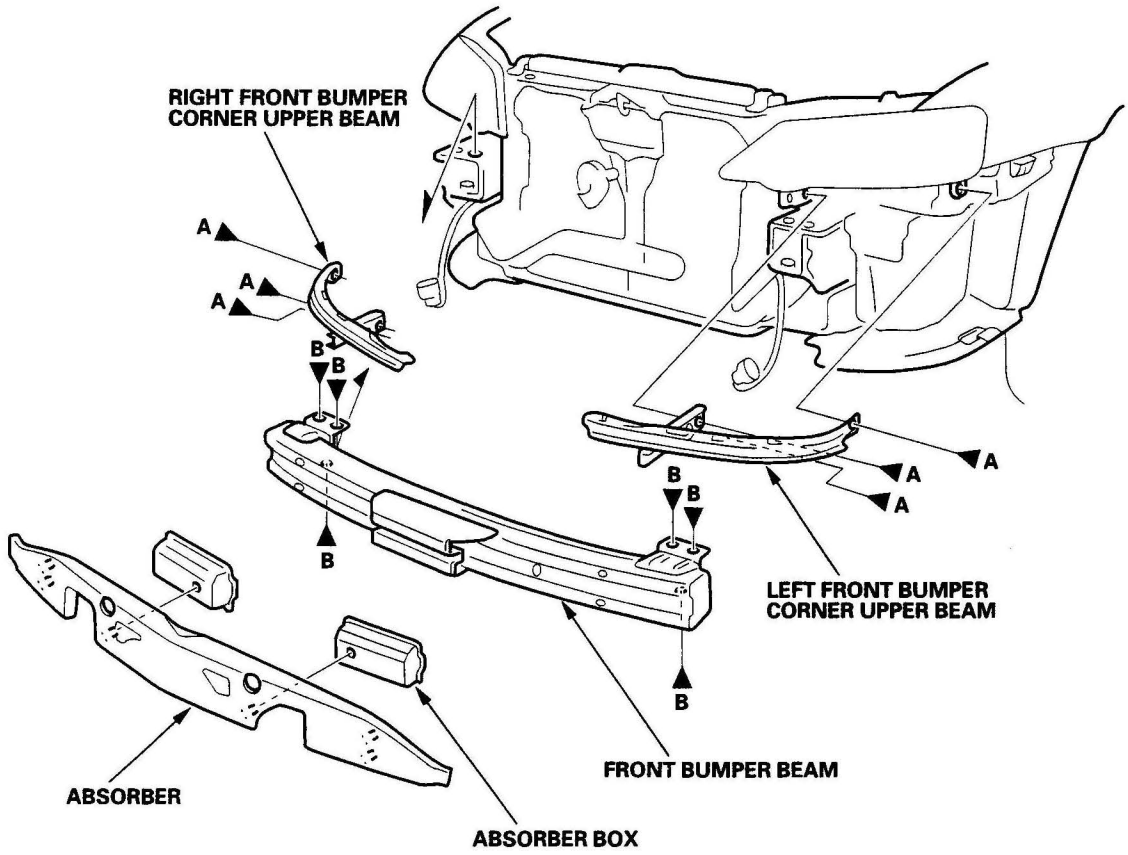


6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)

B ▶ : Bolt, 6



8 x 1.25 mm
22 N·m
(2.2 kgf·m,
16 lbf·ft)



BACK

Protected by AR

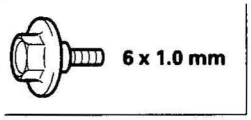
Front Bumper Disassembly/Reassembly

NOTE: Take care not to scratch the front bumper and front spoiler.

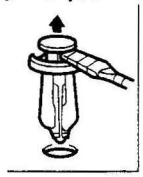
1. Disassemble the front bumper as shown.
2. Reassemble the bumper in the reverse order of disassembly, and replace any damaged clips.

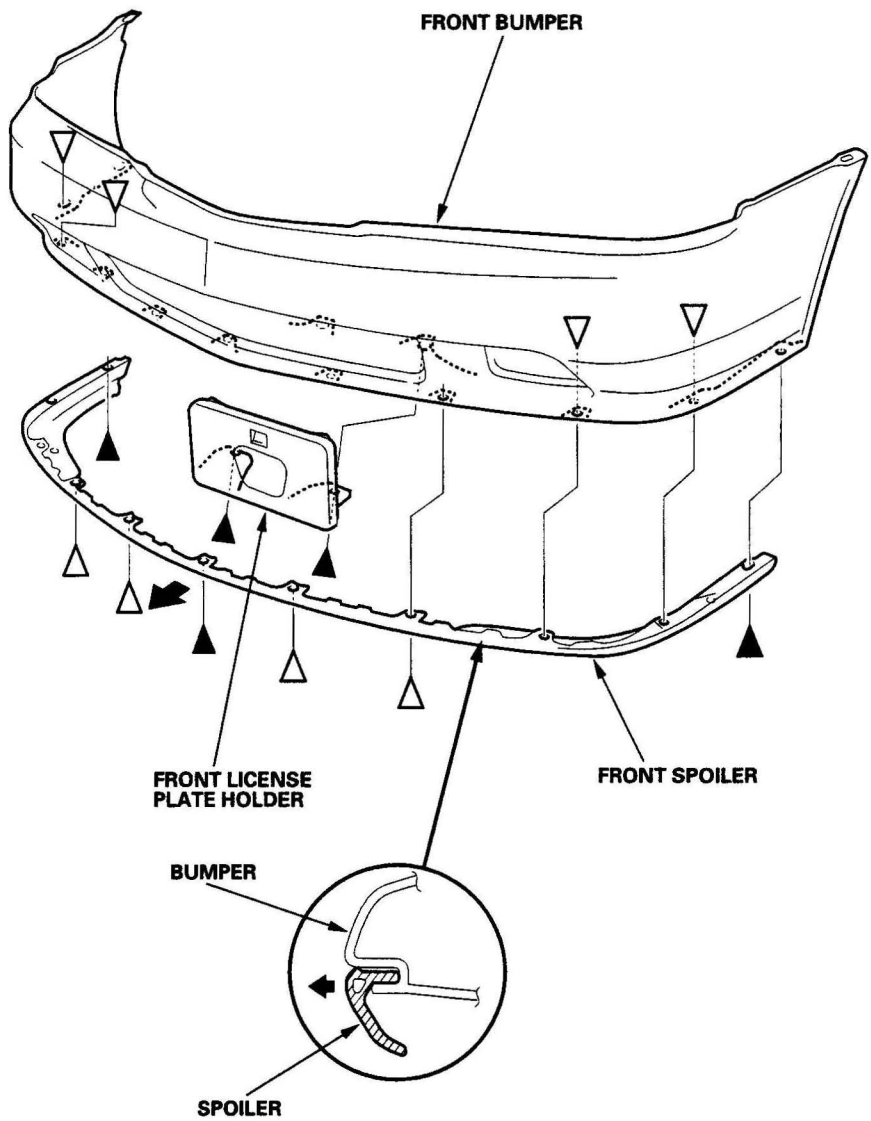
Fastener Locations

▶ : Bolt, 5



▷ : Clip, 8





Protected by AR

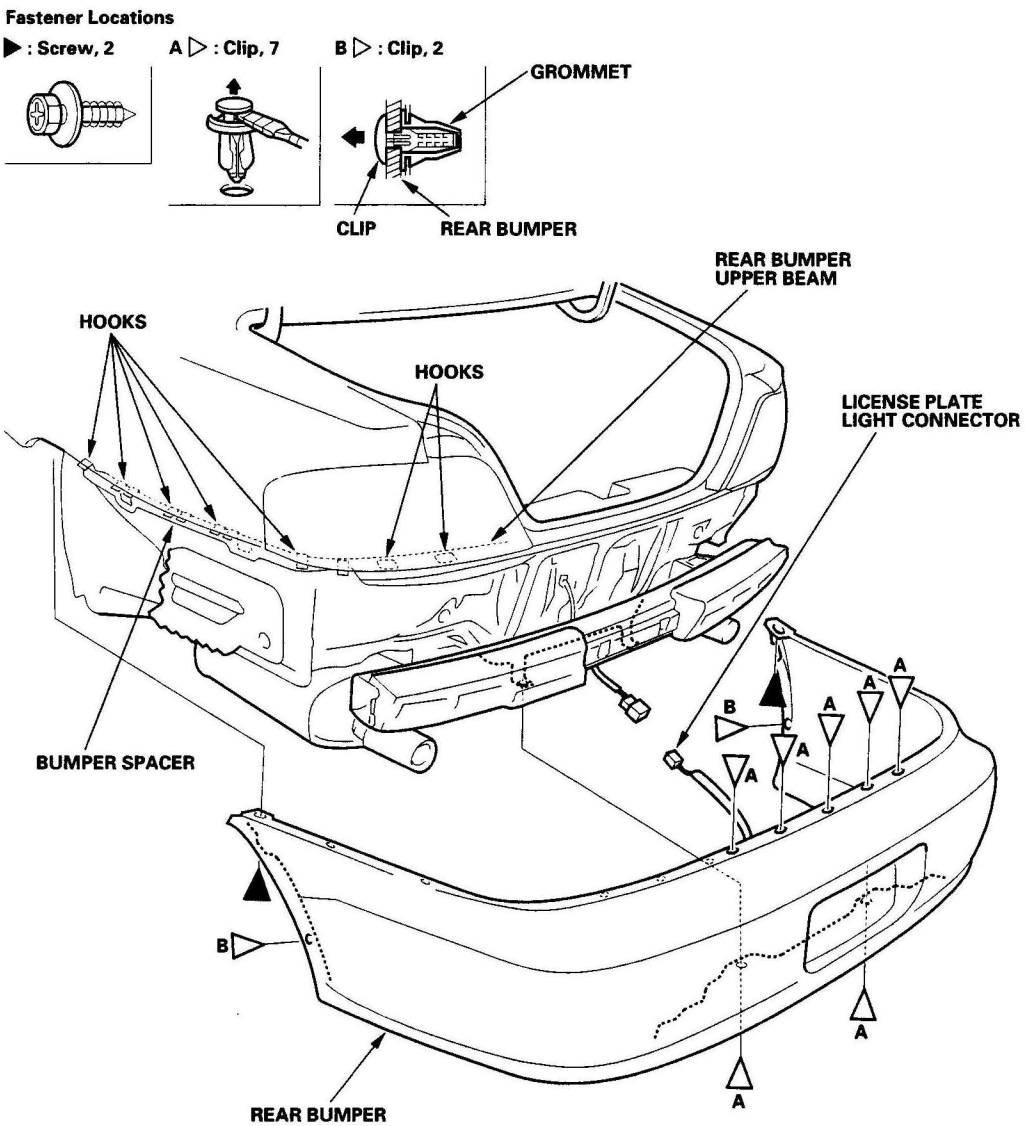
Rear Bumper Removal/Installation

NOTE:
- An assistant is helpful when removing the rear bumper.
- Take care not to scratch the rear bumper and body.
- Put on gloves to protect your hands.

1. Remove the rear bumper as shown.

2. Install the bumper in the reverse order of removal, and note these items:

   - Make sure the rear bumper engages the hooks of the bumper spacers and upper beam on each side securely.
   - Make sure the license plate light connector is plugged in properly.
   - Replace any damaged clips.



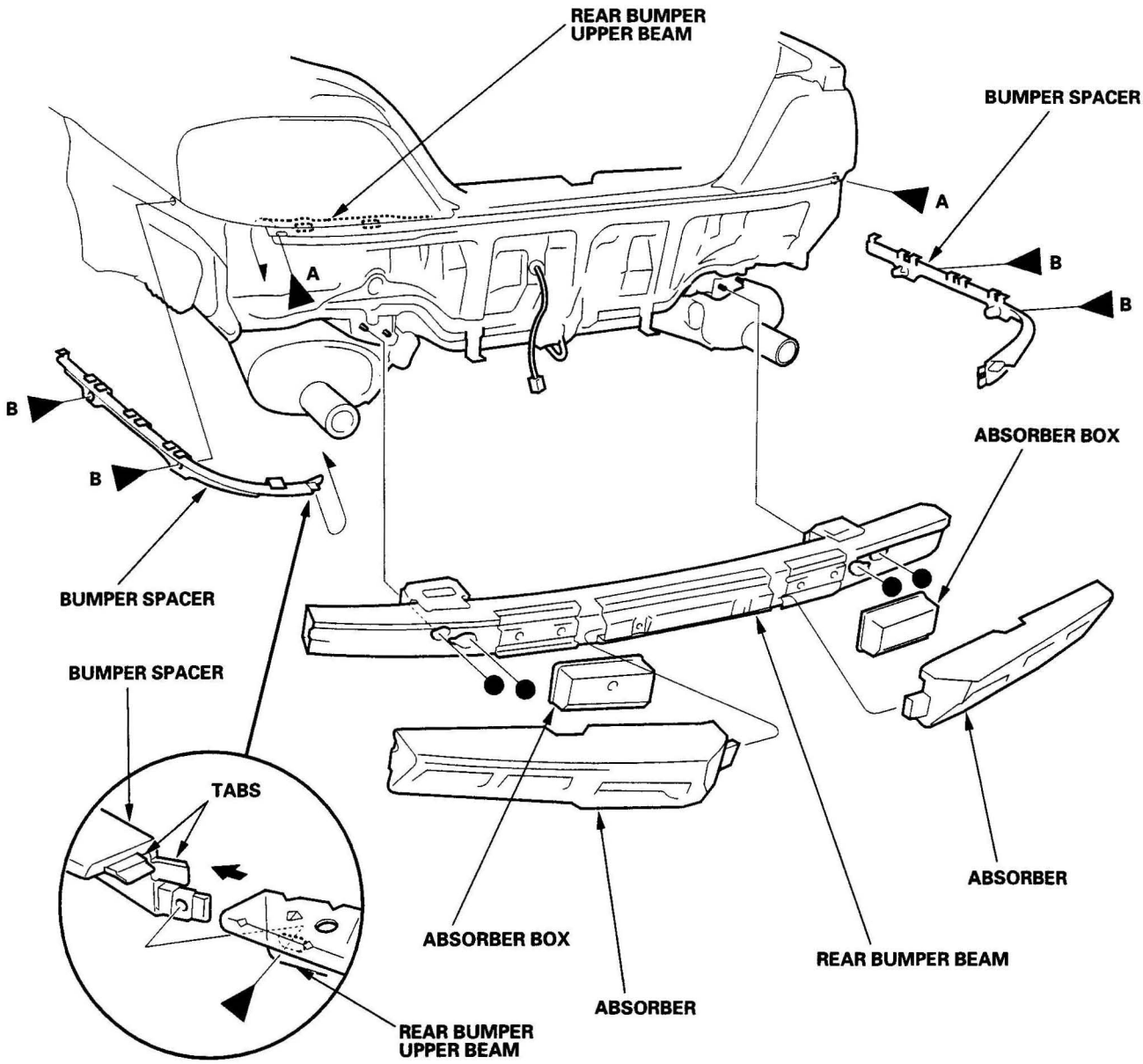
BACK

Protected by AR

Fastener Locations

● : Nut, 4 A ▶ : Screw, 2 B ▶ : Screw, 4

8 x 1.25 mm 22 N·m (2.2 kgf·m, 16 lbf·ft)		



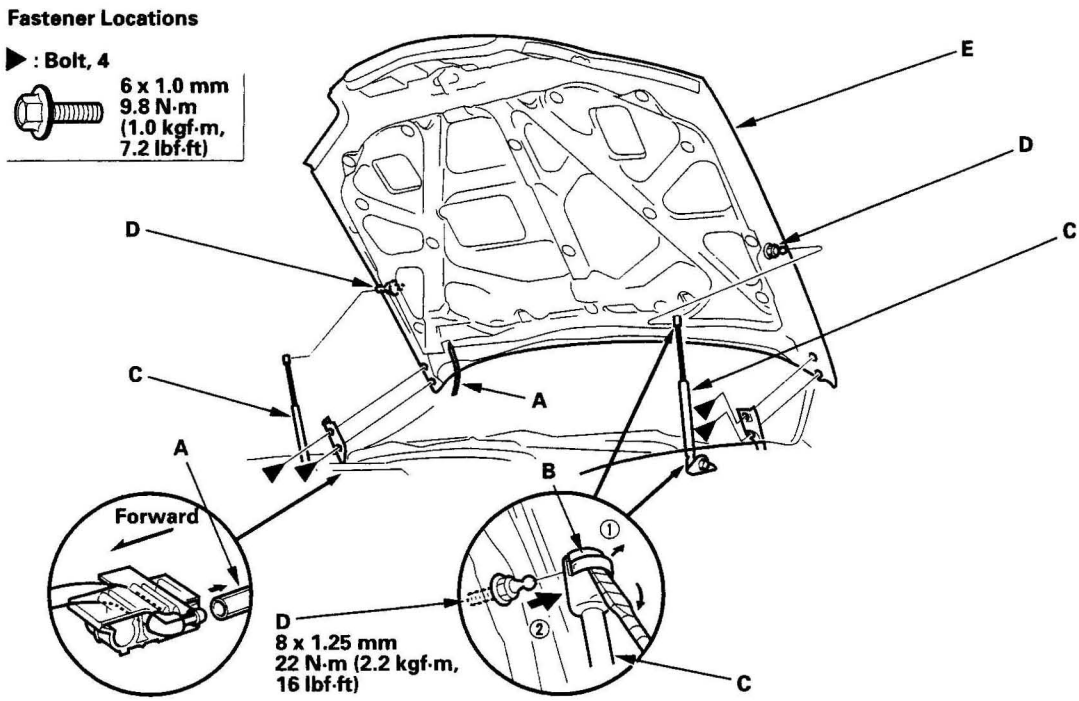
BACK

Protected by AR

Hood

Replacement

1. Disconnect the windshield washer tube (A).

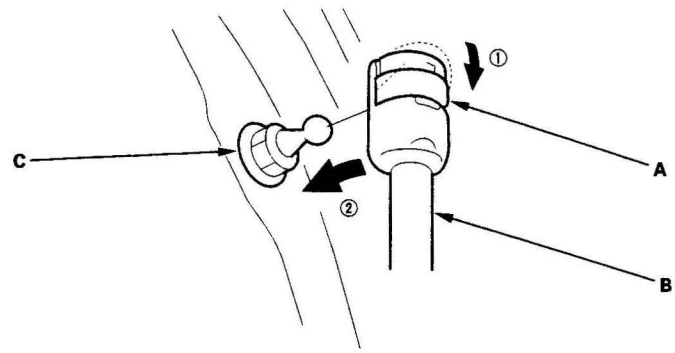


2. With a flat-tip screwdriver, pry the clips (B) out of the support struts (C) on each hood side, then release both support struts from the pivot bolts (D) with the help of an assistant. Do not remove the clips from the support struts. If necessary, release the support strut from the pivot bolt on the body, then remove the support strut.

3. With the help of an assistant, remove the bolts, then remove the hood (E). Take care not to damage the hood and body.

4. Install the hood in the reverse order of removal, and note these items:

   - Before reattaching the support struts, adjust the hood alignment (see page 20-109).
   - Make sure the hood opens properly and locks securely.
   - Make sure the windshield washer tubes are connected properly.
   - When reattaching the support struts, set the clips (A) to the original position, then attach the support struts (B) on the pivot bolts (C) by pushing the support strut.



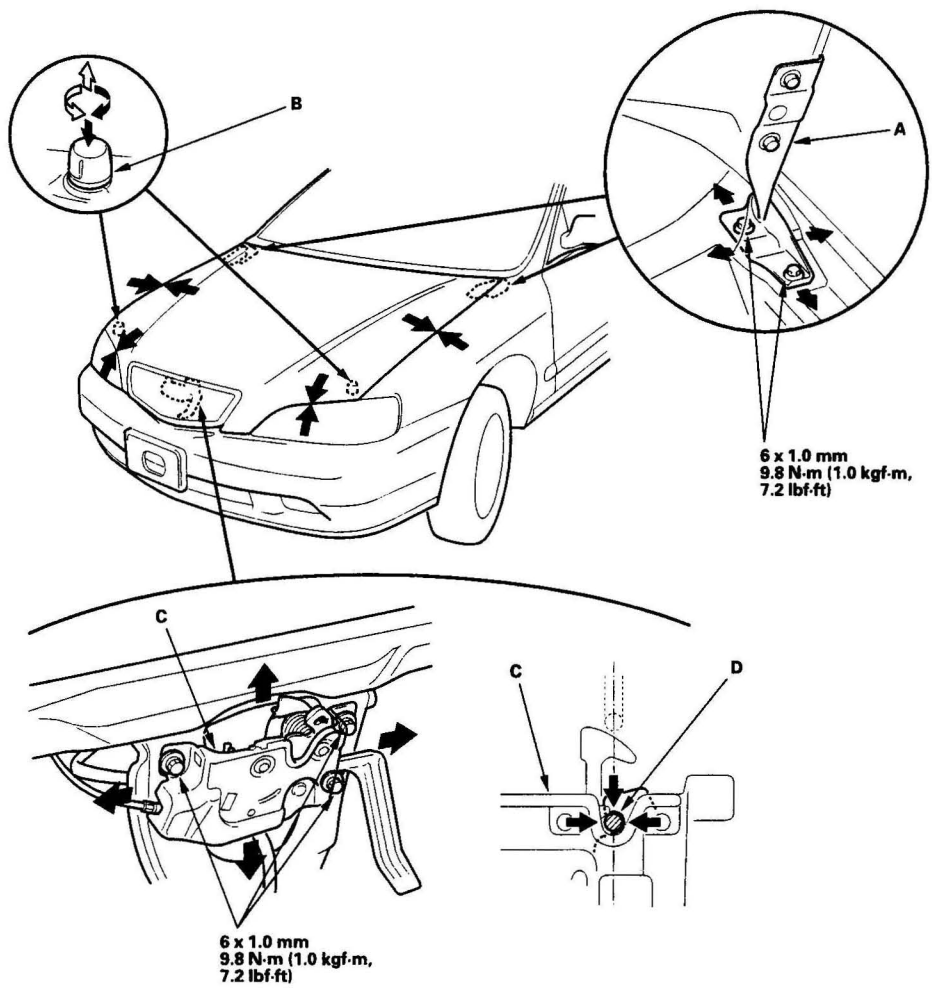
BACK

Protected by AR

Adjustment

'99-01 Models

1. Remove the support strut from each side of the hood (see step 2 on page 20-108).
2. Slightly loosen each hood hinge bolt.
3. Adjust the hood alignment in this sequence.
   - Adjust the hood right and left, as well as forward and rearward, by using the elongated holes on the hood hinge (A).
   - Turn the hood edge cushions (B), as necessary, to make the hood fit flush with the body at front and side edges.



4. Remove the front bulkhead cover (see step 1 on page 20-135), and adjust the hood latch (C) to obtain the proper height at the forward edge, and move the hood latch right or left until the striker (D) is centered in the hood latch.
5. Tighten each bolt securely.

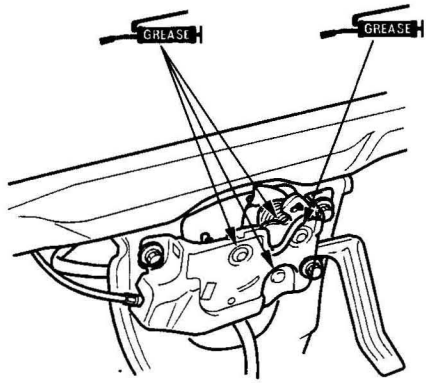
(cont'd)

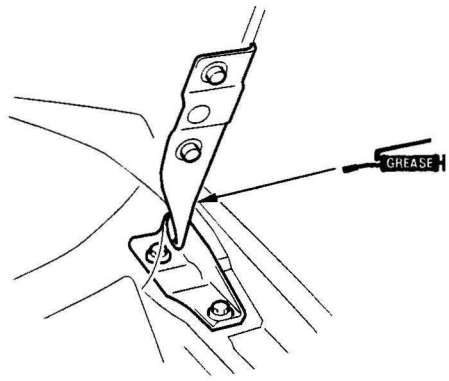
BACK

Protected by AR

Adjustment (cont'd)

6. Install the support strut to each side of the hood (see step 4 on page 20-108).
7. Check that the hood opens properly and locks securely.
8. Apply touch-up paint to the hinge mounting and around the hinges.
9. Grease each location of the hood latch and hood hinge as indicated by the arrows.





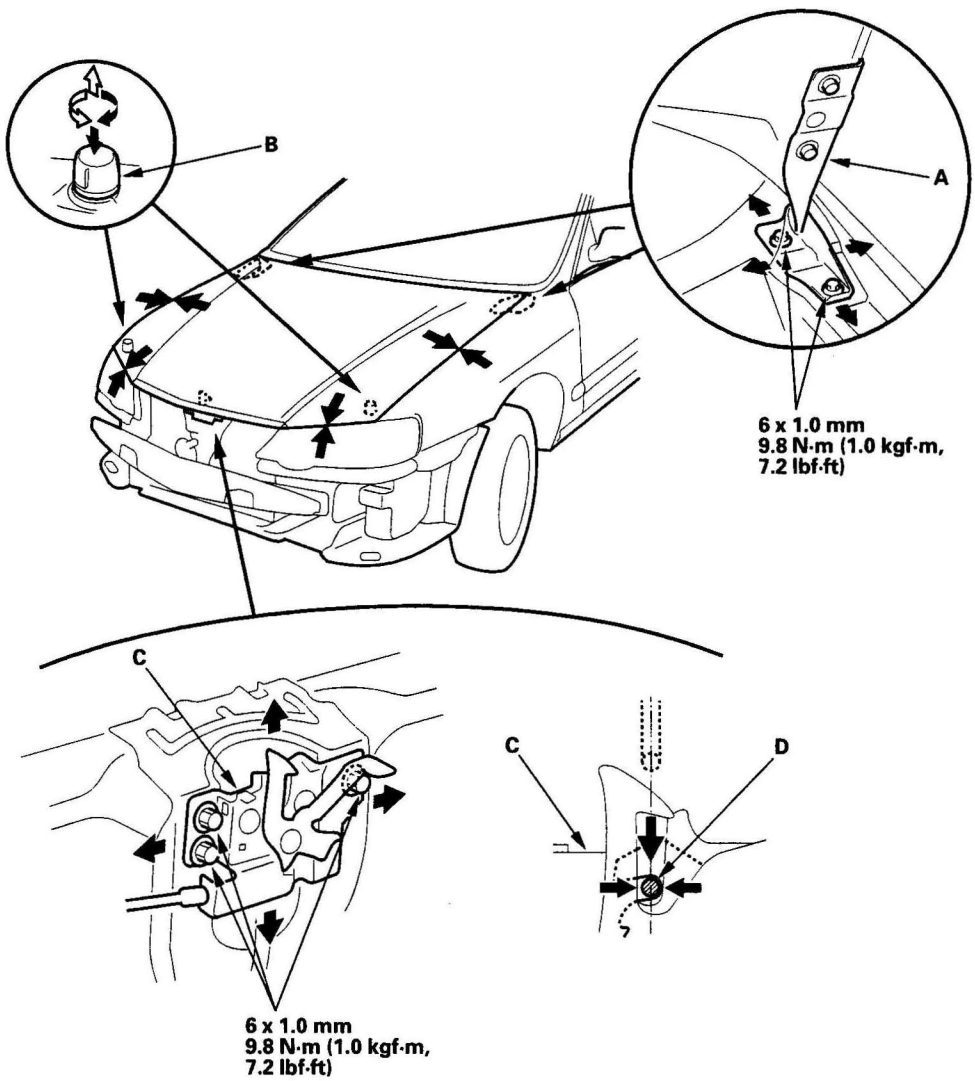
10. Reinstall the front bulkhead cover (see step 1 on page 20-135).

BACK

Protected by AR

'02-03 Models

1. Remove the support strut from each side of the hood (see step 2 on page 20-108).
2. Slightly loosen each hood hinge bolt.
3. Adjust the hood alignment in this sequence.
   - Adjust the hood right and left, as well as forward and rearward, by using the elongated holes on the hood hinge (A).
   - Turn the hood edge cushions (B), as necessary, to make the hood fit flush with the body at front and side edges.



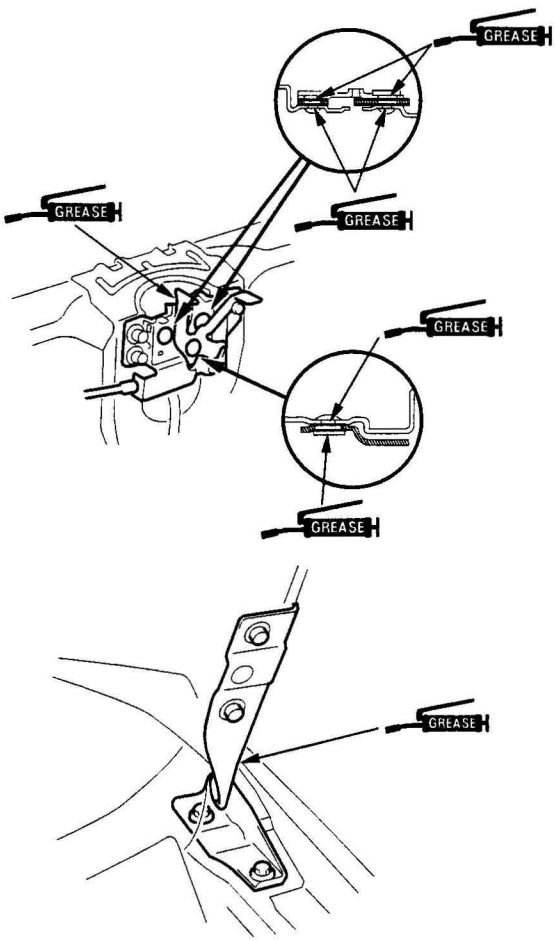
4. Remove the front bumper (see page 20-103), and the hood latch cover (see step 2 on page 20-136). Adjust the hood latch (C) to obtain the proper height at the forward edge, and move the hood latch right or left until the striker (D) is centered in the hood latch.
5. Tighten each bolt securely.

(cont'd)

Protected by AR

Adjustment (cont'd)

6. Install the support strut to each side of the hood (see step 4 on page 20-108).
7. Check that the hood opens properly and locks securely.
8. Apply touch-up paint to the hinge mounting and around the hinges.
9. Grease each location of the hood latch and hood hinge as indicated by the arrows.



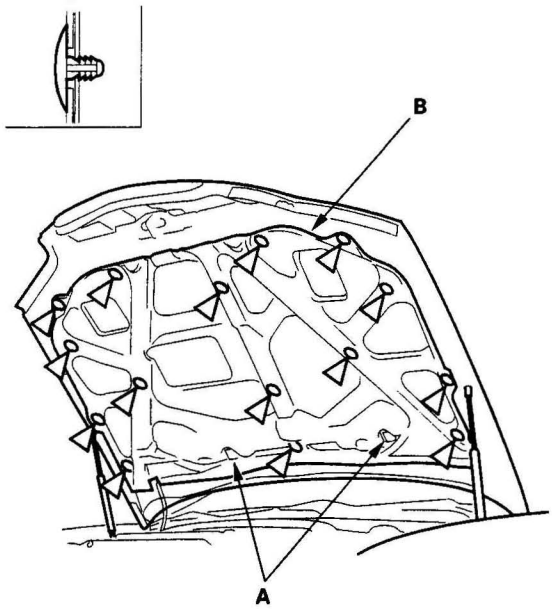
10. Reinstall the front bumper (see page 20-103).

Hood Insulator Replacement

1. Using a clip remover, detach the clips. Release the hooks (A), then remove the hood insulator (B). Take care not to scratch the hood.

Fastener Locations

▷: **Clip, 15**



2. Install the insulator in the reverse order of removal, and replace any damaged clips.

BACK

Protected by AR

Hood Seal Replacement

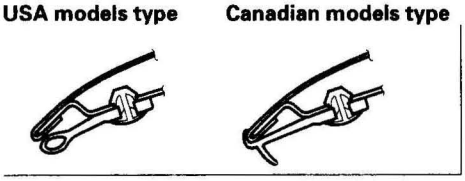
NOTE:
- Take care not to scratch the hood.
- Use a clip remover to remove the clips.

1. Remove the hood seal as shown.
2. Install the seal in the reverse order of removal, and replace any damaged clips.

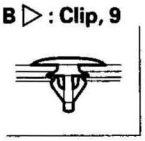
Fastener Locations

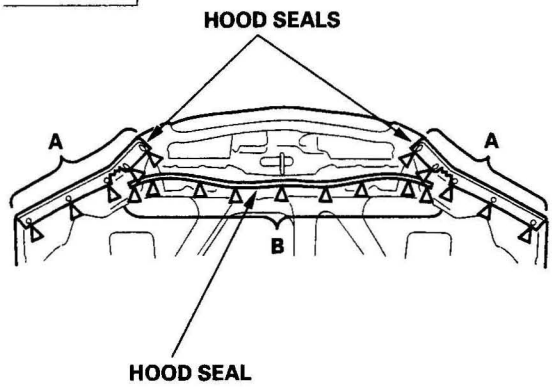
A ▷ : Clip, 10

USA models type **Canadian models type**



B ▷ : Clip, 9





Protected by AR

Trunk Lid

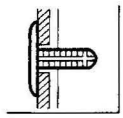
Replacement

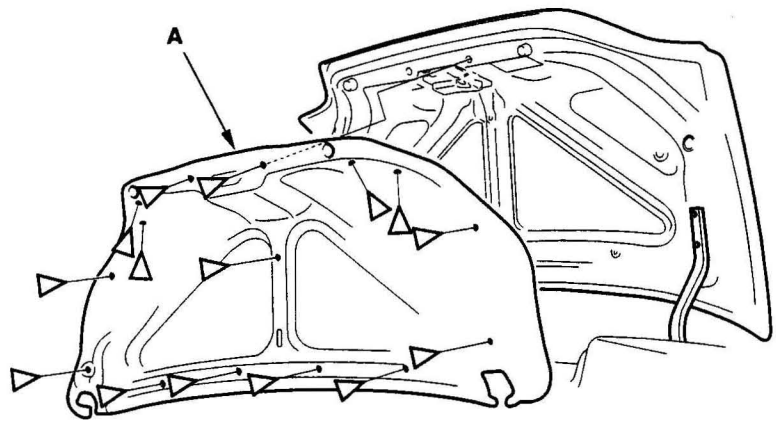
NOTE: Put on gloves to protect your hands.

1. Using a clip remover, detach the clips, then remove the trunk lid trim (A).

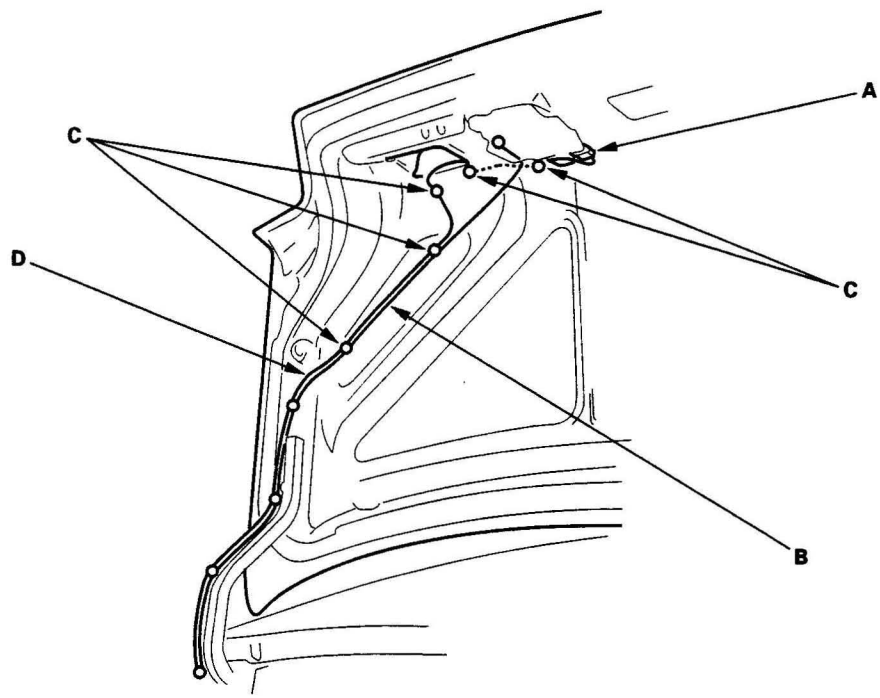
Fastener Locations

▷ : **Clip, 15**





2. Disconnect the trunk lid latch switch connector (A), and disconnect the trunk lid opener cable (B) from the trunk lid latch.



3. Detach the harness clips (C), then remove the wire harness (D) and trunk lid opener cable from the trunk lid.

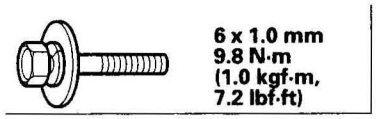
BACK

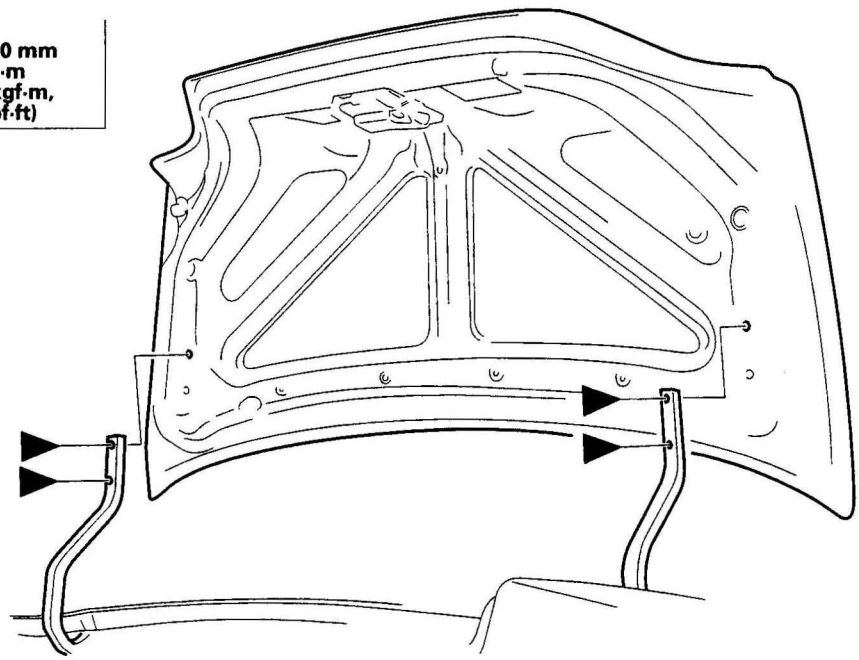
Protected by AR

4. Remove the bolts, then remove the trunk lid.

Fastener Locations

▶ : Bolt, 4





5. Install the trunk lid in the reverse order of removal, and note these items:

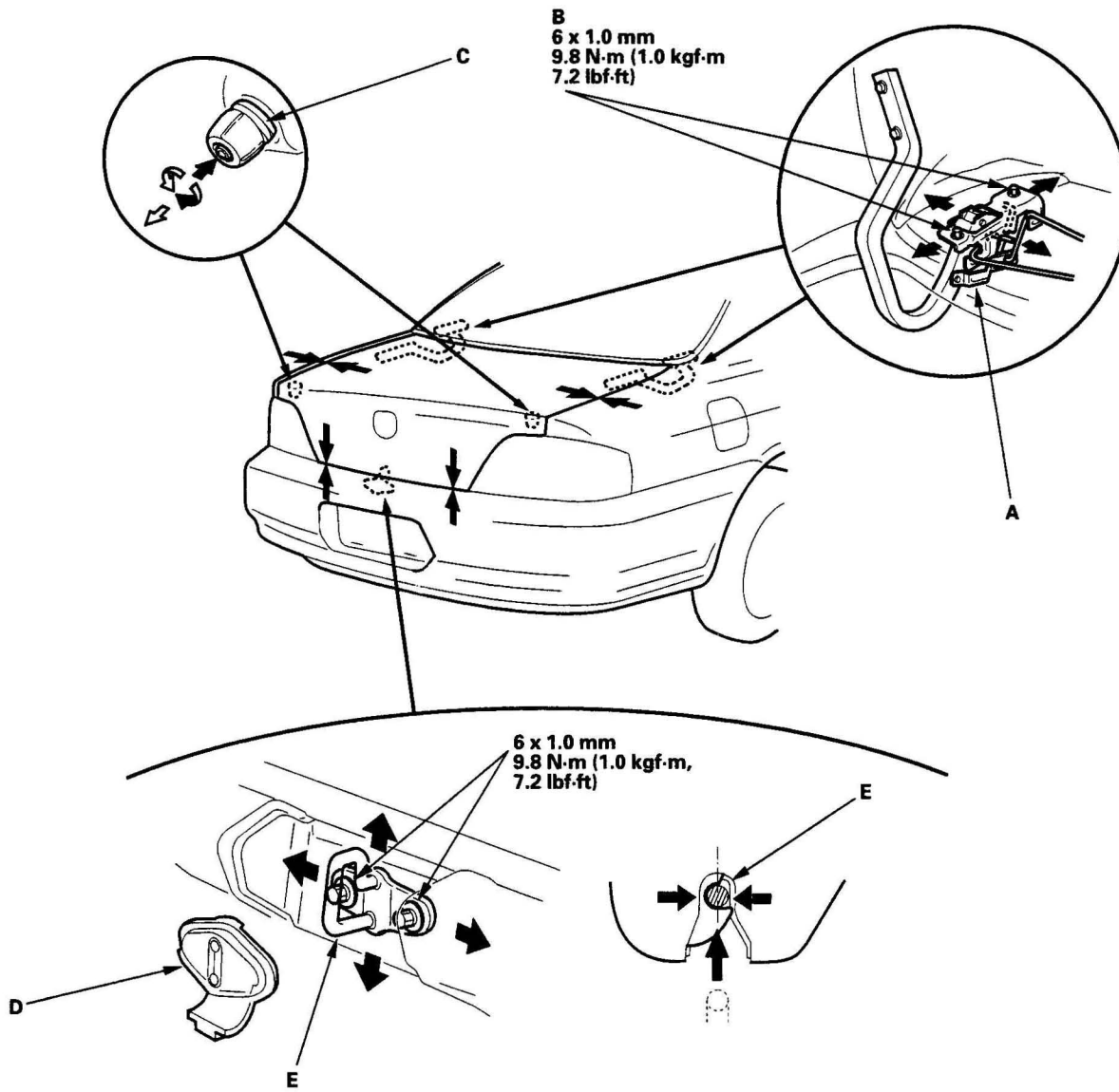
- Make sure the connector is plugged in properly and opener cable is connected properly, and the wire harness and opener cable are routed properly.
- Make sure the trunk lid opens properly and locks securely.
- Adjust the trunk lid alignment (see page 20-116).

Protected by AR

Trunk Lid

Adjustment

1. Slightly loosen each bolt.
2. Adjust the trunk lid alignment in the following sequence.
   - Remove the rear shelves, '99-01 models (see page 20-56), '02-03 models (see page 20-57), and adjust the trunk lid hinges (A) right and left, as well as forward and rearward, by using the elongated holes. Take care not to hit the rear window when loosening the bolts (B).
   - Turn the trunk lid edge cushions (C), in or out as necessary, to make the trunk lid fit flush with the body at the rear and side edges.
   - Remove the trunk rear trim panel (see page 20-58) and striker cover (D), and adjust the fit between the trunk lid and the trunk lid opening by moving the striker (E).



3. Tighten each bolt securely.
4. Make sure the trunk lid opens properly and locks securely.

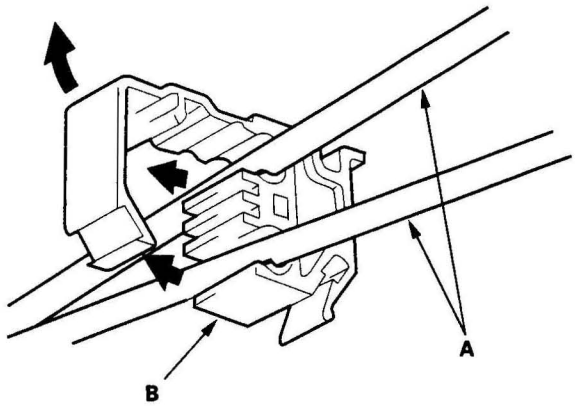
BACK

Protected by AR

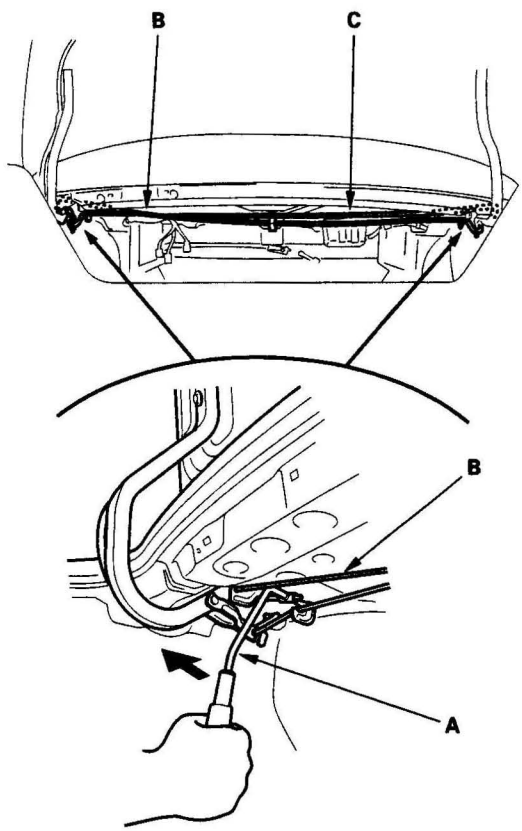
Trunk Lid Torsion Bar Replacement

1. If equipped, remove the navigation unit (see page 22-433).

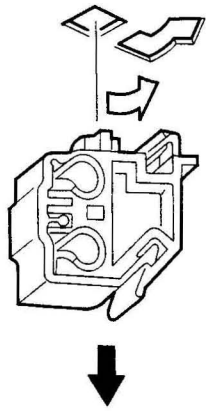
2. Remove the torsion bars (A) from the torsion bar center clip (B).



3. Put on gloves to protect your hands. Remove the torsion bars with the torsion bar tool (A) from both trunk lid hinges. First remove the right torsion bar (B), then remove the left torsion bar (C).

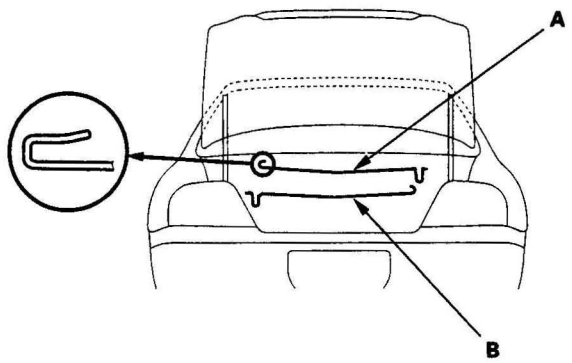


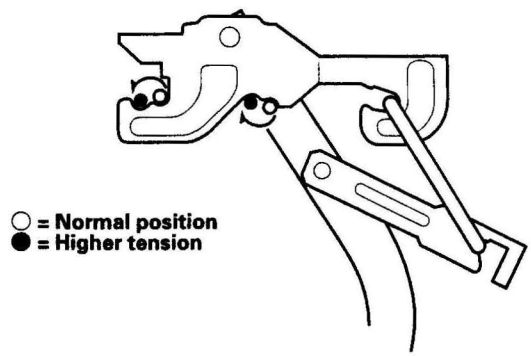
4. Remove the torsion bar center clip from the body.



5. Install the torsion bars in the reverse order of removal, and note these items:

   - The shapes of the right torsion bar (A) and left torsion bar (B) are shown. Install the torsion bars properly.
   - Adjust the torsion bars forward or rearward with the torsion bar assembly tool.
   - Make sure the trunk lid opens properly and locks securely.



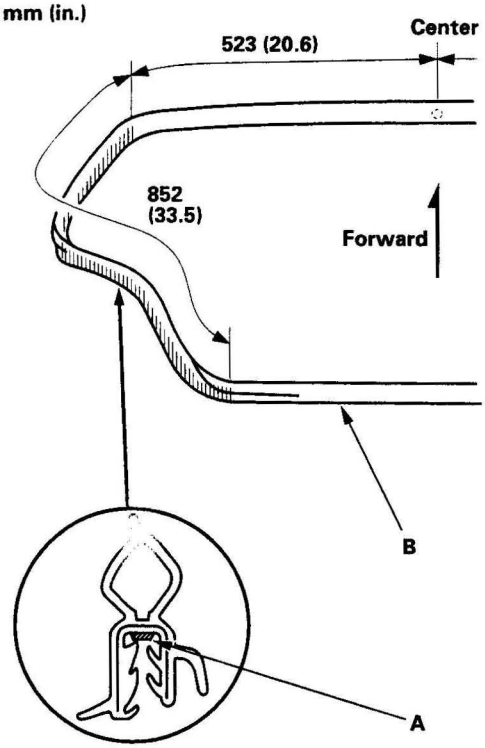


Protected by AR

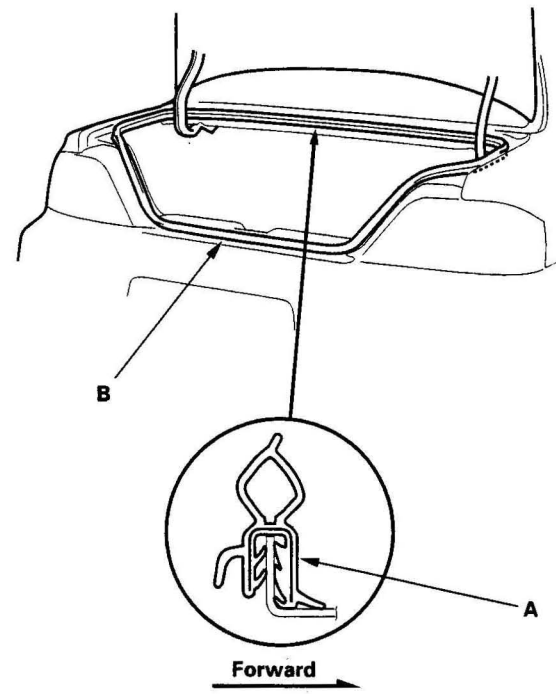
Trunk Lid Weatherstrip Replacement

1. Remove the trunk lid weatherstrip by pulling it off.
2. Apply sealant (SUNRISE MEISEI B-33C, or equivalent) (A) in the groove of the trunk lid weatherstrip (B) in the areas indicated by arrows.

Unit: mm (in.)



3. Locate the painted alignment mark (A) on the trunk lid weatherstrip (B). Align the painted mark with the alignment tab in the center of the trunk, and install the weatherstrip. Make sure it's seated completely and facing in the direction shown. Make sure there are no wrinkles in the weatherstrip.



4. Check for water leaks.

BACK

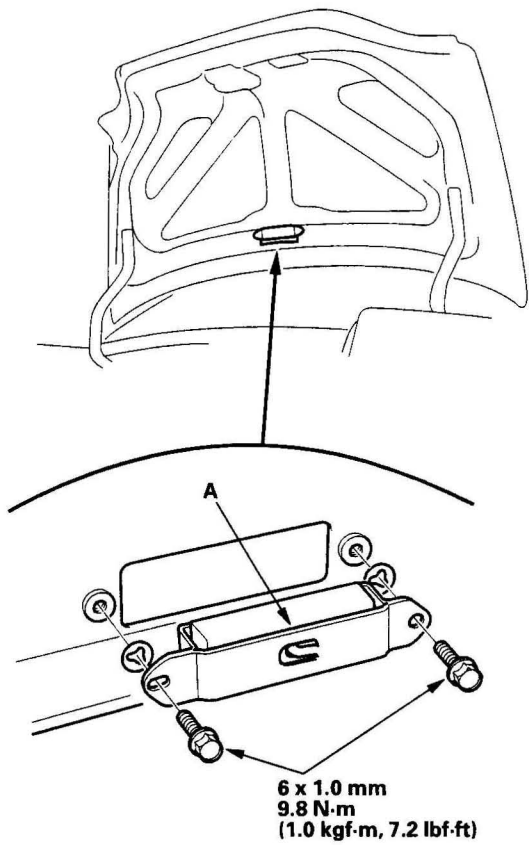
Protected by AR

Trunk Lid Dynamic Damper Replacement

For Some Models

1. Remove the trunk lid trim (see page 20-114).

2. Remove the bolts, then remove the trunk lid dynamic damper (A). Take care not to scratch the trunk lid.



3. Install the damper in the reverse order of removal.

Protected by AR

Hood Molding Replacement

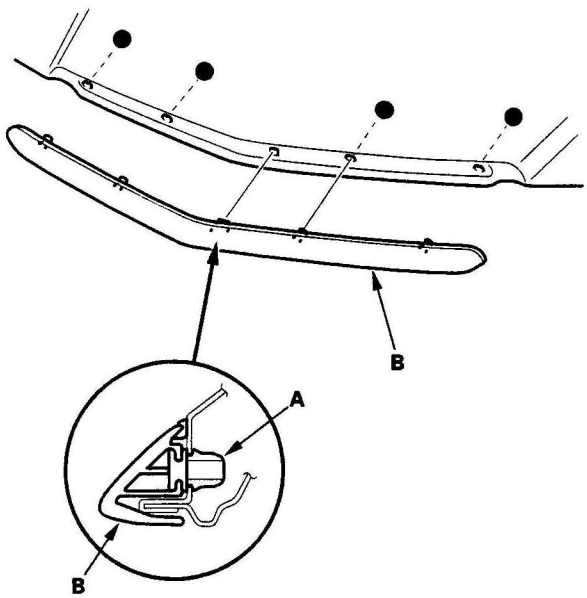
'02-03 Models

1. Remove the nuts, and detach the clip (A), then remove the hood molding (B). Take care not to scratch the hood.

Fastener Locations

● : Nut, 4





2. Install the molding in the reverse order of removal, and replace the clip if it's damaged.

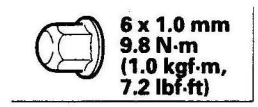
Front Grille Replacement

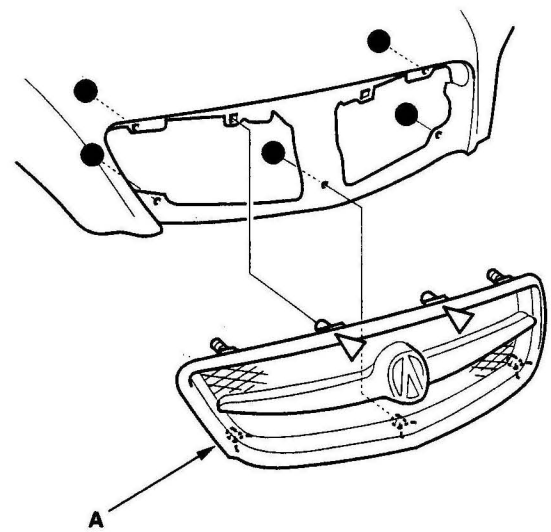
'99-01 Models

1. Remove the nuts, and detach the clips, then remove the front grille (A) from the hood. Take care not to scratch the hood.

Fastener Locations

● : Nut, 5 ▷ : Clip, 2





2. Install the grille in the reverse order of removal, and replace any damaged clips.

BACK

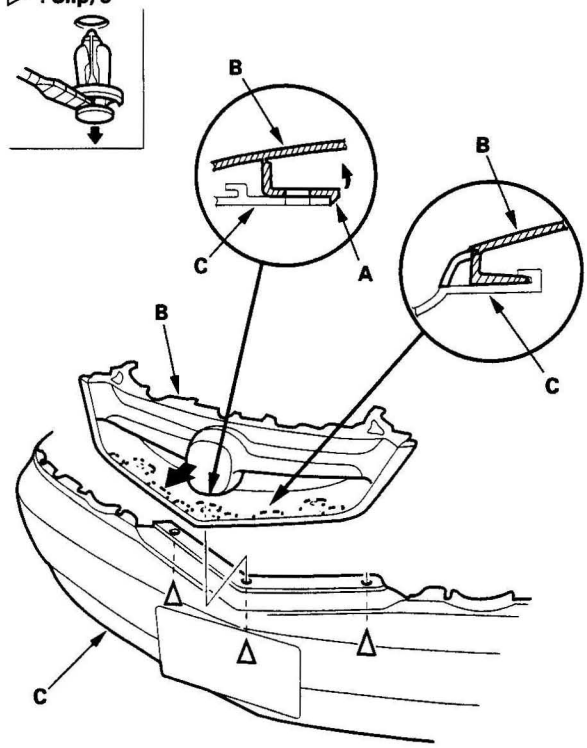
Protected by AR

'02-03 Models

1. Remove the front bumper (see page 20-103).
2. Remove the clips, and release the hooks (A) (three places), then remove the front grille (B) from the front bumper (C) by pulling it out. Take care not to scratch the front bumper.

Fastener Locations

▷ : Clip, 3



3. Install the grille in the reverse order of removal, and replace any damaged clips.

Protected by AR

Front Grille Disassembly/Reassembly

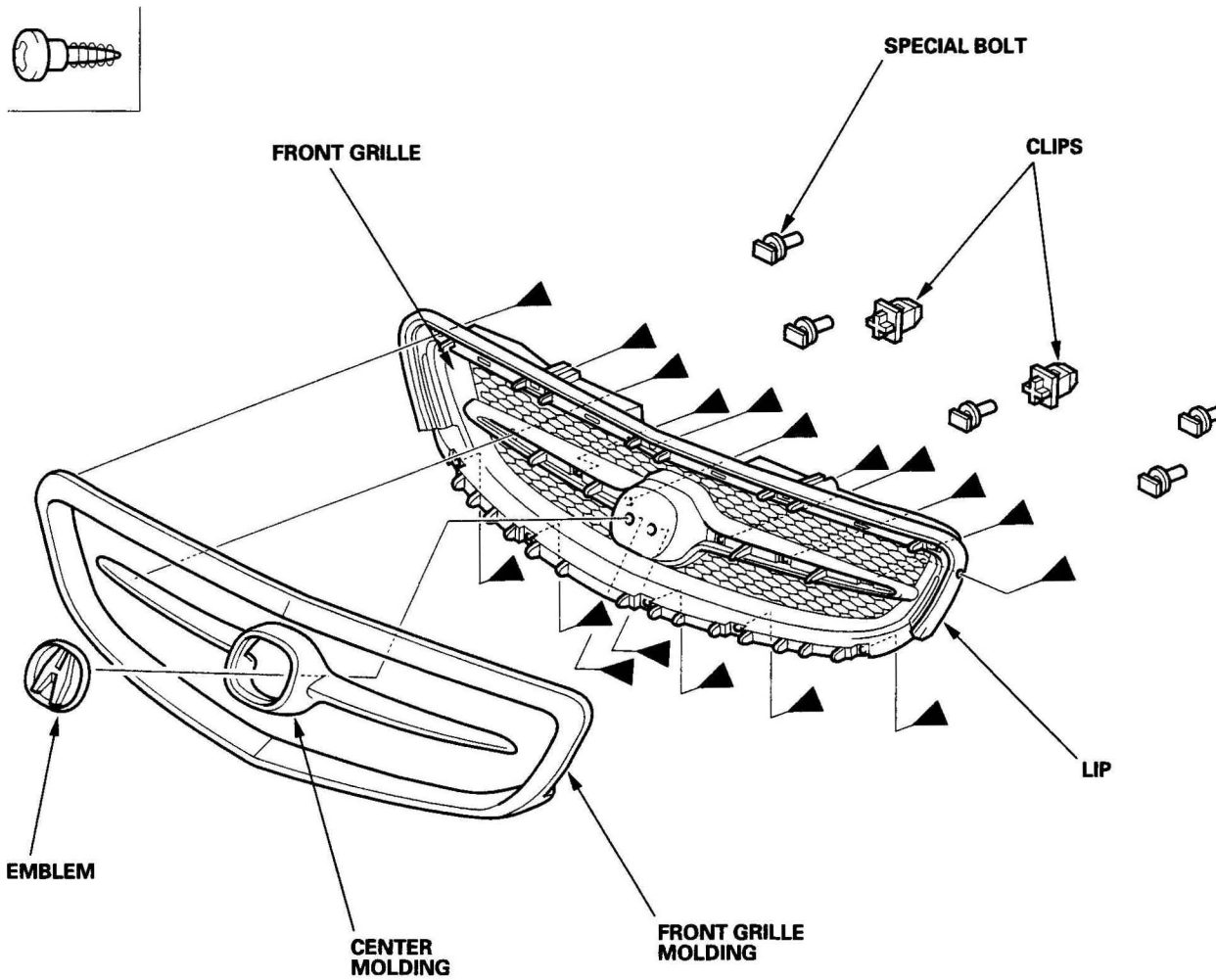
'99-01 Models

NOTE:
- Take care not to scratch the front grille and molding.
- Take care not to damage the lip. If the lip is damaged, replace the front grille and lip as an assembly.

1. Disassemble the front grille as shown.
2. Reassemble the grille in the reverse order of disassembly.

Fastener Locations

▶ : Screw, 18



BACK

Protected by AR

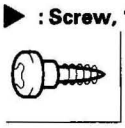
'02-03 Models

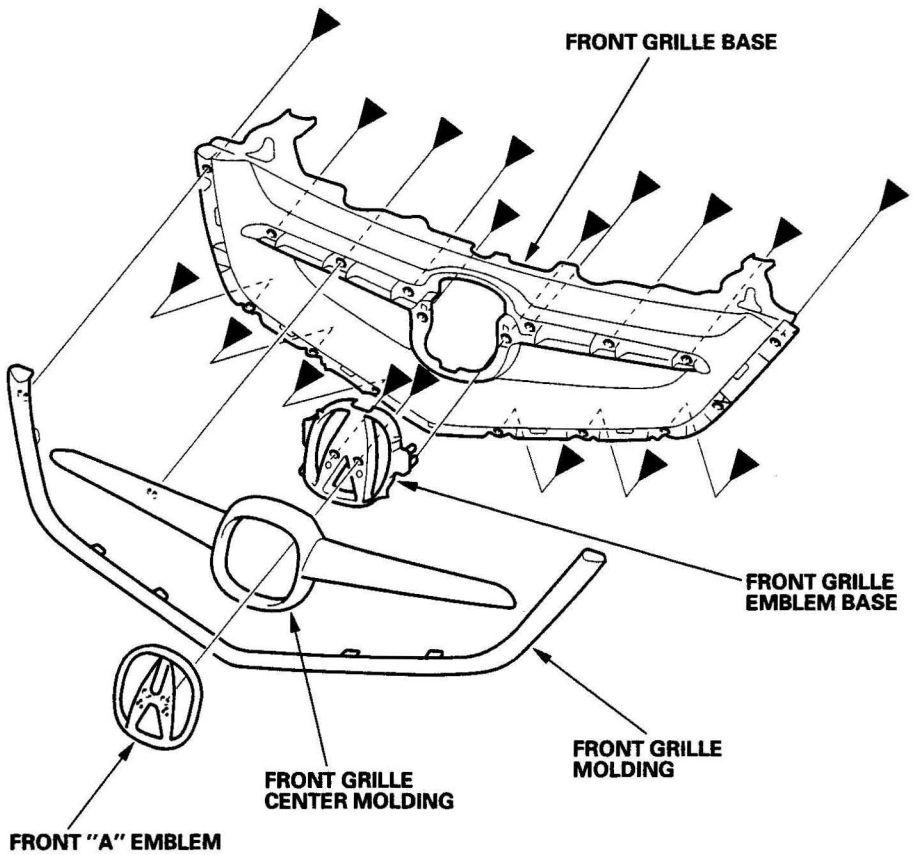
NOTE: Take care not to scratch the front grille and molding.

1. Disassemble the front grille as shown.
2. Reassemble the grille in the reverse order of disassembly.

Fastener Locations

▶ : Screw, 18





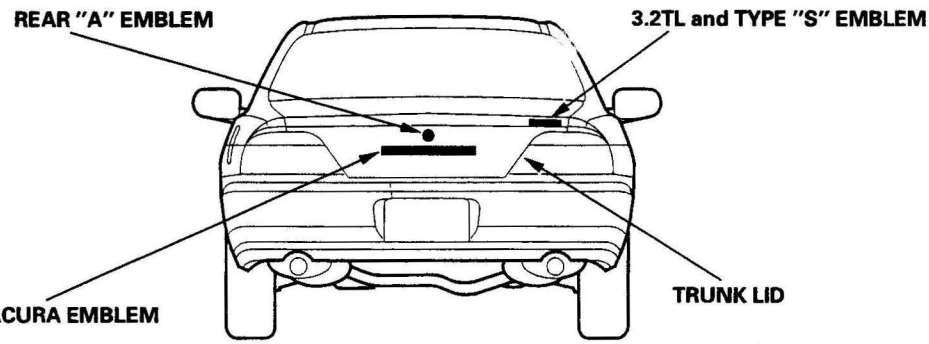
Protected by AR

Emblem Replacement

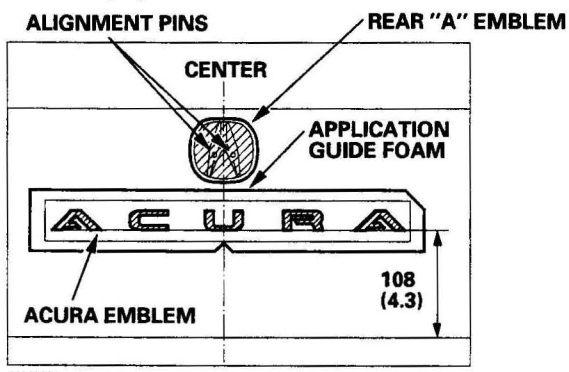
NOTE: When removing the emblems, take care not to scratch the trunk lid.

Apply the emblem where shown, and note these items:

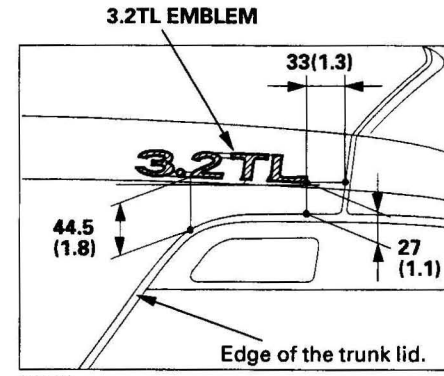
- Clean the trunk lid surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease, and water off the surface.



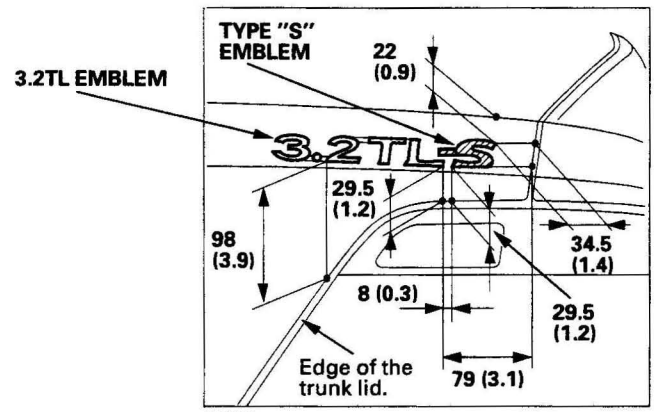
Unit: mm (in.)



: Adhesive tapes
REAR "A" EMBLEM (3M4213E, or equivalent)
ACURA EMBLEM (NITTO 500, or equivalent)



: Adhesive tape (3M 4213, or equiralent)



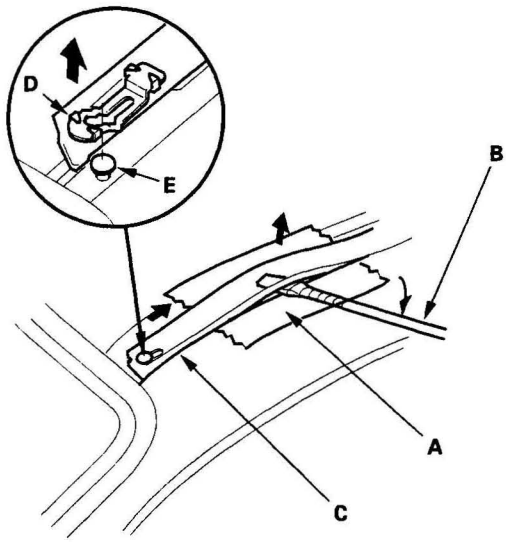
: Adhesive tape (3M 4213, or equicalent)

BACK

Protected by AR

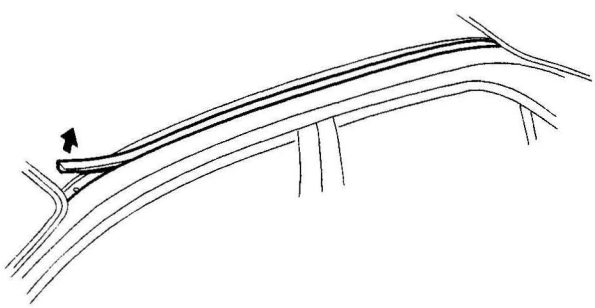
Roof Molding Replacement

1. Apply protective tape to the body (A). Using a flat-tip screwdriver wrapped with protective tape (B), pry up on the roof molding (C). Take care not to scratch the body.

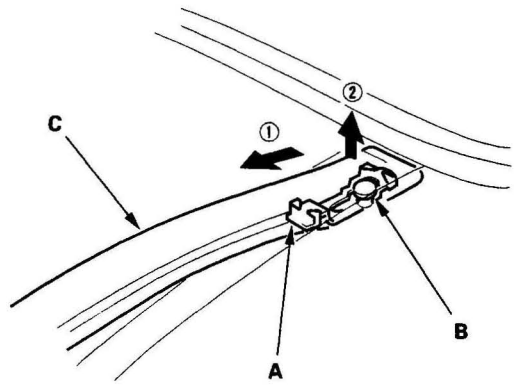


2. Pull up and slide the roof molding to release the front bracket (D) from the pin (E).

3. Pull up the front portion of roof molding.

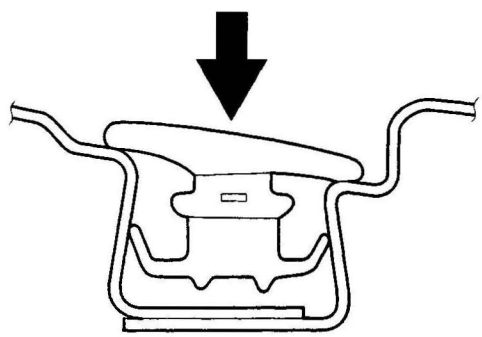


4. Pull up and release the rear bracket (A) from the pin (B), then remove the roof molding (C).



5. Install the molding in the reverse order of removal, and note these items:

   - Take care not to damage the windshield and rear window moldings.
   - Make sure the roof molding is installed securely.



BACK

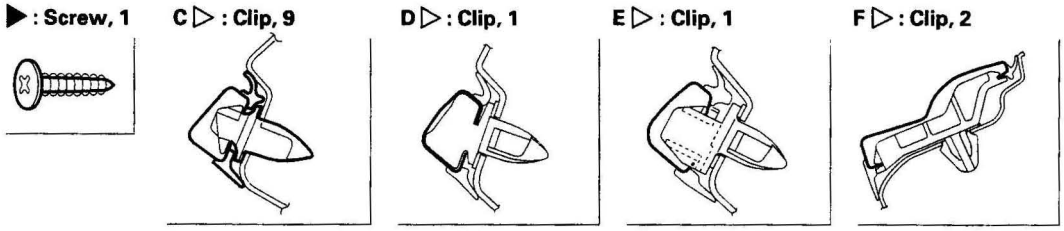
Protected by AR

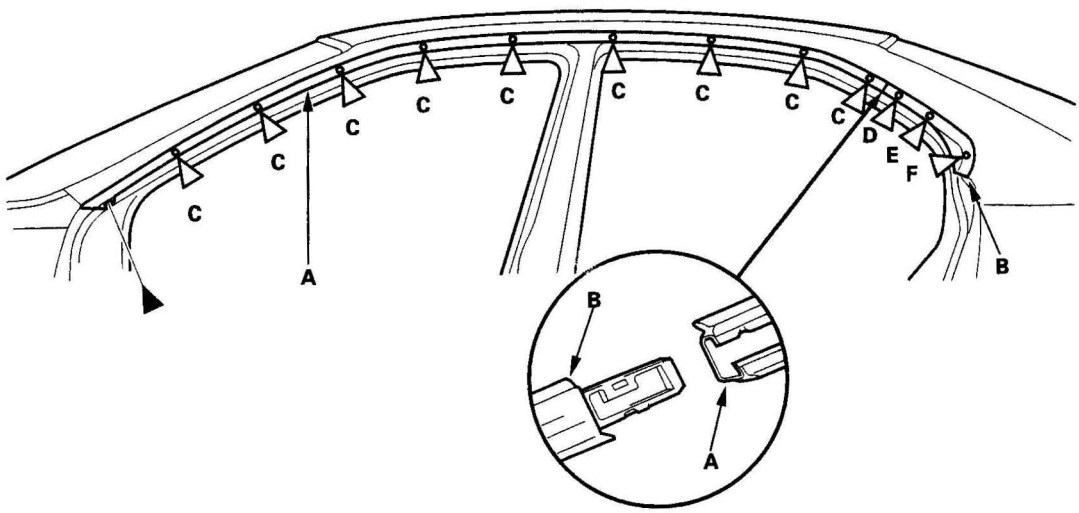
Roof Drip and Rear Pillar Moldings Replacement

NOTE: Put on gloves to protect your hands.

1. Remove the screw from the front edge of the roof drip molding. Detach the moldings from each clip, then remove the roof drip molding (A) and rear pillar molding (B) as an assembly. Take care not to scratch the body.

Fastener Locations

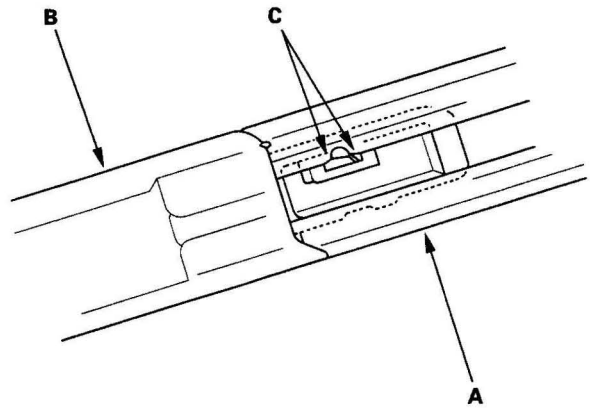




2. Separate the roof drip molding and rear pillar molding.

3. Install the moldings in the reverse order of removal, and note these items:

   - After joining the rear pillar molding (B) with the roof drip molding (A), lightly tap the locking tabs (C).
   - Replace any damaged clips.



BACK

Protected by AR

Fender/Door Moldings Replacement

NOTE:
- Wrap the blade of your putty knife or flat-tip screwdriver with protective tape to prevent damage to the door.
- Be careful not to pry too far or you may bend the molding.
- Put on gloves to protect your hands.

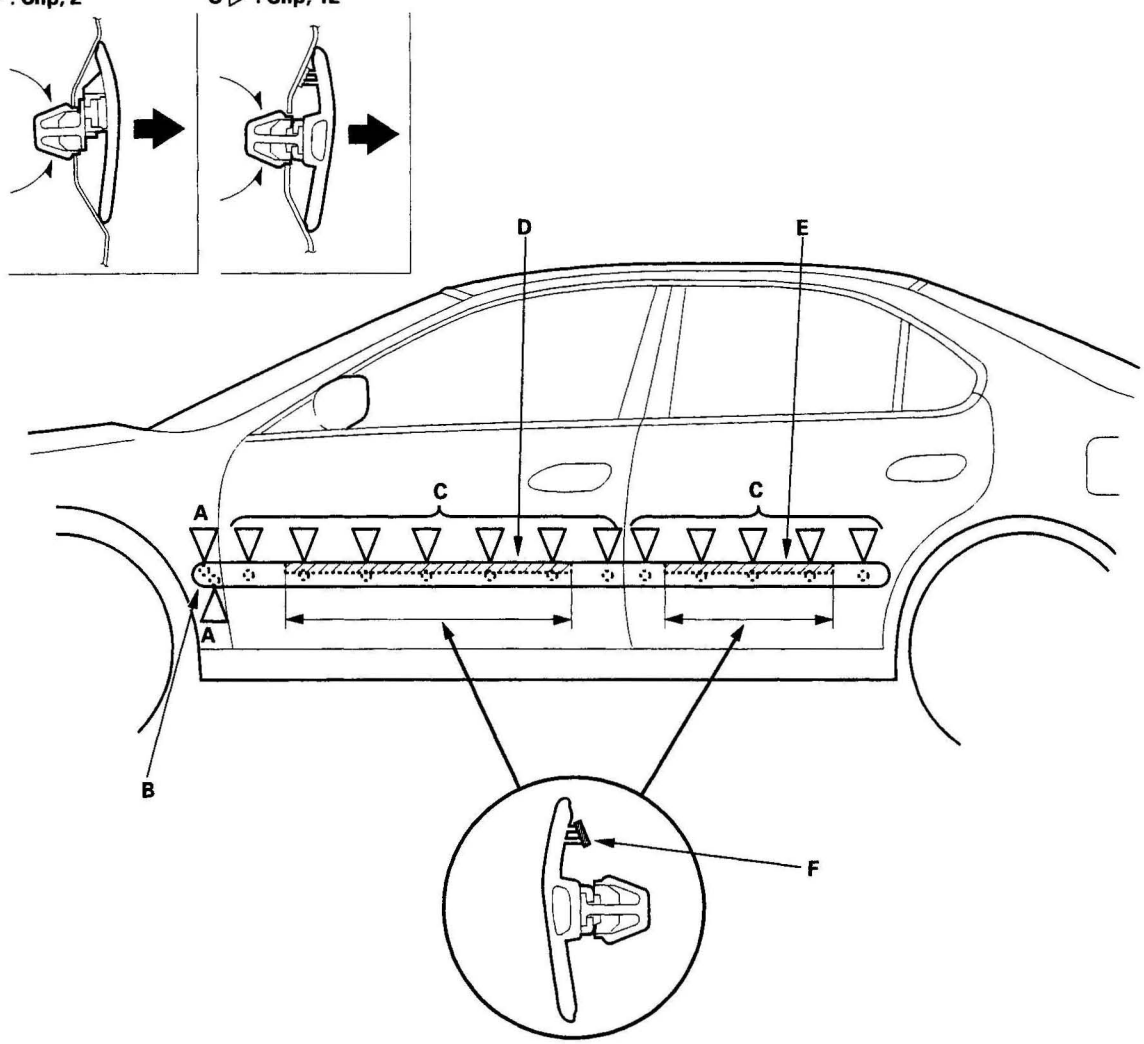
1. Prepare to release the molding clips from inside the vehicle.

   - To remove the front fender molding, remove the inner fender (see page 20-129).
   - To remove the front door molding, remove the front door panel (see page 20-6) and plastic cover.
   - To remove the rear door molding, remove the rear door panel (see page 20-12) and plastic cover.

2. Release the clips (A), then remove the front fender molding (B). Release the clips (C) and gently pry the front door molding (D) or rear door molding (E) away from the door while removing the adhesive tape (F) (3M 4212, or equivalent).

Fastener Locations

A ▷ : Clip, 2 C ▷ : Clip, 12



3. Install the moldings in the reverse order of removal, and replace any damaged clips and adhesive tape.

BACK

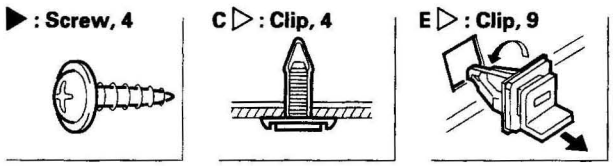
Protected by AR

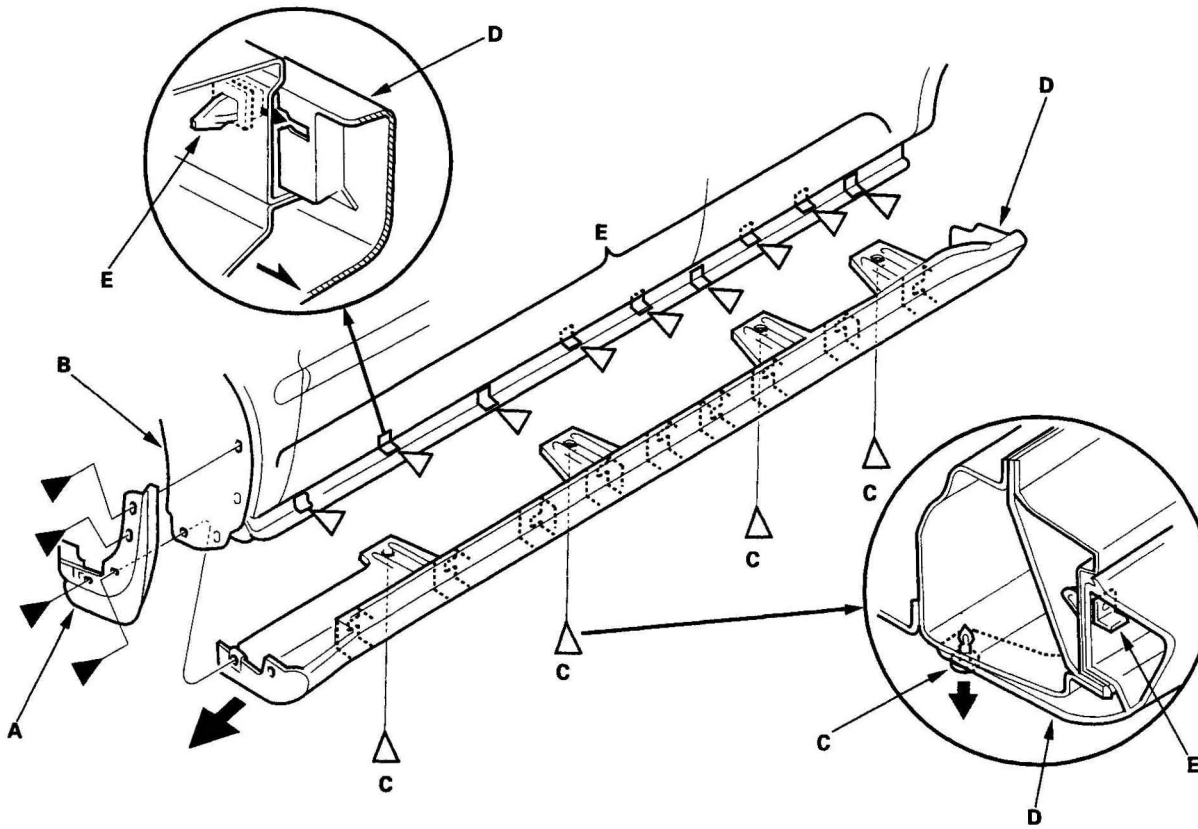
Side Sill Panel Replacement

1. Remove the side sill panel.

   –1 If equipped, remove the splash guard (A).
   –2 Pull the inner fender (B) back as necessary, and remove the expansion clips (C).
   –3 Slide the side sill panel (D) forward and remove it. Side clips (E) will stay in the body.
   –4 Remove the side clips from the body.

Fastener Locations





2. Replace any damaged clips.

3. Install the side clips on the side sill panel.

4. Hold the panel up, and fit all the side clips into the holes in the body, then push on the panel until the clips snap into place.

5. Install all the expansion clips.

6. Install the inner fender and splash guard (if equipped).

BACK

Protected by AR

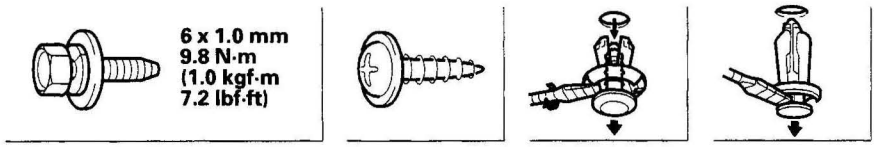
Inner Fender Replacement

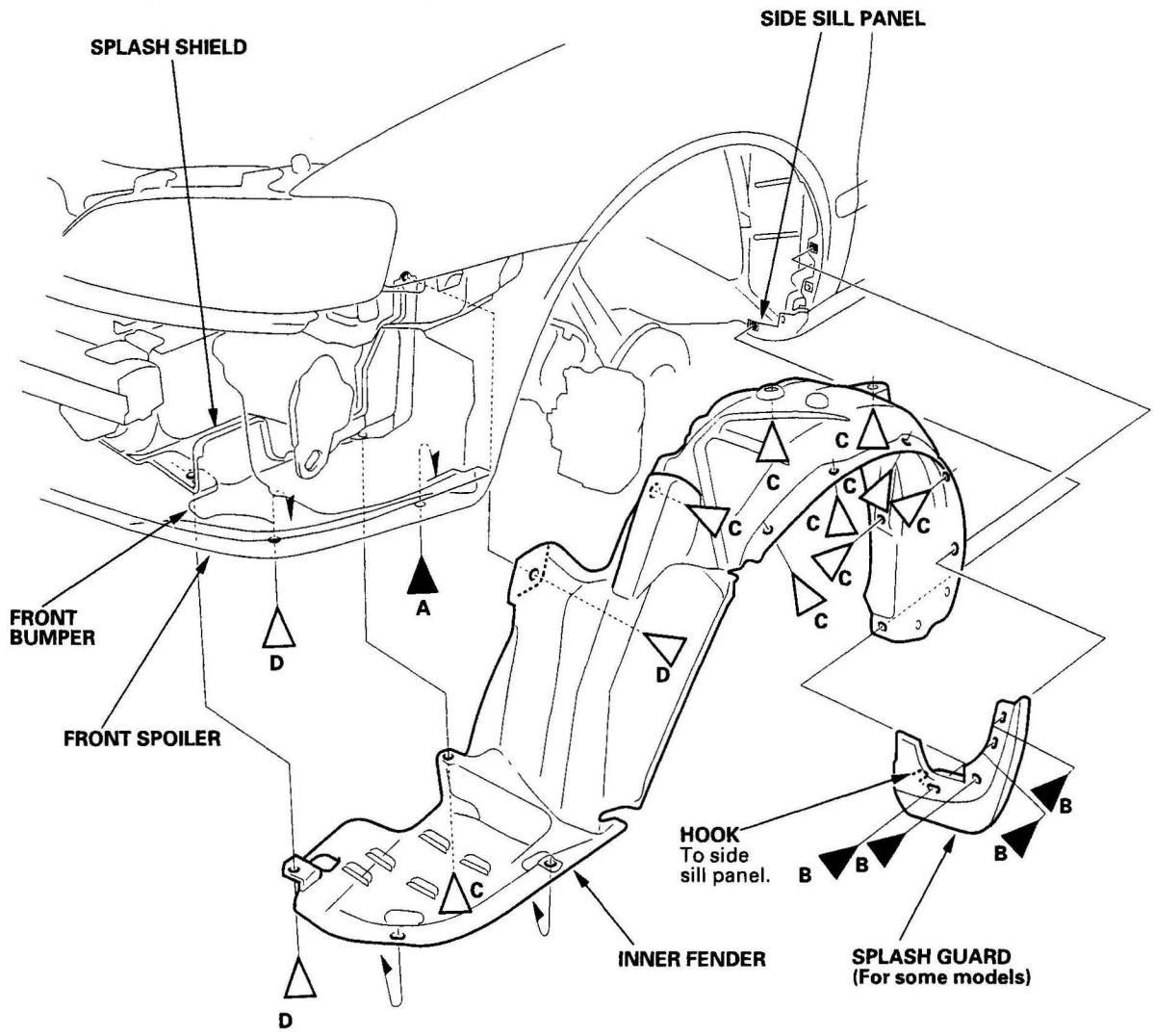
NOTE: Take care not to scratch the body.

1. Remove the inner fender as shown.
2. Install the inner fender in the reverse order of removal, and replace any damaged clips.

Fastener Locations

A ▶ : Bolt, 1 B ▶ : Screw, 4 C ▷ : Clip, 9 D ▷ : Clip, 3





BACK

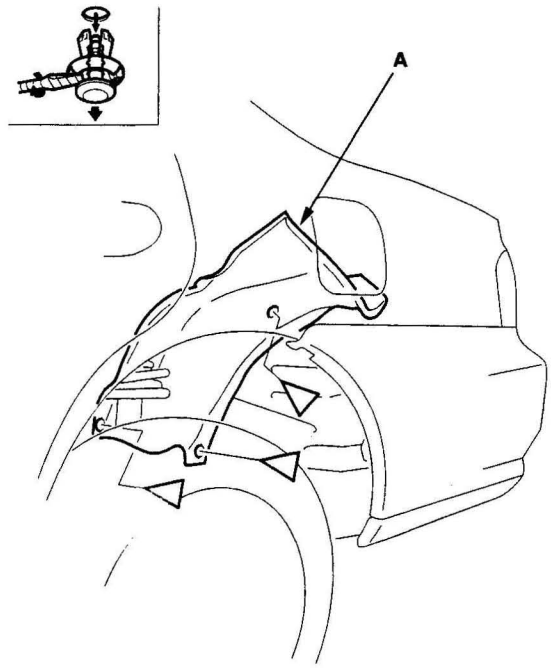
Protected by AR

Fuel Pipe Protector Replacement

1. Remove the clips, then remove the fuel pipe protector (A). Take care not to scratch the body.

Fastener Locations

▷ : Clip, 3



2. Install the protector in the reverse order of removal, and replace any damaged clips.

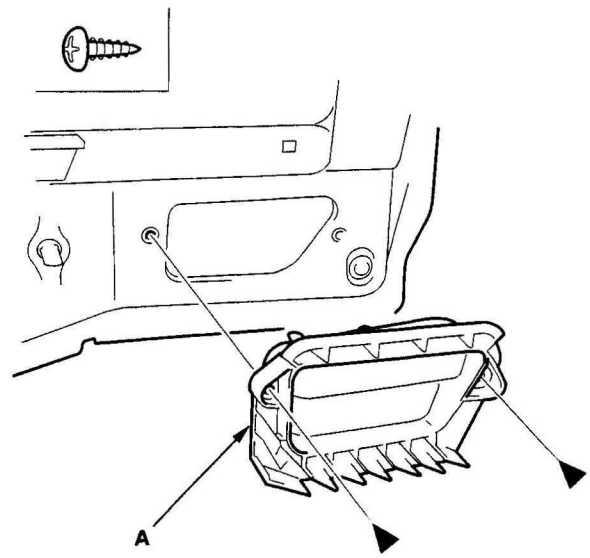
Rear Air Outlet Replacement

1. Remove the rear bumper (see page 20-106).

2. Remove the screws, then remove the rear air outlet (A). Take care not to scratch the body.

Fastener Locations

▶ : Screw, 2

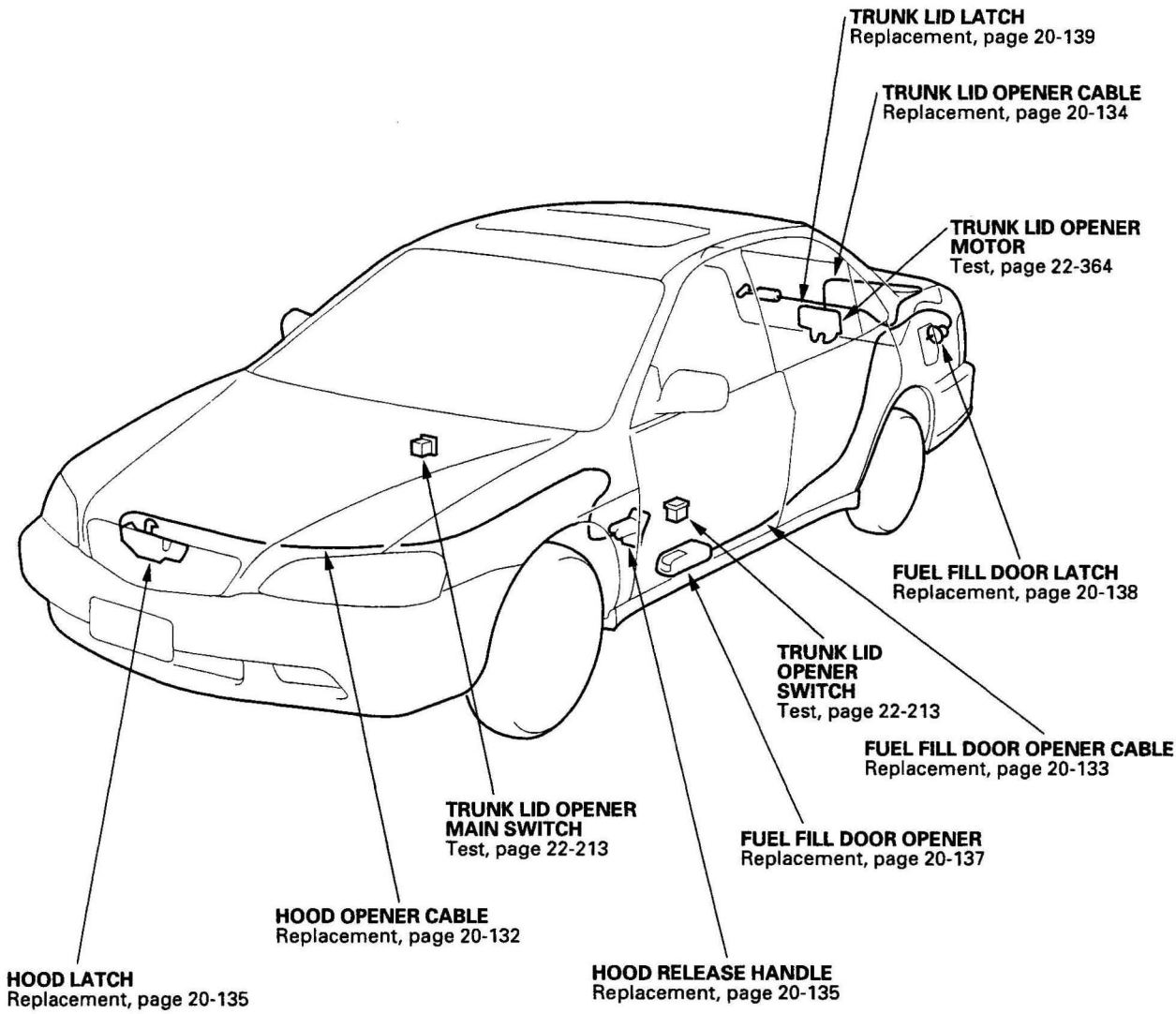


3. Install the outlet in the reverse order of removal.

BACK

Protected by AR

Component Location Index



Protected by AR

Hood Opener Cable Replacement

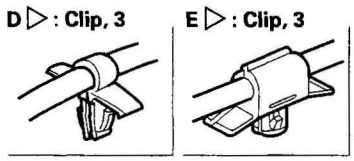
1. Remove these items:

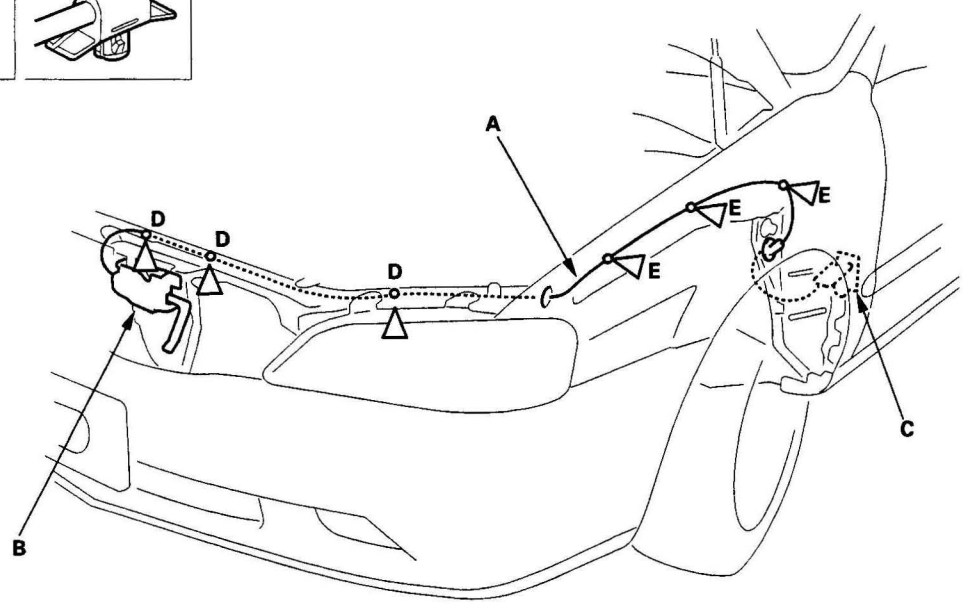
   - Front bulkhead cover, '99-01 models (see step 1 on page 20-135), '02-03 models (see page 20-103).
   - Front bumper, '02-03 models (see page 20-103).
   - Hood hinge cover, '02-03 models (see step 2 on page 20-136).
   - Inner fender, left side (see page 20-129)
   - Kick panel, left side (see page 20-55)

2. Disconnect the hood opener cable (A) from the hood latch (B), '99-01 models (see page 20-135), '02-03 models (see page 20-136), and hood release handle (C) (see page 20-135).

   NOTE: '99-01 models are shown. '02-03 models are similar except the front bumper should be removed before replacing the hood opener cable.

Fastener Locations





3. Using a clip remover, detach the clips (D, E) from the body, then remove the hood opener cable from the vehicle. Take care not to bend the cable.

4. Install the cable in the reverse order of removal, and replace any damaged clips.

BACK

Protected by AR

Fuel Fill Door Opener Cable Replacement

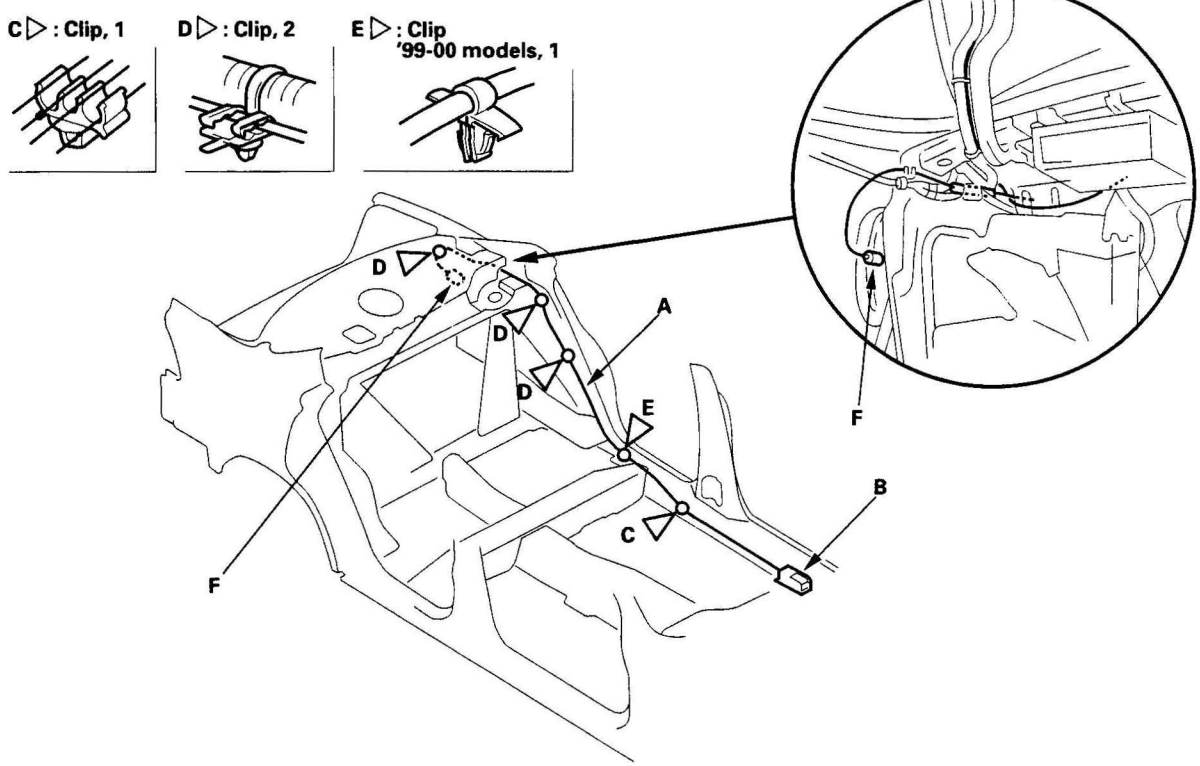
1. Remove these items:

   - Rear seat cushion and rear seat-back (see page 20-95)
   - Left rear shelf, '99-01 models (see page 20-56), '02-03 models (see page 20-57)
   - Left seat side trim, '99-01 models (see page 20-56), '02-03 models (see page 20-57)
   - Center pillar lower trim panel, left side (see page 20-55)
   - Trunk side trim panel, left side (see page 20-58)

2. Pull the carpet back as necessary (see page 20-61).

3. Disconnect the fuel fill door opener cable (A) from the opener (B) (see step 2 on page 20-138).

Fastener Locations



4. Release the opener cable from the clips (C, D), and on '99-00 models, use a clip remover to detach the clip (E). Then remove the fuel fill door latch (F).

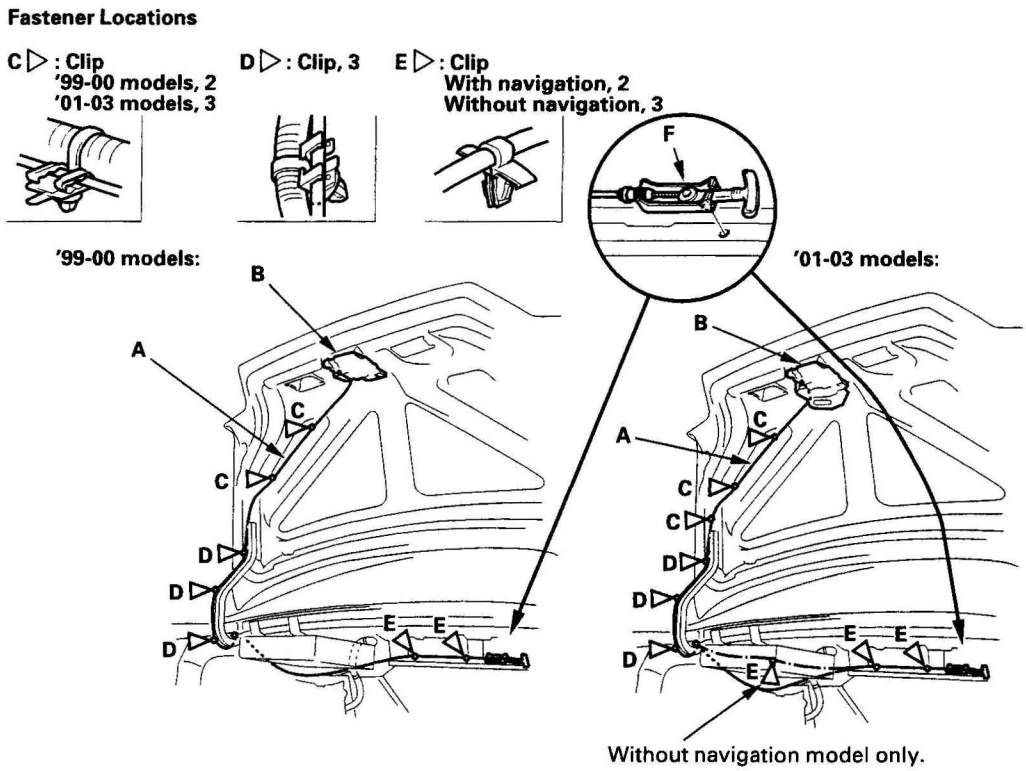
5. Remove the fuel fill door opener cable from the vehicle. Take care not to bend the cable.

6. Install the fuel fill door opener cable in the reverse order of removal, and replace any damaged clips.

Protected by AR

Trunk Lid Opener Cable Replacement

1. Remove these items:
   - Trunk lid trim (see page 20-114)
   - Trunk side trim panel, left side (see page 20-58)
2. Disconnect the trunk lid opener cable (A) from the trunk lid latch (B) (see page 20-139).



3. Release the opener cable from the clips (C,D). Using a clip remover, detach the clips (E), then remove the cable bracket (F) from the body.
4. Remove the trunk lid opener cable from the vehicle. Take care not to bend the cable.
5. Install the cable in the reverse order of removal, and replace any damaged clips.

BACK

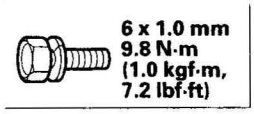
Protected by AR

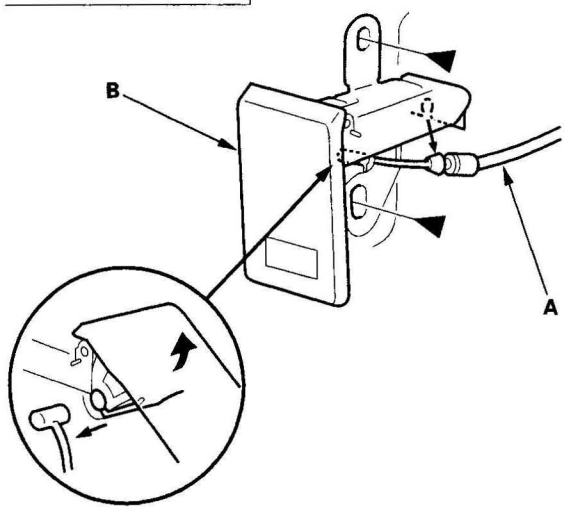
Hood Release Handle Replacement

1. Remove the left kick panel (see page 20-55).
2. Disconnect the hood opener cable (A) from the hood release handle (B). Take care not to bend the cable.

Fastener Locations

▶ : Bolt, 2





3. Remove the bolts, then remove the hood release handle.
4. Install the handle in the reverse order of removal, and note these items:
   - Make sure the hood opener cable is connected properly.
   - Make sure the hood opens properly.

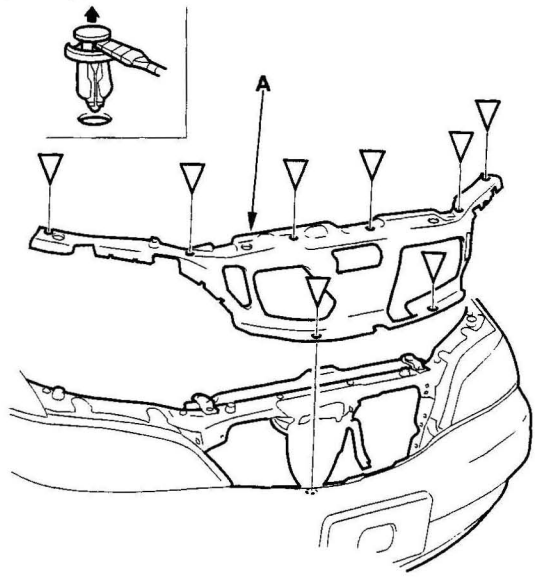
Hood Latch Replacement

'99-01 Models

1. Detach the clips, then remove the front bulkhead cover (A). Take care not to scratch the cover.

Fastener Locations

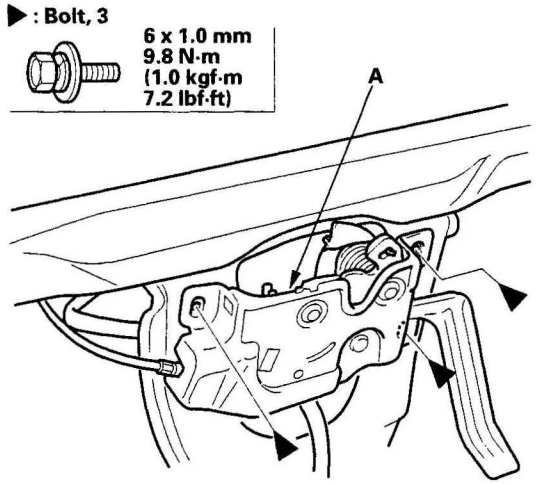
▷ : Clip, 8



2. Remove the bolts, then remove the hood latch (A) from the body.

Fastener Locations

▶ : Bolt, 3



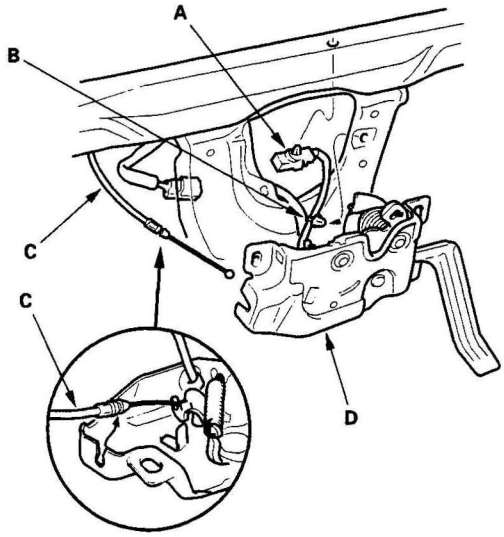
(cont'd)

BACK

Protected by AR

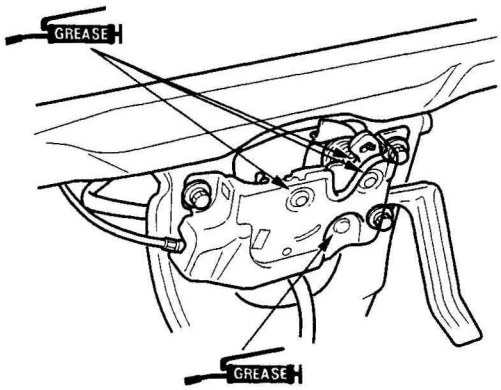
Hood Latch Replacement (cont'd)

3. Detach the hood latch switch connector (A) and harness clip (B) ('01 model) from the body. Disconnect the hood opener cable (C) from the hood latch (D), and disconnect the hood latch switch connector. Take care not to bend the cable.



4. Install the latch in the reverse order of removal, and note these items:

   - Grease each location of the hood latch indicated by the arrows.
   - Make sure the hood opener cable is connected properly and hood latch switch connector is plugged in properly.
   - Adjust the hood latch alignment (see step 4 on page 20-109).
   - Make sure the hood opens properly and locks securely.



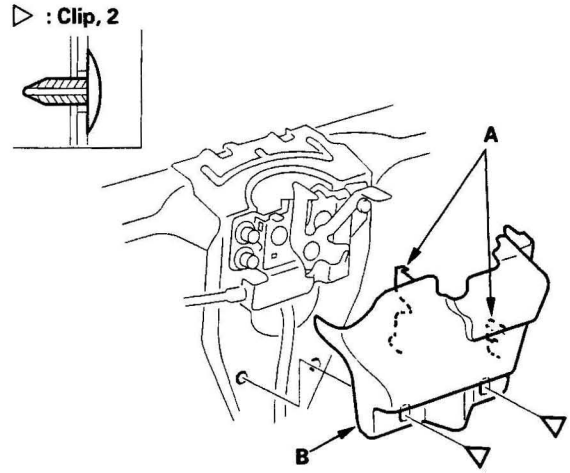
'02-03 Models

1. Remove the front bumper (see page 20-103).

2. Remove the clips, and release the hooks (A), then remove the hood latch cover (B).

Fastener Locations

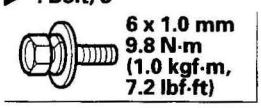
▷ : Clip, 2

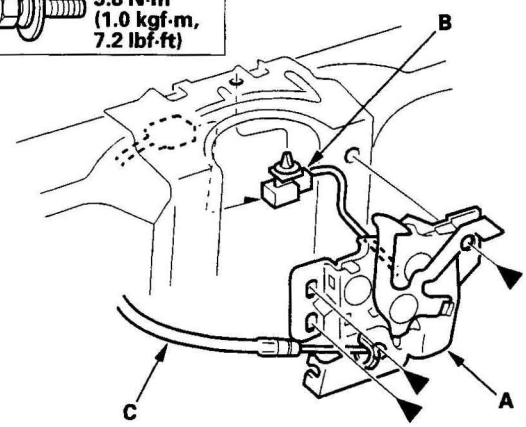


3. Remove the bolts, then remove the hood latch (A) from the body.

Fastener Locations

▶ : Bolt, 3





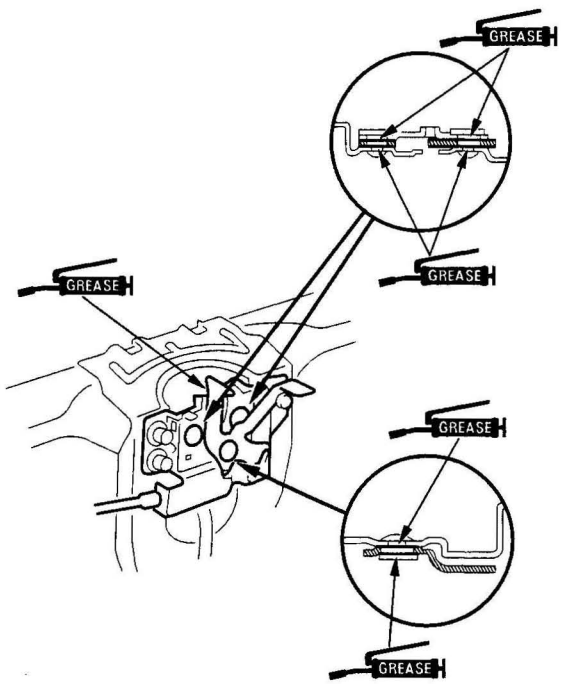
4. Detach the hood latch switch connector (B) from the body. Disconnect the hood opener cable (C) from the hood latch, and disconnect the hood latch switch connector. Take care not to bend the cable.

BACK

Protected by AR

5. Install the latch in the reverse order of removal, and note these items:

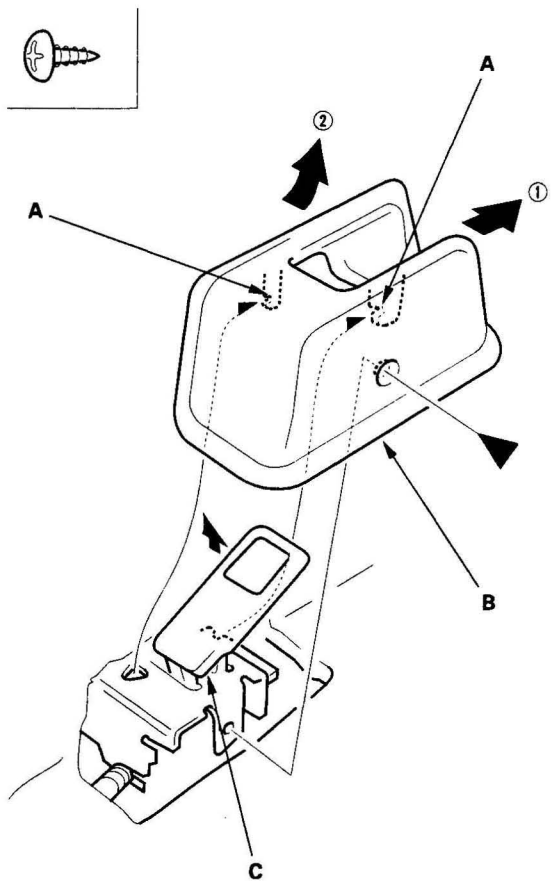
   - Grease the hood latch at each location indicated by the arrows.
   - Make sure the hood opener cable is connected properly and the hood latch switch connector is plugged in properly.
   - Adjust the hood latch alignment (see step 4 on page 20-111).
   - Make sure the hood opens properly and locks securely.



1. Remove the screw, and release the hooks (A) by sliding the opener cover (B) forward while pulling up the opener knob (C), then remove the opener cover.

Fastener Location

▶: Screw, 1



(cont'd)

BACK

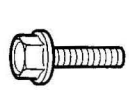
Protected by AR

Fuel Fill Door Opener Replacement (cont'd)

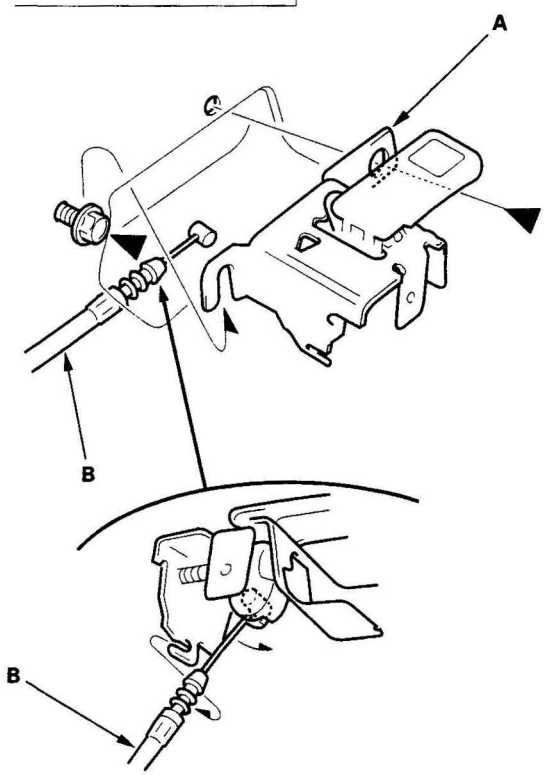
2. Loosen and remove the bolts, then remove the fuel fill door opener (A) from the body.

Fastener Locations

▶ : Bolt, 2



6 x 1.0 mm
9.8 N·m
(1.0 kgf·m,
7.2 lbf·ft)



3. Disconnect the fuel fill door opener cable (B), then remove the opener. Take care not to bend the cable

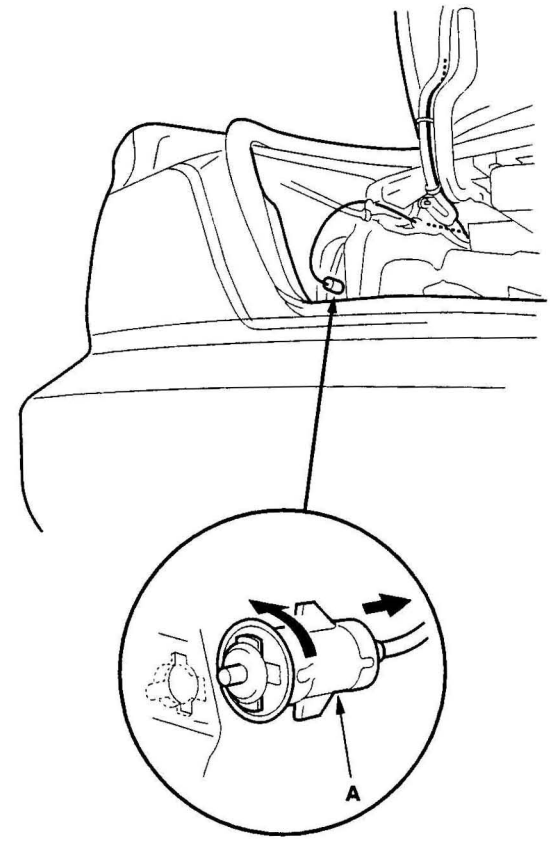
4. Install the cable in the reverse order of removal, and note these items:

- Make sure the opener cable is connected properly.
- Make sure the fuel fill door opens properly.

Fuel Fill Door Latch Replacement

1. Pull the rear edge of the left trunk side trim panel back (see page 20-58).

2. Turn the fuel fill door latch (A) 90°, and remove it.

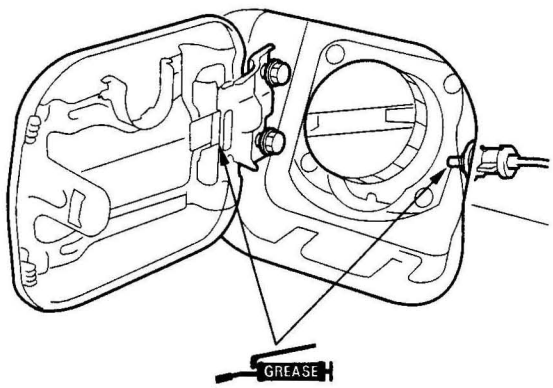


BACK

Protected by AR

3. Install the latch in the reverse order of removal, and note these items:

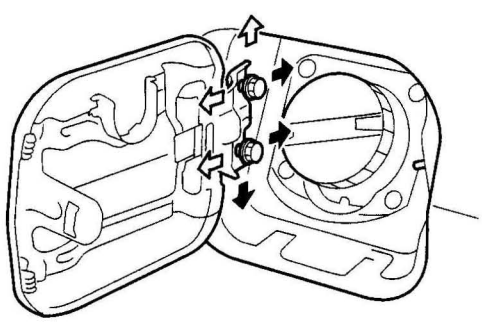
   - Grease each location indicated by the arrows.
   - Make sure the fuel fill door opens properly and locks securely.



4. Check that the fuel fill door fits flush against the body. If necessary, adjust it.

Fastener Locations

▶: Bolt, 2	6 x 1.0 mm 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



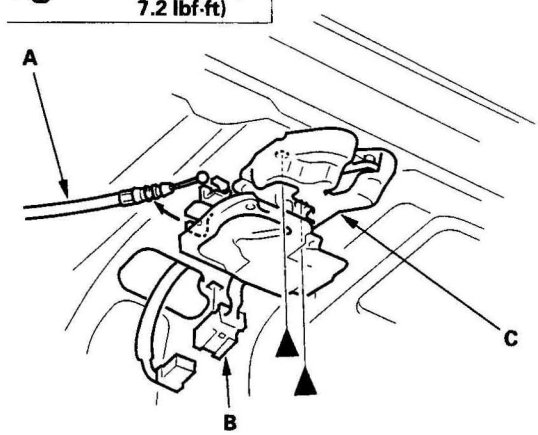
Trunk Lid Latch Replacement

1. Remove the trunk lid trim (see step 1 on page 20-114).

2. Disconnect the trunk lid opener cable (A) and trunk lid latch switch connector (B), and detach the trunk lid latch switch connector from the trunk lid. Take care not to bend the opener cable.

Fastener Locations

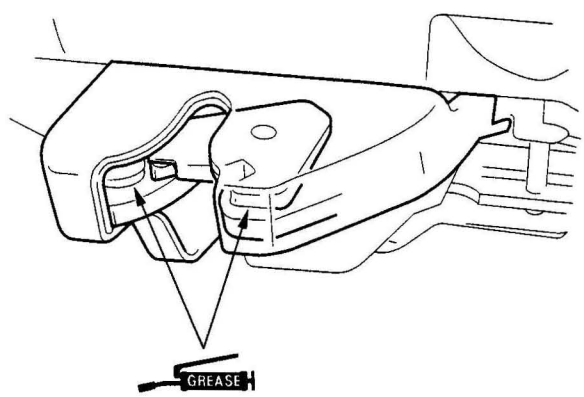
▶: Bolt, 2	6 x 1.0 mm 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



3. Remove the bolts, then remove the trunk lid latch (C).

4. Install the latch in the reverse order of removal, and note these items:

   - Grease the locations of the trunk lid latch indicated by the arrows.
   - Make sure the connector is plugged in properly and the opener cable is connected properly.
   - Make sure the trunk lid opens properly and locks securely.

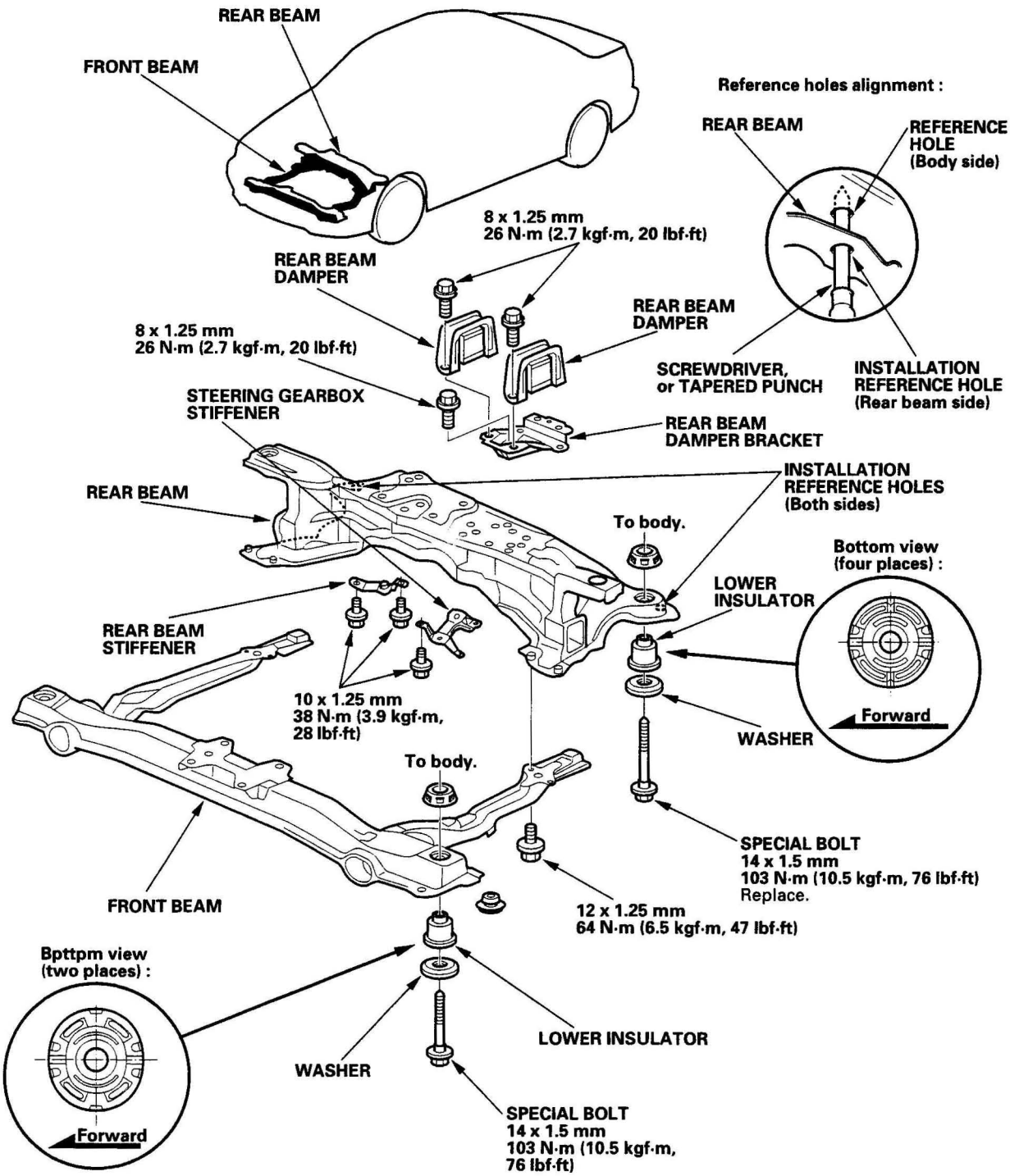


BACK

Protected by AR

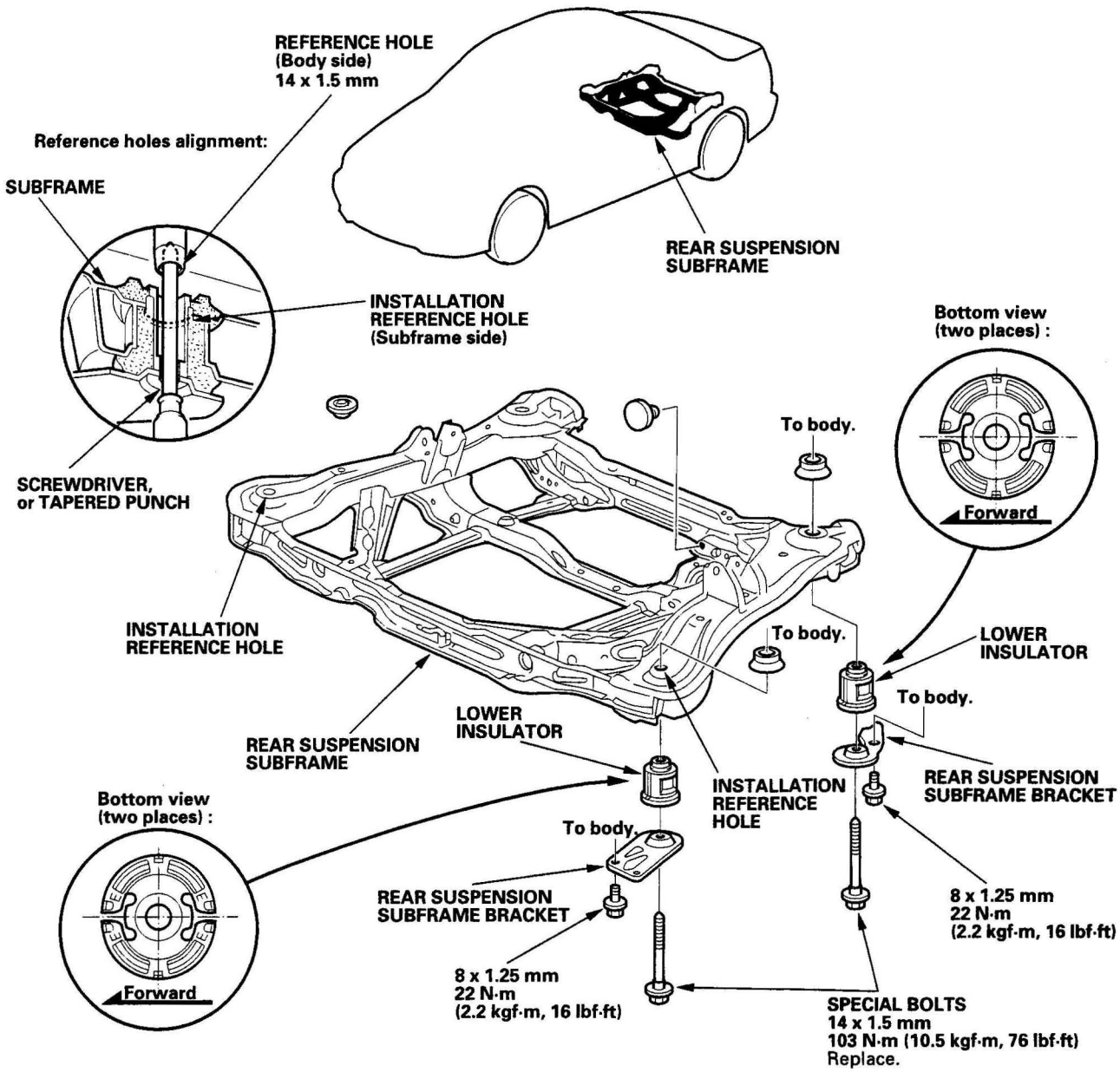
Subframe Replacement

After loosening the subframe mounting bolts, be sure to replace them with new ones.



BACK

Protected by AR



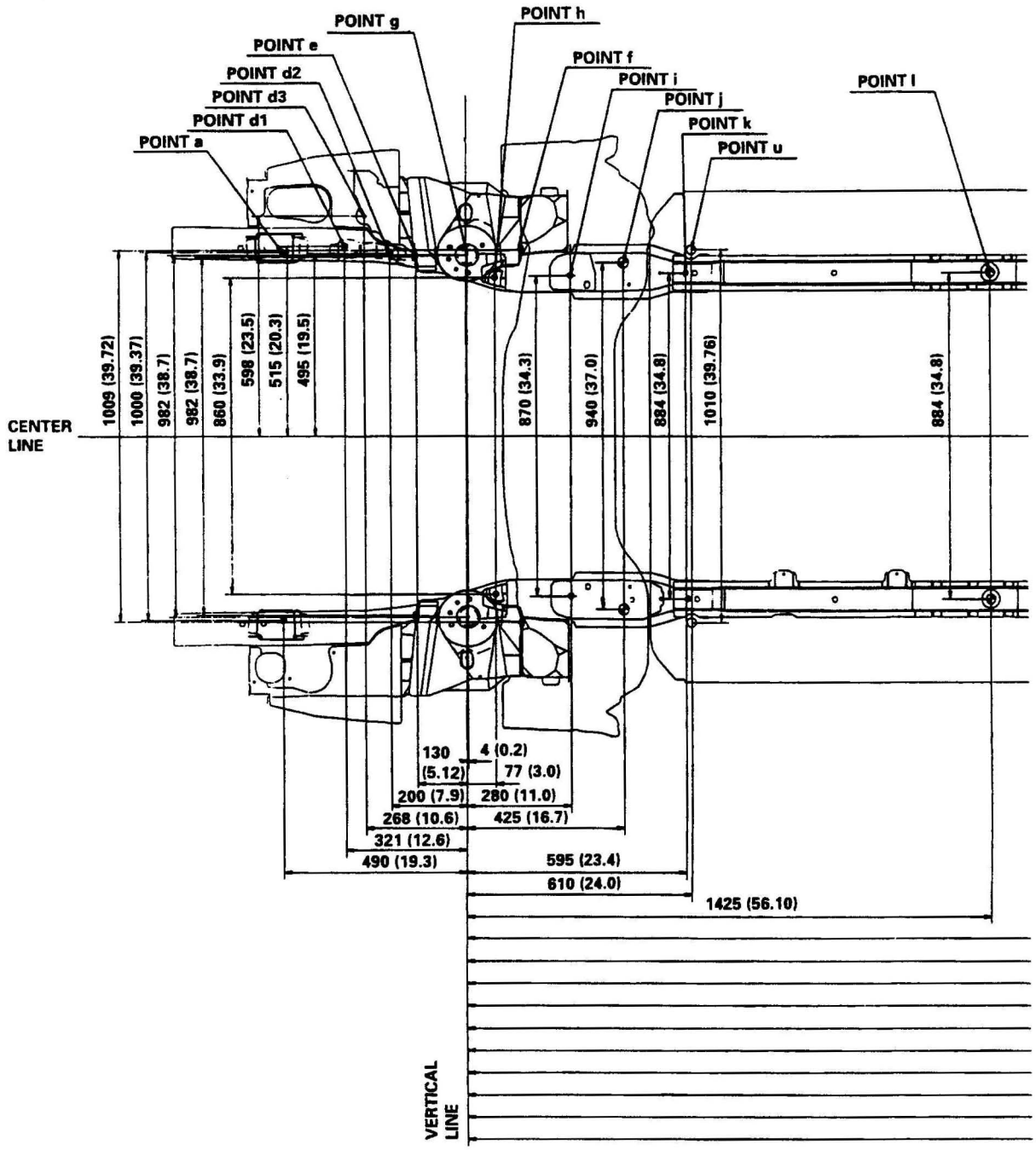
BACK

Protected by AR

Frame Repair Chart

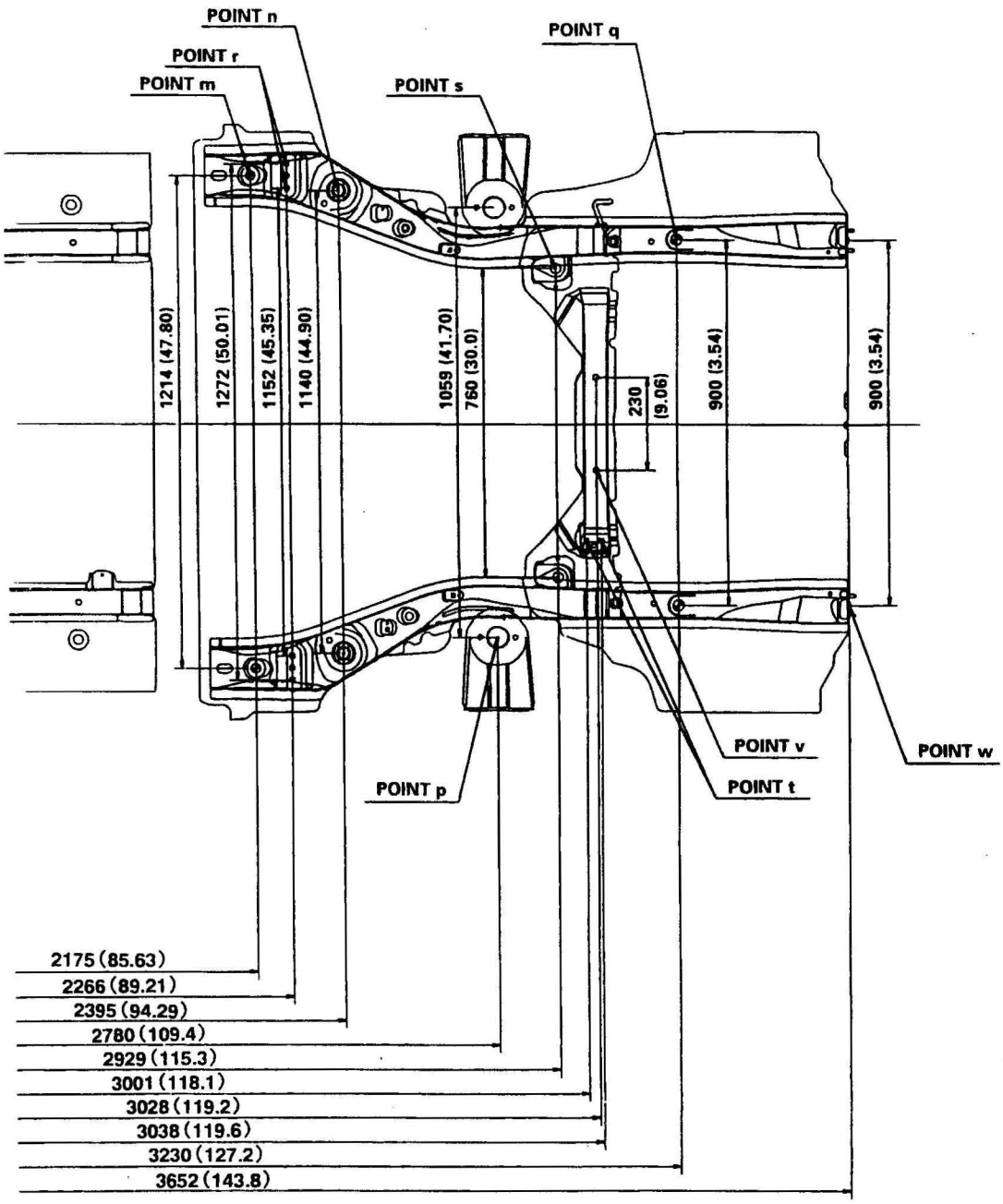
Top View:

Unit : mm (in.)
ø: Inner diameter



BACK

Protected by AR



(cont'd)

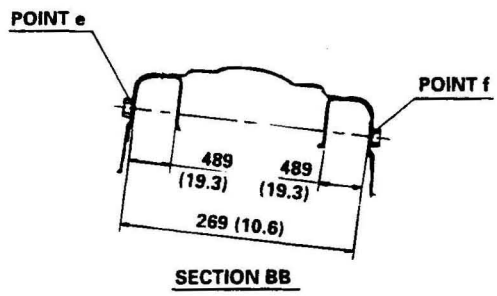
BACK

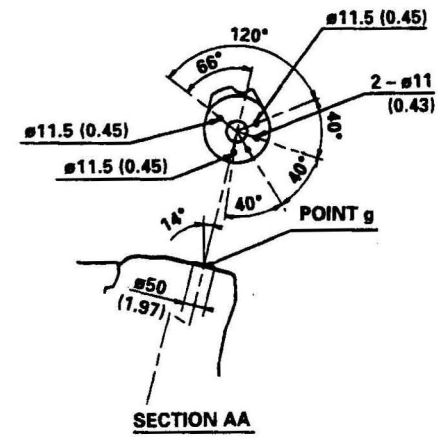
Protected by AR

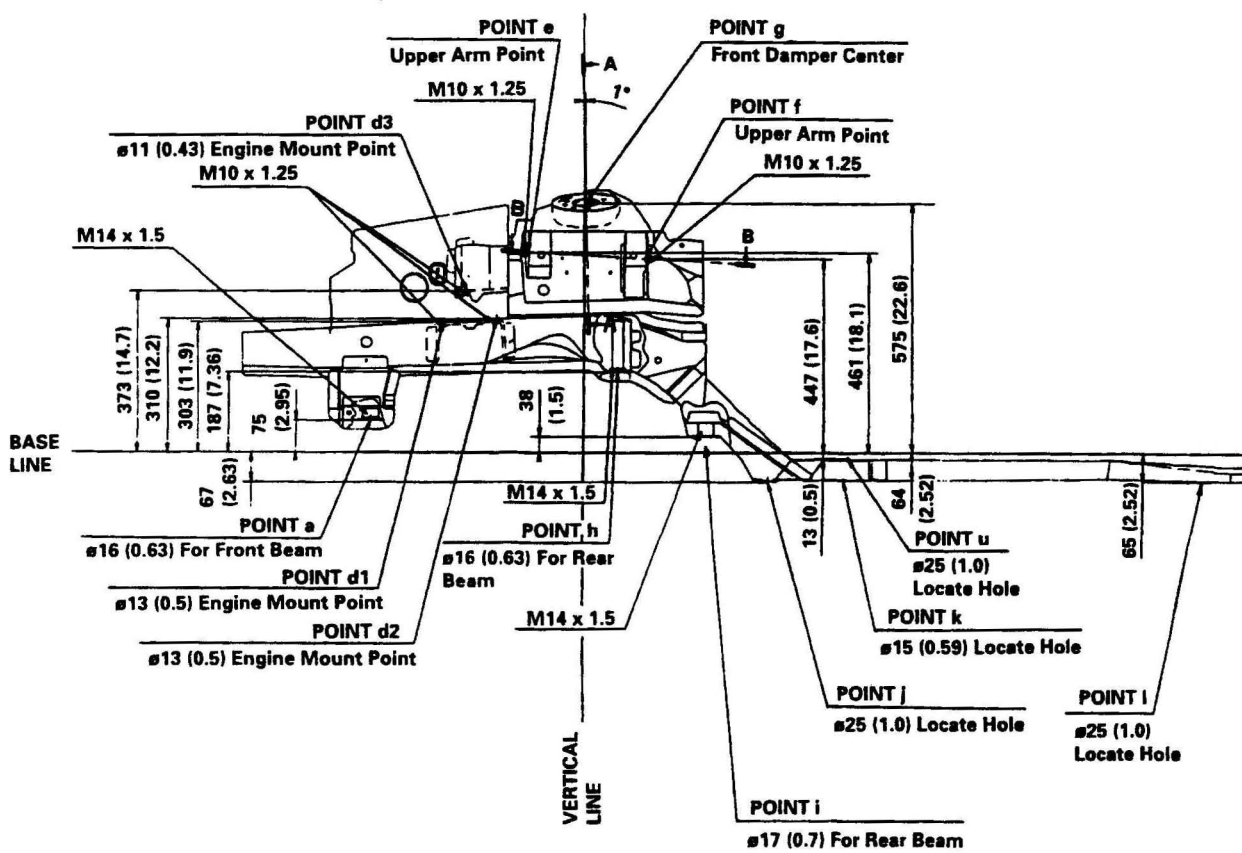
Frame Repair Chart (cont'd)

Side View:

Unit : mm (in.)
ø: Inner diameter

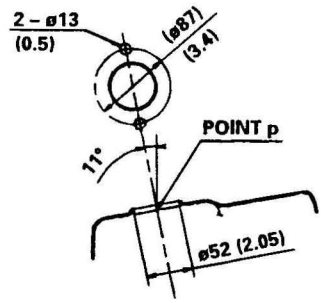




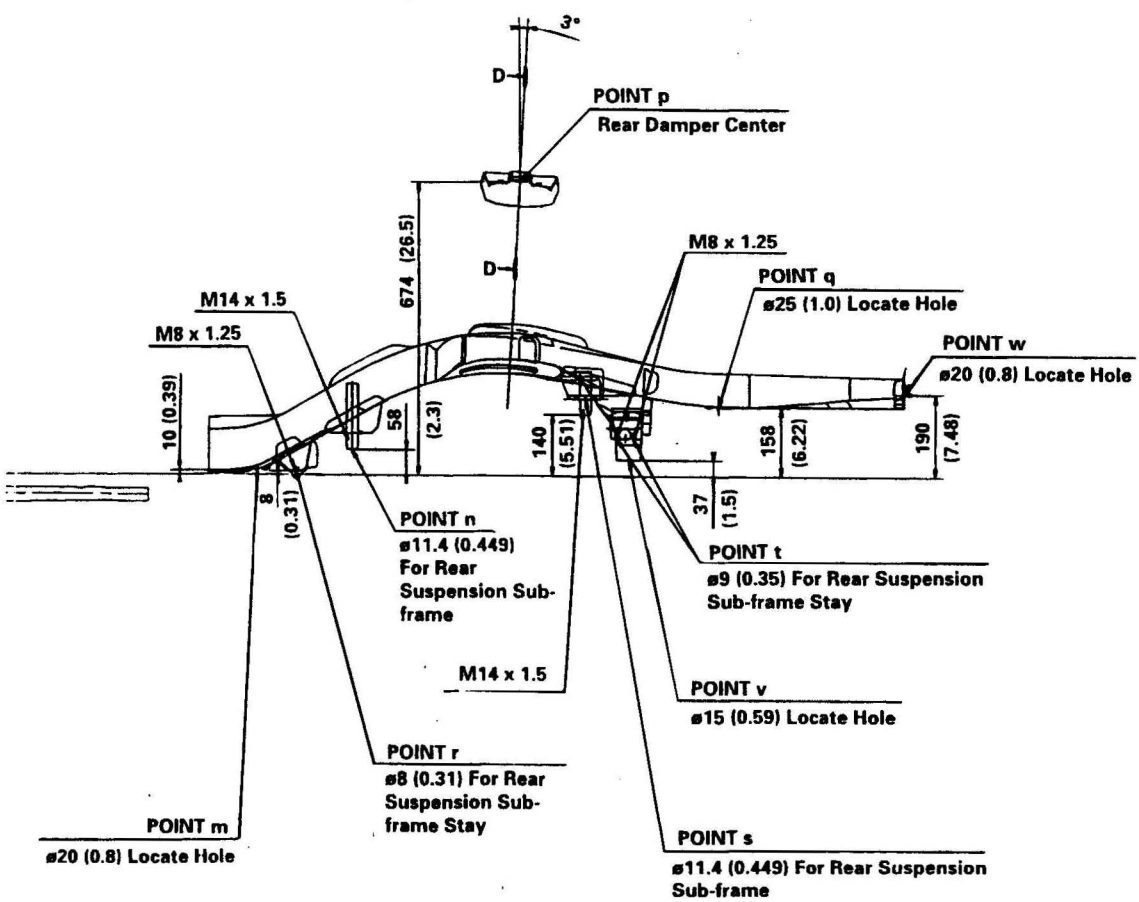


BACK

Protected by AR



SECTION DD



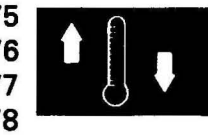
BACK

Protected by AR

HVAC (Heating, Ventilation, and Air Conditioning)

Climate Control

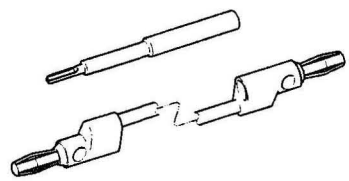
Special Tools 21-2
Component Location Index 21-3
A/C Service Tips and Precautions 21-6
A/C Refrigerant Oil Replacement 21-6
General Troubleshooting Infomation 21-8
DTC Troubleshooting Index 21-9
Symptom Troubleshooting Index 21-10
System Description 21-12
Circuit Diagram 21-16
DTC Troubleshooting 21-20
Recirculation Control Motor Circuit Troubleshooting 21-34
ECT Sensor Circuit Troubleshooting 21-35
Communication Line Circuit Troubleshooting 21-36
Climate Control Power and Ground Circuits Troubleshooting 21-37
Radiator and Condenser Fans Low Speed Circuit Troubleshooting 21-38
Condenser Fan High Speed Circuit Troubleshooting 21-41
Radiator and Condenser Fans High Speed Circuit Troubleshooting 21-42
Condenser Fan Circuit Troubleshooting 21-43
Radiator and Condenser Fans Common Circuit Troubleshooting 21-45
Compressor Clutch Circuit Troubleshooting 21-46
A/C Pressure Switch Circuit Troubleshooting 21-50
In-car Temperature Sensor Replacement and Test 21-53
Outside Air Temperature Sensor Replacement and Test 21-54
Sunlight Sensor Replacement and Test 21-55
Evaporator Temperature Sensor Test 21-56
Power Transistor Test 21-56
Air Mix Control Motor Test and Replacement 21-57
Mode Control Motor Test and Replacement 21-58
Recirculation Control Motor Test and Replacement 21-59
Climate Control Unit Removal and Installation 21-60
Climate Control Unit Bulb Replacement 21-61
Evaporator Removal and Installation 21-62
Evaporator Components Replacement 21-63
Dust and Pollen Filter Replacement 21-64
* Blower Unit Removal and Installation 21-65
Blower Unit Components Replacement 21-65
* Heater Unit/Core Replacement 21-66
Heater Valve Cable Adjustment 21-68
Compressor Replacement 21-69
Compressor Clutch Check 21-71
Compressor Clutch Overhaul 21-72
Compressor Relief Valve Replacement 21-73
Condenser Replacement 21-74
Refigerant Recovery 21-75
System Evacuation 21-76
System Charging 21-77
Refrigerant Leak Test 21-78
A/C System Tests 21-79



Protected by AR

Special Tools

Ref.No.	Tool Number	Description	Qty
①	07SAZ-001000A	Backprobe Set	2

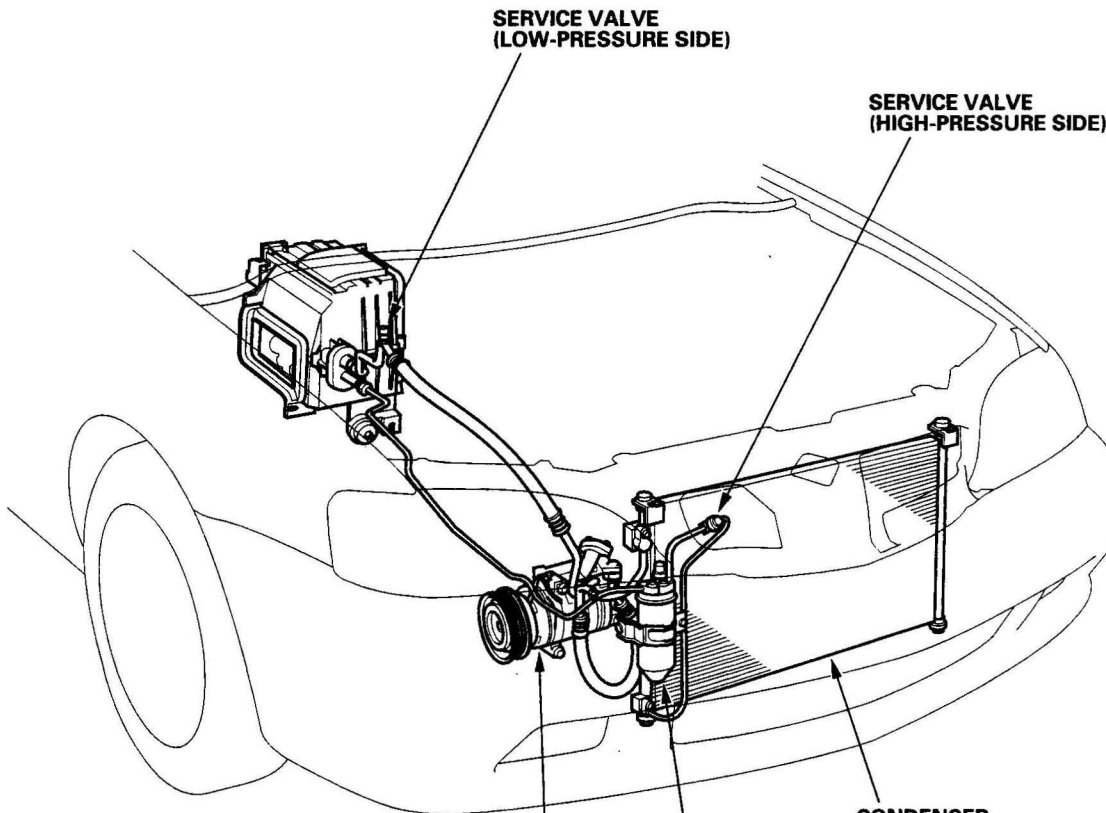


①

BACK

Protected by AR

Component Location Index

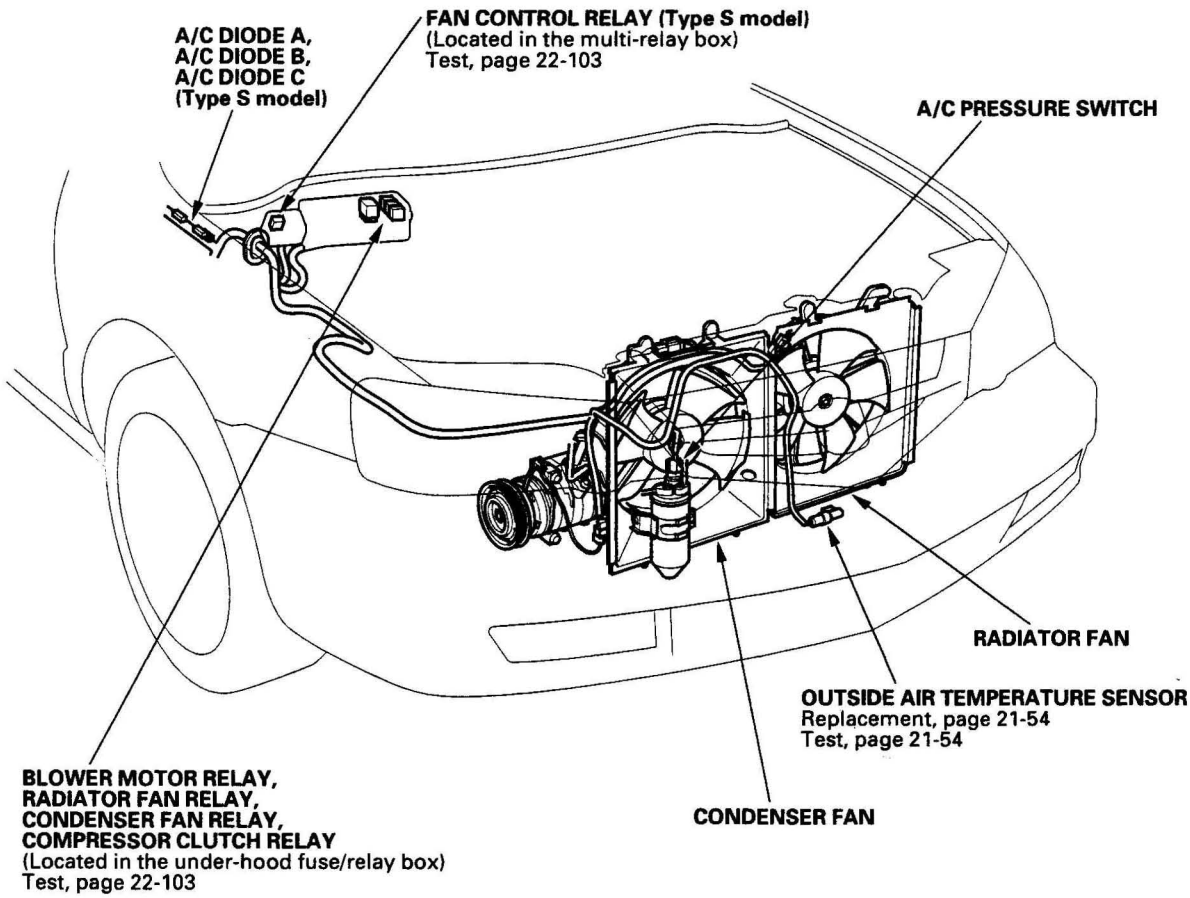


(cont'd)

BACK

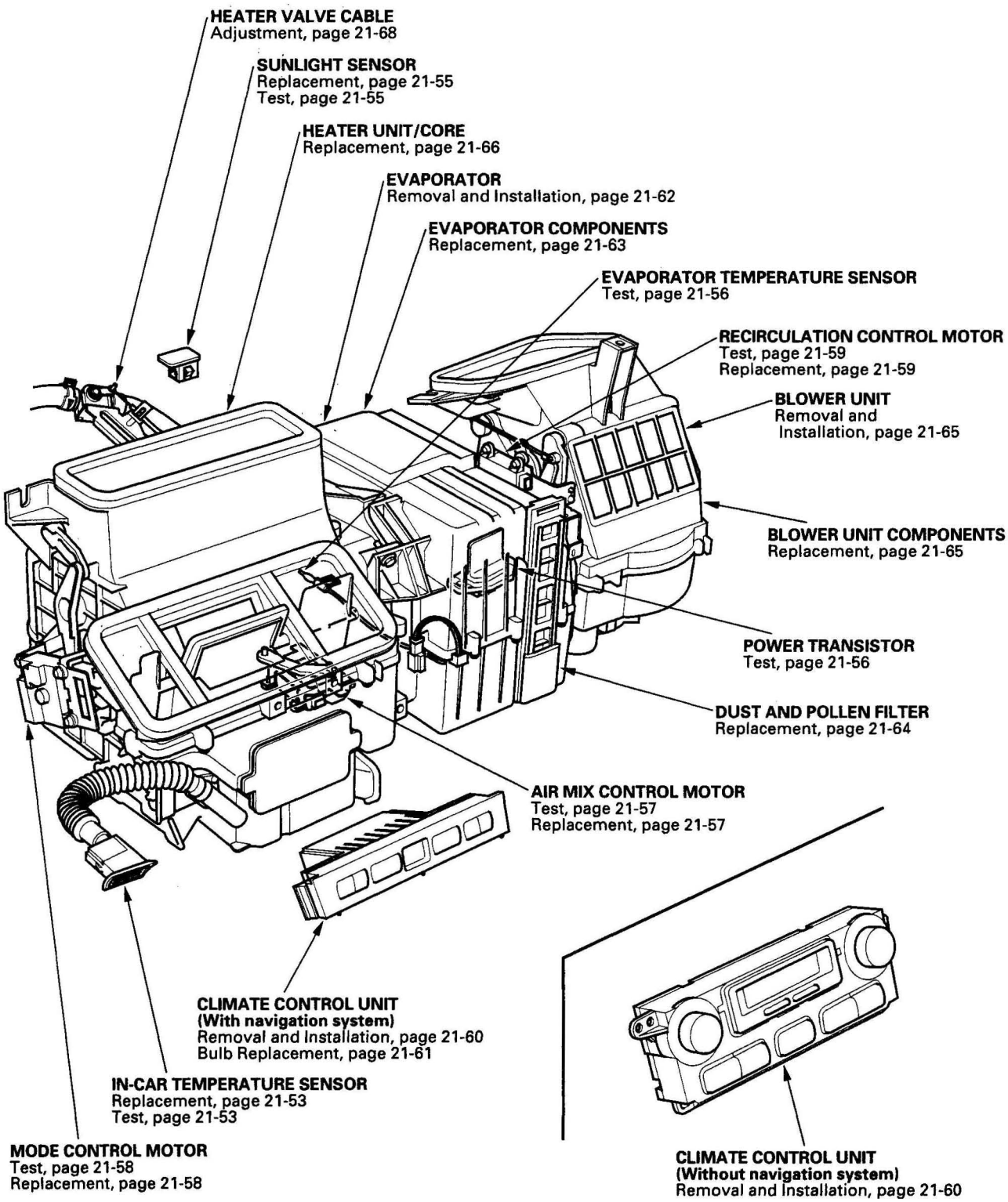
Protected by AR

Component Location Index (cont'd)



BACK

Protected by AR



Protected by AR

A/C Service Tips and Precautions

⚠ WARNING

- Compressed air mixed with R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

⚠ CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

The air conditioning system uses HFC-134a (R-134a) refrigerant and polyalkyleneglycol (PAG) refrigerant oil, which are not compatible with CFC-12 (R-12) refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system, and do not attempt to use R-12 servicing equipment; damage to the air conditioning system or your servicing equipment will result. Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove R-134a from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

- Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
- Keep moisture and dirt out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
- Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
- When tightening or loosening a fitting, use a second wrench to support the matching fitting.
- When discharging the system, use a R-134a refrigerant recovery/recycling/charging station; don't release refrigerant into the atmosphere.

A/C Refrigerant Oil Replacement

Recommended PAG oil: DENSO ND-OIL 8:

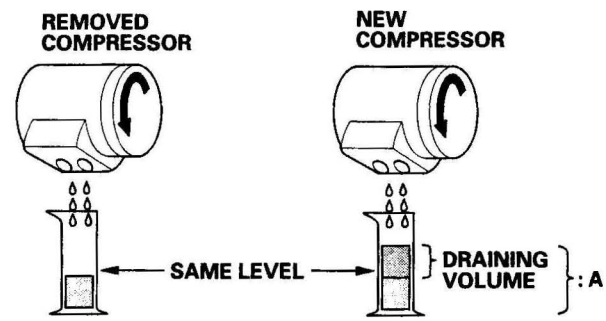
- P/N 38897-PR7-A01AH: 120 mℓ (4 fl·oz)
- P/N 38899-PR7-A01: 40 mℓ (1 1/3 fl·oz)

Add the recommended refrigerant oil in the amount listed if you replace any of the following parts.

- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if it gets on the paint, wash it off immediately.

Condenser .....25 mℓ (5/6 fl·oz, 0.9 Imp·oz)
Evaporator .....40 mℓ (1 1/3 fl·oz, 1.4 Imp·oz)
Line or hose .....10 mℓ (1/3 fl·oz, 0.4 Imp·oz)
Receiver/Dryer .....10 mℓ (1/3 fl·oz, 0.4 Imp·oz)
Leakage repair .....25 mℓ (5/6 fl·oz, 0.9 Imp·oz)
Compressor .....For compressor replacement, subtract the volume of oil drained from the removed compressor from 160 mℓ (5 1/3 fl·oz, 5.6 Imp·oz), and drain the calculated volume of oil from the new compressor: 160 mℓ (5 1/3 fl·oz, 5.6 Imp·oz) − Volume of removed compressor = Volume to drain from new compressor.

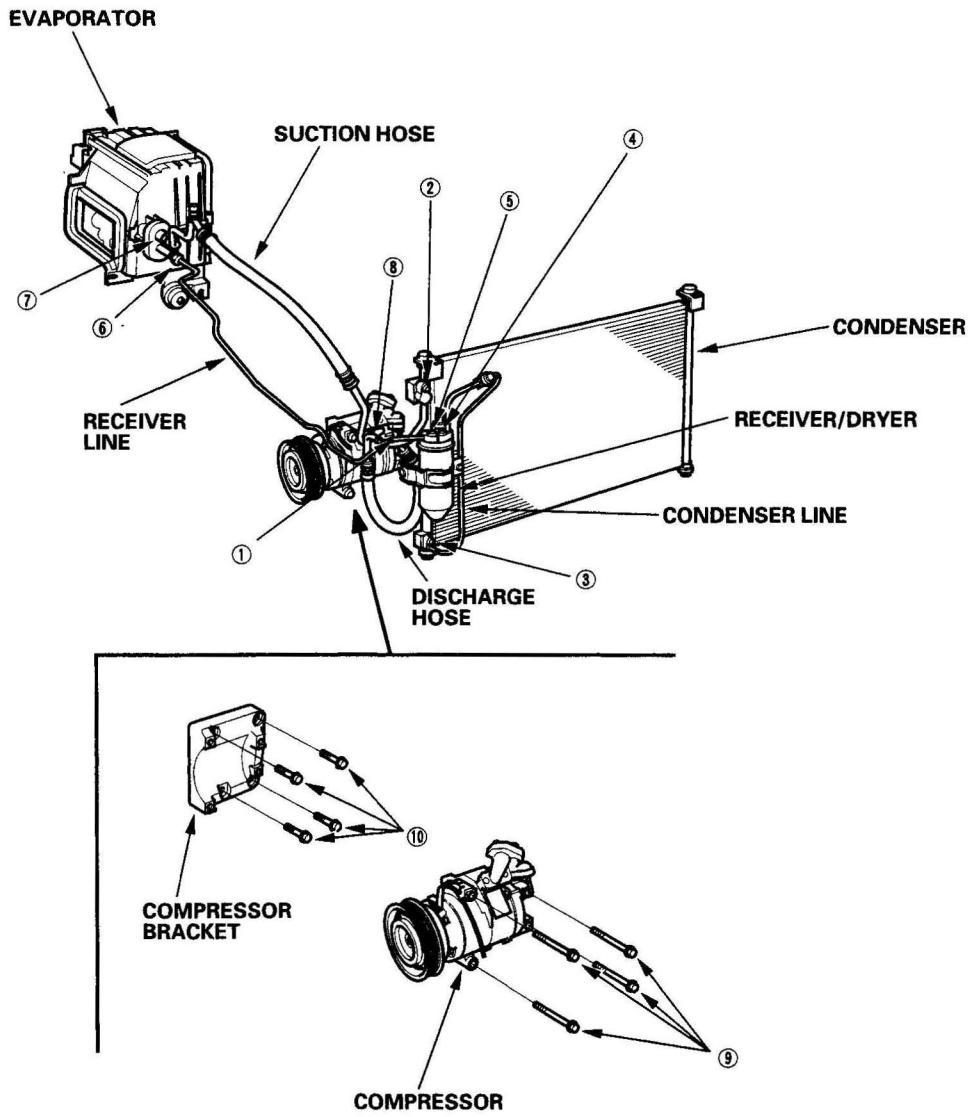
NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 mℓ (1 2/3 fl·oz, 1.8 Imp·oz) from the new compressor.



A: 160 mℓ (5 1/3 fl·oz, 5.6 Imp·oz)

BACK

Protected by AR



① Discharge hose to the compressor (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
② Discharge hose to the condenser (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
③ Condenser line to the condenser (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
④ Condenser line to the receiver/dryer (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑤ Receiver line to the receiver/dryer (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑥ Receiver line to the evaporator : 13 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑦ Suction hose to the evaporator : 31 N·m (3.2 kgf·m, 23 lbf·ft)
⑧ Suction hose to the compressor (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑨ Compressor to compressor bracket (8 x 1.25 mm) : 22 N·m (2.2 kgf·m, 16 lbf·ft)
⑩ Compressor bracket to the engine block (10 x 1.25 mm) : 44 N·m (4.5 kgf·m, 33 lbf·ft)

BACK

Protected by AR

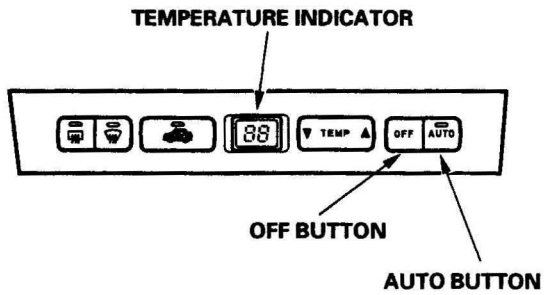
General Troubleshooting Information

How to Retrieve a DTC

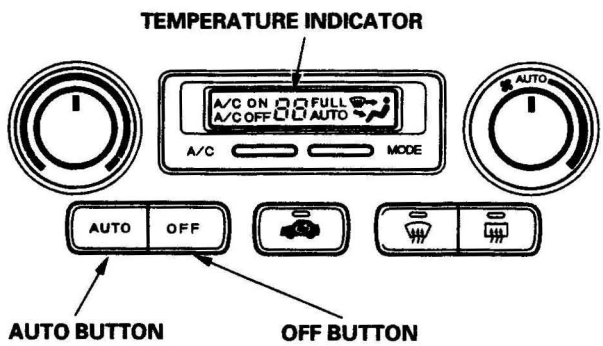
The climate control unit has a self-diagnosis function.

Running the Self-diagnosis Function

With Navigation System



Without Navigation System



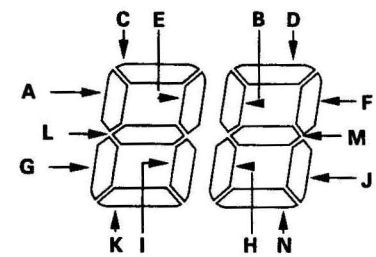
1. Turn the ignition switch ON (II).
2. Press the AUTO button and then the OFF button. Continue to hold both buttons down for 1 minute.

If there is any abnormality in the system, the temperature indicator will light up the segment (A through N) corresponding to the error. The temperature indicator will then alternate every second between displaying "88" (all segments lit) and the error code segment (A through N).

NOTE: The system will only display the DTC when the AUTO and OFF buttons are pressed. If you release the buttons, the display will go blank. To return the display, simply press the AUTO then the OFF buttons again.

To determine the meaning of the DTC, refer to the DTC Troubleshooting Index. If there is no abnormality, the segments will not light up.

TEMPERATURE INDICATOR



Resetting the Self-diagnosis Function

Turn the ignition switch OFF to cancel the self-diagnosis function. After completing repair work, run the self-diagnosis function again to make sure that there are no other malfunctions.

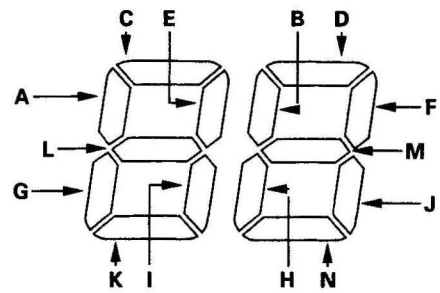
BACK

Protected by AR

DTC Troubleshooting Index

To retrieve the DTC, you must run the self-diagnosis function (see page 21-8). In the case of multiple problems, the respective indicator segments will come on. If indicator segments A, C, E, G, I and L come on at the same time, there may be an open in the common ground wire of the sensors.

TEMPERATURE INDICATOR



DTC (Temperature Indicator segment)	Detection Item	Page
A	An open in the in-car temperature sensor circuit	(see page 21-20)
B	A short in the in-car temperature sensor circuit	(see page 21-21)
C	An open in the outside air temperature sensor circuit	(see page 21-21)
D	A short in the outside air temperature sensor circuit	(see page 21-23)
E	An open in the sunlight sensor circuit	(see page 21-23)
F	A short in the sunlight sensor circuit	(see page 21-24)
G	An open in the evaporator temperature sensor circuit	(see page 21-25)
H	A short in the evaporator temperature sensor circuit	(see page 21-26)
I	An open in the air mix control motor circuit	(see page 21-27)
J	A Short in the air mix control motor circuit	(see page 21-27)
K	A problem in the air mix control linkage, door, or motor	(see page 21-28)
L	An open or short in the mode control motor circuit	(see page 21-29)
M	A problem in the mode control linkage, door, or motor	(see page 21-30)
N	A problem in the blower motor circuit	(see page 21-31)

BACK

Protected by AR

Symptom Troubleshooting Index

Type S Model

Symptom	Diagnostic procedure	Also check for
Recirculation control doors do not change between Fresh and Recirculate	Recirculaion Control Motor Circuit Troubleshooting (see page 21-34)	• Blown fuse No. 3 (7.5A) in the driver's under-dash fuse/relay box • Cleanliness and tightness of all connectors
The blower motor does not run immediately even through the engine is fully warmed up NOTE: The temperature control dial or button must be set between 60°F (18°C) and 90°F (32°C)	ECT Sensor Circuit Troubleshooting (see page 21-35)	Cleanliness and tightness of all connectors
No access to climate control functions from navigation panel display	Communication Line Circuit Troubleshooting (see page 21-36)	Cleanliness and tightness of all connectors
Both heater and A/C do not work	Climate Control Power and Ground Circuits Troubleshooting (see page 21-37)	• Blown fuse No. 54 (40A) in the under-hood fuse/relay box, No. 3 (7.5A) in the driver's under-dash fuse/relay box, and No. 13 (7.5A) in the passenger's under-dash fuse/relay box • Poor ground at No. G401 • Cleanliness and tightness of all connectors
Both fans do not run at low speed with the A/C on when the refrigerant pressure is below 1,520 kPa (15.5 kgf/cm², 220 psi)	Radiator and Condenser Fans Low Speed Circuit Troubleshooting (see page 21-38)	• Blown fuse No. 58 (30A) in the under-hood fuse/relay box, and No. 3 (7.5A) in the driver's under-dash fuse/relay box • Poor ground at No. G201 • Cleanliness and tightness of all connectors
Condenser fan does not run at high speed when the engine coolant temperature is above 210°F (99°C) or the refrigrant pressure is above 1,520 kPa (15.5 kg/cm², 220 psi) with the A/C on	Condenser Fan High Speed Circuit Troubleshooting (see page 21-41)	• Blown fuse No. 3 (7.5A) in the driver's under-dash fuse/relay box • Poor ground at No. G302 • Cleanliness and tightness of all connectors
Both fans do not run at high speed with the A/C on when the refrigerant pressure is above 1,520 kPa (15.5 kg/cm², 220 psi)	Radiator and Condenser Fans High Speed Circuit Troubleshooting (see page 21-42)	Cleanliness and tightness of all connectors
Compressor clutch does not engage	Compressor Clutch Circuit Troubleshooting (see page 21-46)	• Blown fuse No. 58 (30A) in the under-hood fuse/relay box, No. 14 (7.5A) in the passenger's under-clach fuse/relay box, and No. 3 (7.5A) in the driver's under-dash fuse/relay box • Cleanliness and tightness of all connectors
A/C System does not come on (both fans and compressor)	A/C pressure Switch Circuit Troubleshooting (see page 21-50)	Cleanliness and tightness of all connectors

BACK

Protected by AR

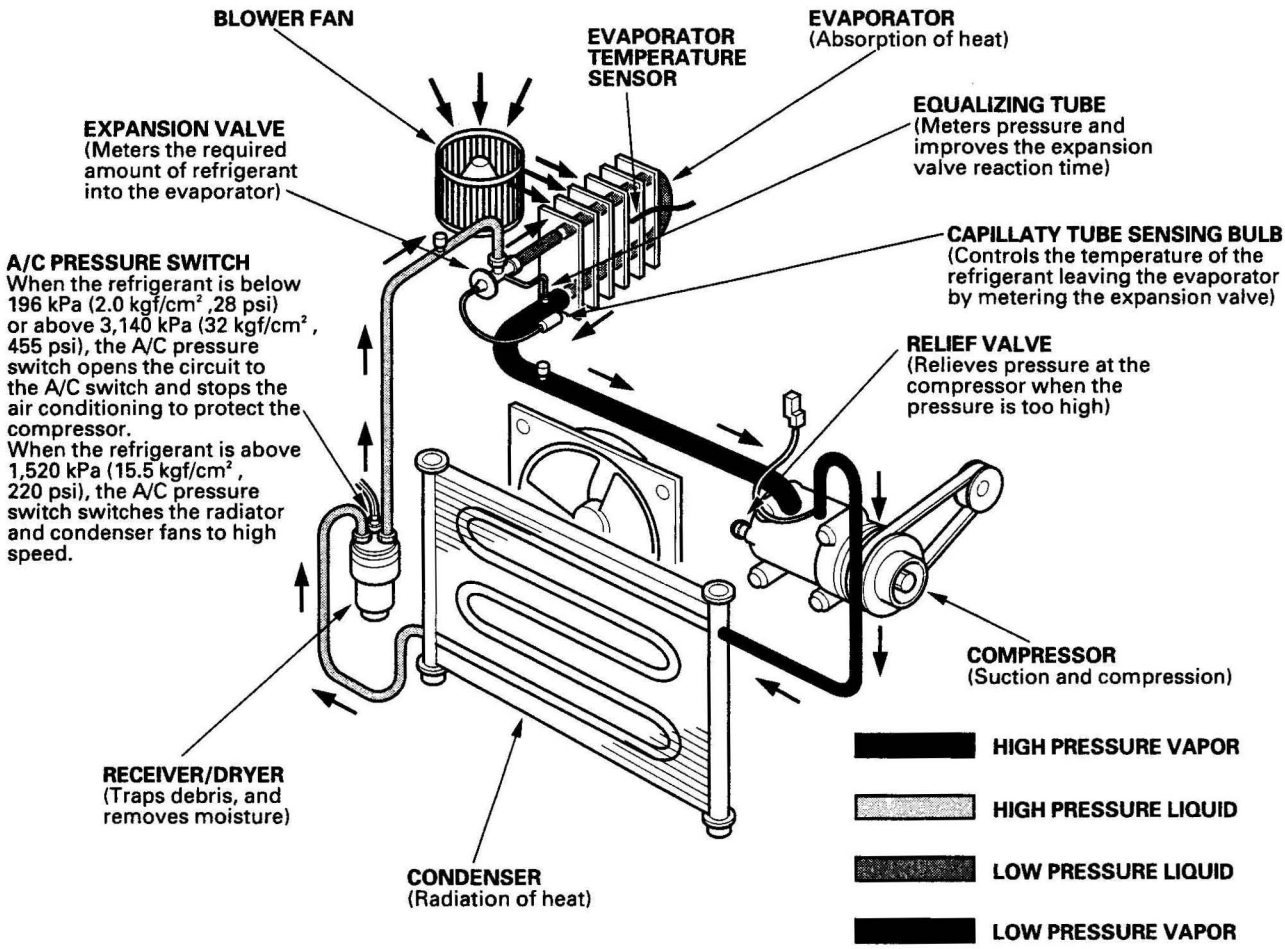
Except Type S Model

Symptom	Diagnostic procedure	Also check for
Recirculation control doors do not change between Fresh and Recirculate	Recirculaion Control Motor Circuit Troubleshooting (see page 21-34)	• Blown fuse No. 3 (7.5A) in the driver's under-dash fuse/relay box • Cleanliness and tightness of all connectors
The blower motor does not run immediately even through the engine is fully warmed up NOTE: The temperature control dial or button must be set between 60°F (18°C) and 90°F (32°C)	ECT Sensor Circuit Troubleshooting (see page 21-35)	Cleanliness and tightness of all connectors
No access to climate control functions from navigation panel display	Communication Line Circuit Troubleshooting (see page 21-36)	Cleanliness and tightness of all connectors
Both heater and A/C do not work	Climate Control Power and Ground Circuits Troubleshooting (see page 21-37)	• Blown fuse No. 54 (40A) in the under-hood fuse/relay box, No. 3 (7.5A) in the driver's under-dash fuse/relay box, and No. 13 (7.5A) in the passenger's under-dash fuse/relay box • Poor ground at No. G401 • Cleanliness and tightness of all connectors
Condenser fans does not run at all (but radiator fan runs with the A/C on)	Condenser Fan Circuit Troubleshooting (see page 21-43)	• Blown fuse No. 58 (20A) in the under-hood fuse/relay box, and No. 3 (7.5A) in the driver's under-dash fuse/relay box • Poor ground at No. G201 • Cleanliness and tightness of all connectors
Both fans do not run with the A/C on	Radiator and Condenser Fans Common Circuit Troubleshooting (see page 21-45)	• Blown fuse No. 57 (20A) and No. 58 (20A) in the under-hood fuse/relay box, and No. 3 (7.5A) in the driver's under-dash fuse/relay box • Cleanliness and tightness of all connectors
Compressor clutch does not engage	Compressor Clutch Circuit Troubleshooting (see page 21-45)	• Blown fuse No. 58 (20A) in the under-hood fuse/relay box, and No. 3 (7.5A) in the driver's under-dash fuse/relay box • Cleanliness and tightness of all connectors
A/C System does not come on (both fans and compressor)	A/C Pressure Switch Circuit Troubleshooting (see page 21-51)	Cleanliness and tightness of all connectors

Protected by AR

System Description

The air conditioning system removes heat from the passenger compartment by circulating refrigerant through the system as shown below.



This vehicle uses HFC-134a (R-134a) refrigerant which does not contain chlorofluorocarbons. Pay attention to the following service items:

- Do not mix refrigerants CFC-12 (R-12) and HFC-134a (R-134a). They are not compatible.
- Use only the recommended polyalkyleneglycol (PAG) refrigerant oil (DENSO ND-OIL8) designed for the R-134a compressor. Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in compressor failure.
- All A/C system parts (compressor, discharge line, suction line, evaporator, condenser, receiver/dryer, expansion valve, O-rings for joints) have to be proper for refrigerant R-134a. Do not confuse with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- R-12 and R-134a refrigerant servicing equipment are not interchangeable. Use only a recovery/recycling/charging station that is U.L.-listed and is certified to meet the requirements of SAE J2210 to service R-134a air conditioning system.
- Always recover the refrigerant R-134a with an approved recovery/recycling/charging station before disconnecting any A/C fitting.

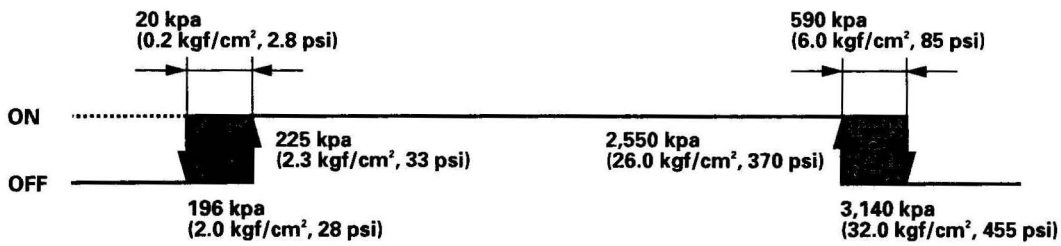
BACK

Protected by AR

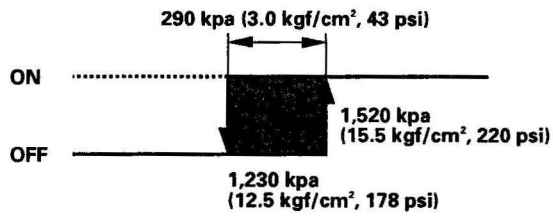
A/C Pressure Switch (Type S Model)

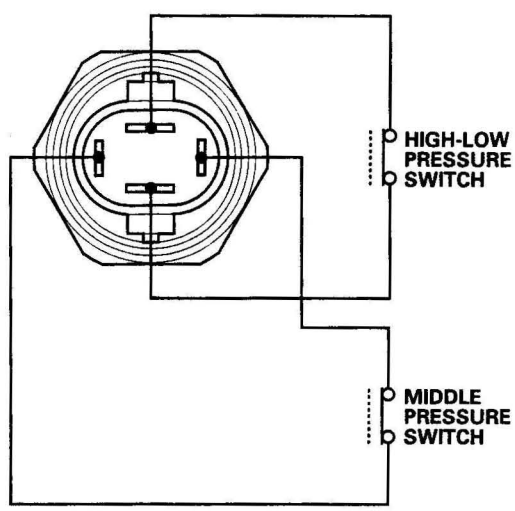
The A/C pressure switch consists of a High-Low pressure switch (A/C pressure switch A) and a Middle pressure switch (A/C pressure switch B).

- High-Low pressure switch
  If the refrigerant pressure becomes too high (due to blockage), or too low (due to leakage), the A/C pressure switch sends a signal to the PCM to prevent the compressor from operating.



- Middle pressure switch
  If the refrigerant pressure goes above or below 1,520 kpa (15.5 kgf/cm², 220 psi), the A/C pressure switch sends a signal to the climate control unit to change the speed of the condensor fan and radiator fan (High-Low).





(cont'd)

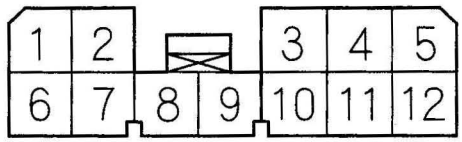
Protected by AR

System Description (cont'd)

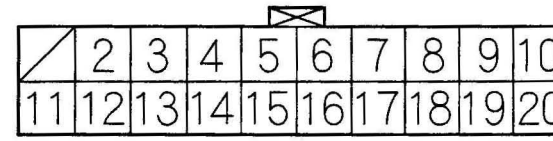
Climate Control Unit Inputs and Outputs

CLIMATE CONTROL UNIT CONNECTORS

CONNECTOR A (12P)



CONNECTOR B (20P)



Wire side of female terminals

CONNECTOR A (□ on Circuit Diagram)

Cavity	Wire color	Signal	
1	BLU/BLK	MODE DEF	OUTPUT
2	RED/YEL	AIR MIX HOT	OUTPUT
3	BLK	GROUND	OUTPUT
4	BRN/YEL	REAR WINDOW DEFOGGER RELAY	INPUT
5	RED/BLK	TAILLIGHT RELAY	INPUT
6	BLU/WHT	MODE VENT	OUTPUT
7	RED/WHT	AIR MIX COOL	OUTPUT
8	BLU/RED	BLOWER FEEDBACK	INPUT
9	ORN/BLK	POWER TRANSISTOR	OUTPUT
10	WHT/YEL *2 WHT/RED *3	+B (Power)	INPUT
11	BLK/YEL	IG2 (Power)	INPUT
12	RED	MULTIPLEX CONTROL UNIT (DRIVER'S)	OUTPUT

CONNECTOR B (○ on Circuit Diagram)

Cavity	Wire color	Signal	
1	———	———	———
2	WHT/RED	SUNLIGHT SENSOR	OUTPUT
3	RED/WHT	ENGINE COOLANT TEMPERATURE (ECT) SENSOR	OUTPUT
4	BRN/WHT	OUTSIDE AIR TEMPERATURE SENSOR	OUTPUT
5	YEL/RED	IN-CAR TEMPERATURE SENSOR	OUTPUT
6	GRY	AIR MIX POTENTIAL +5V	OUTPUT
7	PNK/BLK	AIR MIX POTENTIAL	OUTPUT
8 *1	LT GRN/WHT	NAVIGATION DISPLAY (CLK2)	OUTPUT
9	GRN/WHT	RECIRCULATE	INPUT
10	GRN/RED	FRESH	INPUT
11	YEL/GRN	A/C PRESSURE SWITCH	INPUT
12 *1	LT GRN/RED	NAVIGATION DISPLAY (SO)	OUTPUT
13	BRN	EVAPOLATOR TEMPERRATURE SENSOR	OUTPUT
14 *1	LT GRN/BLK	NAVIGATION DISPLAY (SI)	INPUT
15	YEL/GRN	SENSOR COMMON GROUND	INPUT
16	BLU/WHT	VEHICLE SPEED SENSOR (VSS)	OUTPUT
17	GRN/BLK	MODE 1,4	OUTPUT
18	GRN/YEL	MODE 2	OUTPUT
19	LT GRN/BLK	MODE 3,6	OUTPUT
20	BLU/GRN	MODE 5	OUTPUT

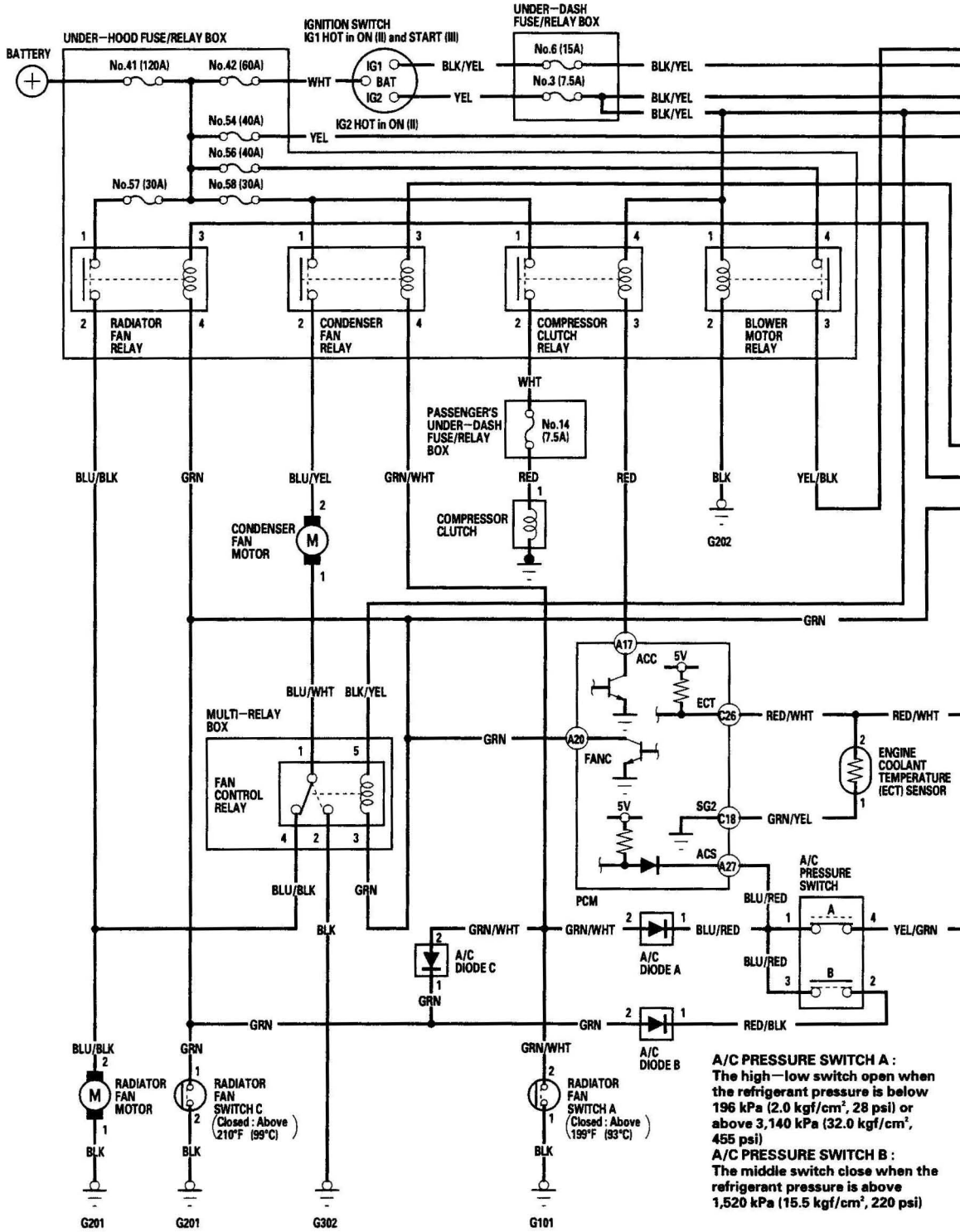
* 1: With navigation system
* 2: '99 model
* 3: '00-03 models

BACK

Protected by AR

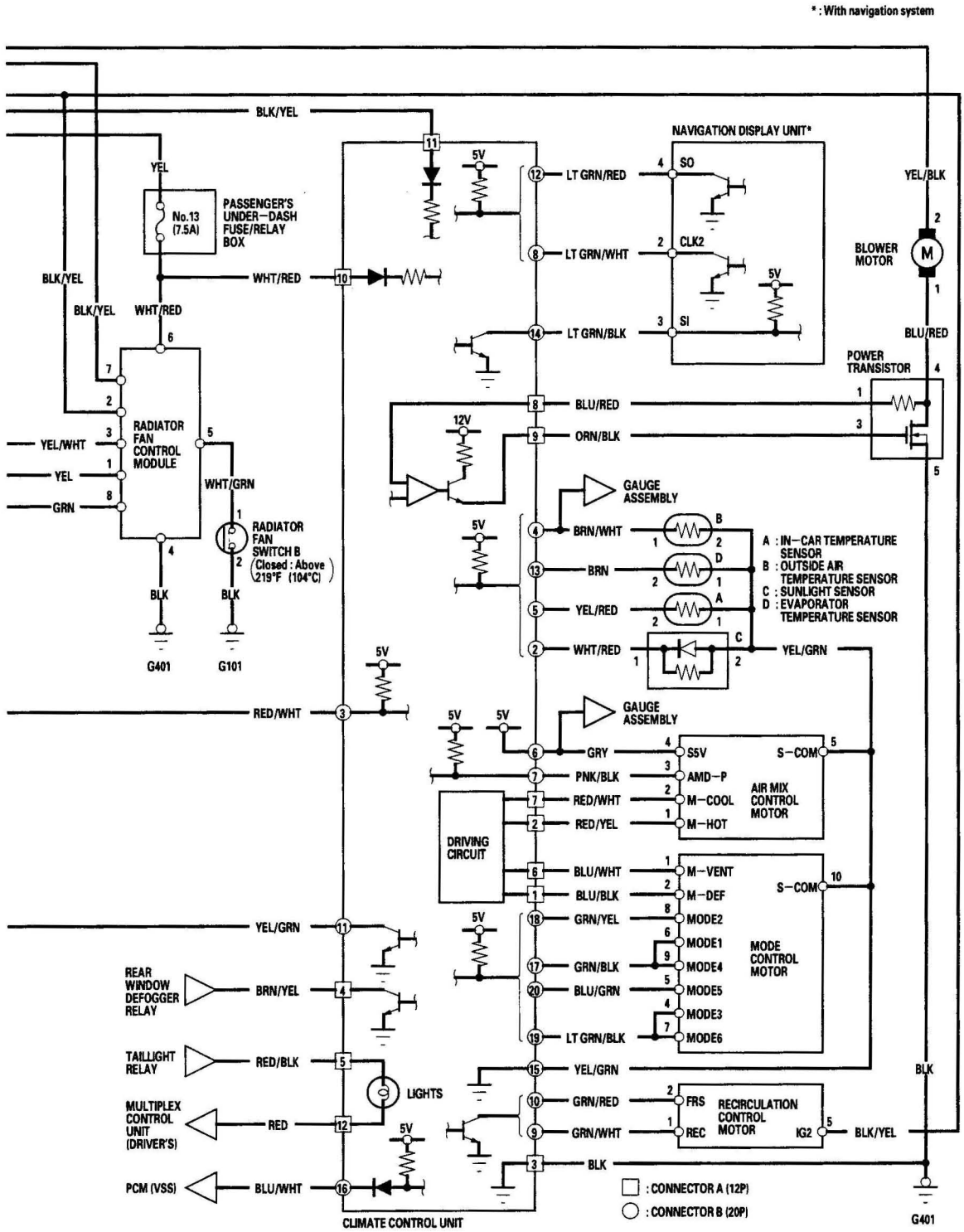
Circuit Diagram

Type S Model



BACK

Protected by AR

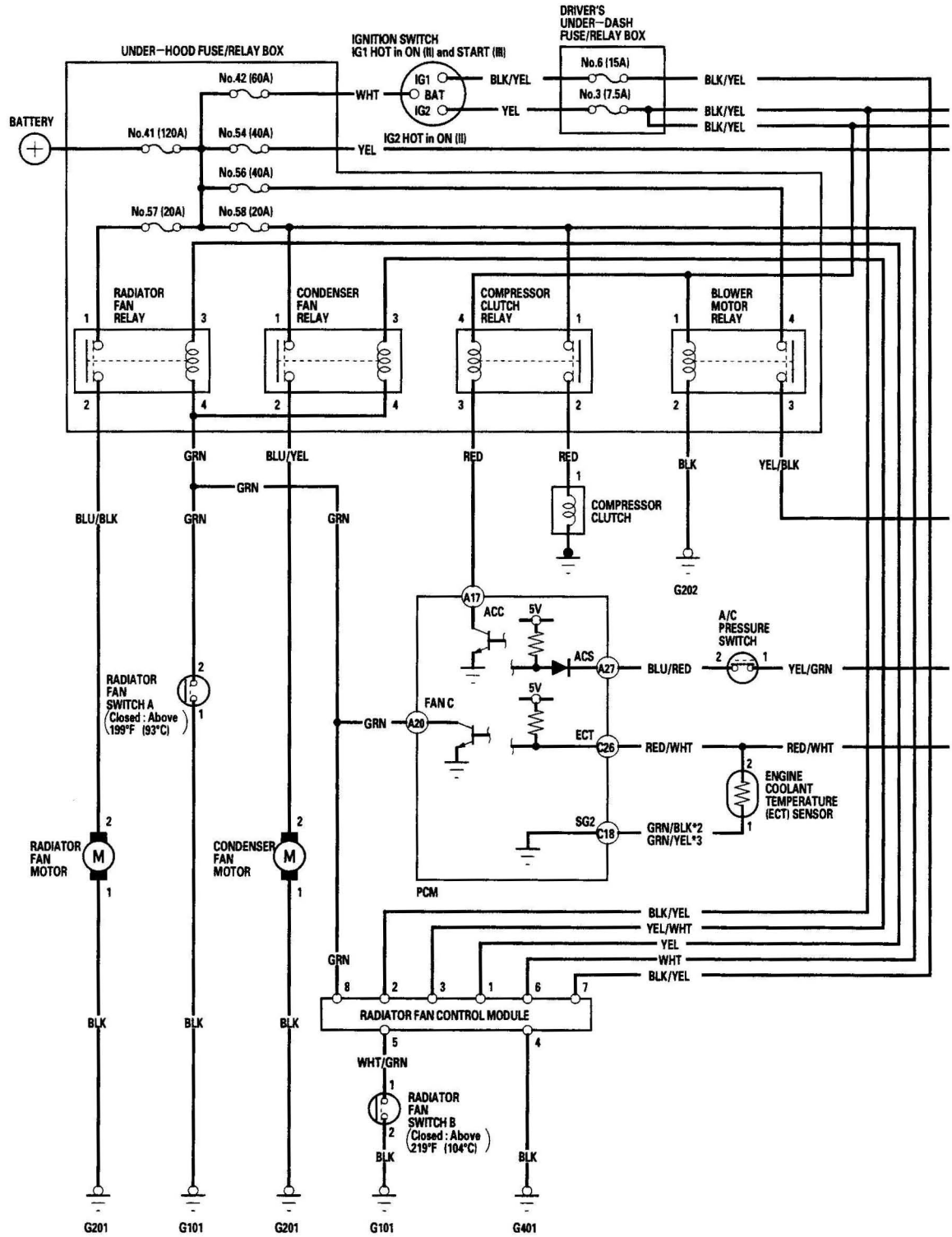


BACK

Protected by AR

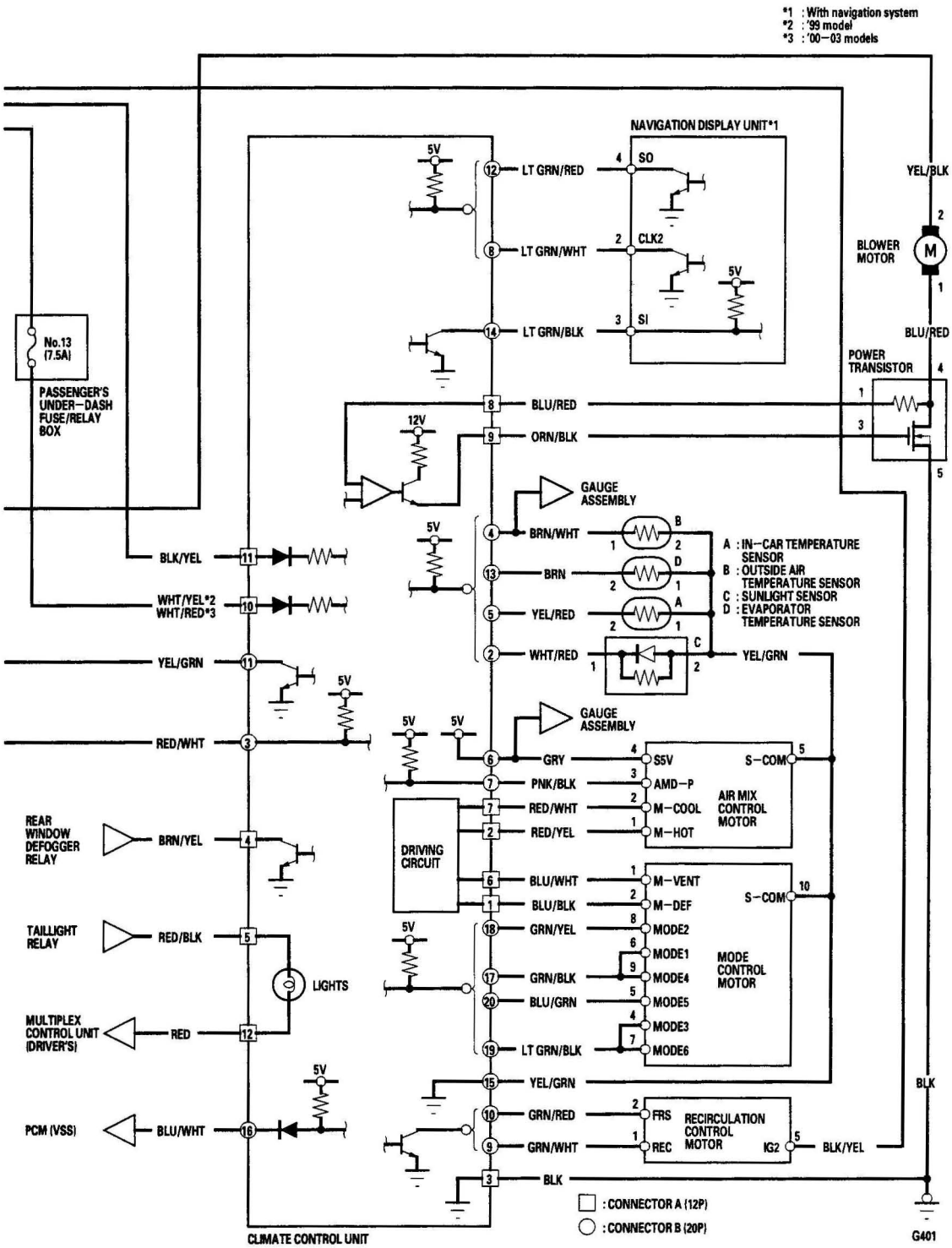
Circuit Diagram (cont'd)

Except Type S Model



BACK

Protected by AR



BACK

Protected by AR

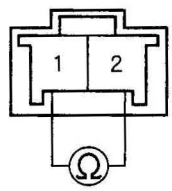
DTC Troubleshooting

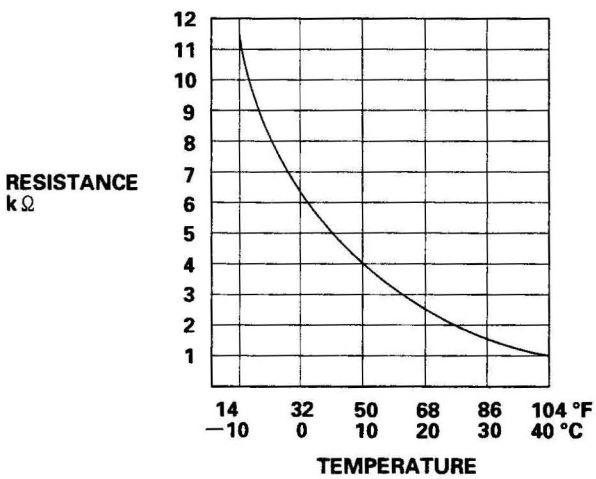
DTC indicator light A: An Open in the In-car Temperature Sensor Circuit

1. Remove the in-car temperature sensor (see page 21-53).

2. Measure the resistance between the No. 1 and No. 2 terminals of the in-car temperature sensor. *Check for a change in resistance by heating or cooling the sensor with a hair drier.

IN-CAR TEMPERATURE SENSOR





Is the resistance within the specifications shown on the graph?

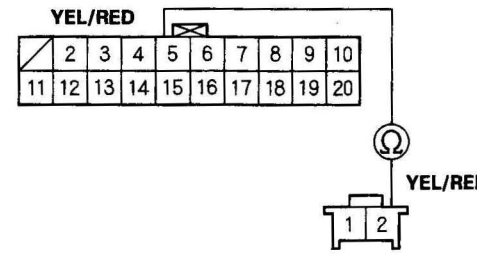
YES — Go to step 3.

NO — Replace the in-car temperature sensor. ■

3. Disconnect climate control unit connector B (20P).

4. Check for continuity between the No. 5 terminal of climate control unit connector B (20P) and the No. 2 terminal of the in-car temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals



IN-CAR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

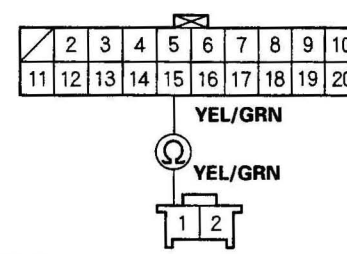
Is there continuity?

YES — Go to step 5.

NO — Repair open in the wire between the climate control unit and the in-car temperature sensor. ■

5. Check for continuity between the No. 15 terminal of climate control unit connector B (20P) and the No. 1 terminal of the in-car temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals



IN-CAR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES — Check for loose wires or poor connections at climate control unit connector B (20P) and at the in-car temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO — Repair open in the wire between the climate control unit and the in-car temperature sensor. ■

BACK

Protected by AR

DTC indicator light B: A Short in the In-car Temperature Sensor Circuit

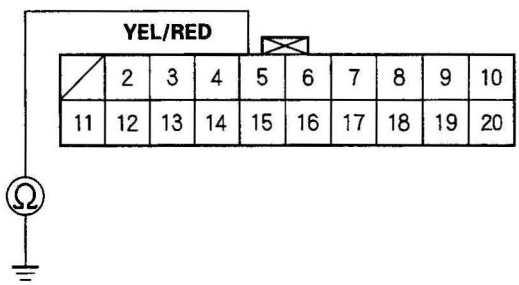
1. Remove the in-car temperature sensor (see page 21-53).
2. Test the in-car temperature sensor (see page 21-53).

   Is the resistance within the specifications shown on the graph?

   YES – Go to step 3.

   NO – Replace the in-car temperature sensor. ■
3. Disconnect climate control unit connector B (20P).
4. Check for continuity between the No. 5 terminal of climate control unit connector B (20P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there continuity?

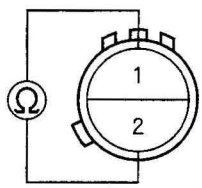
YES – Repair short to body ground in the wire between the climate control unit and the in-car temperature sensor. ■

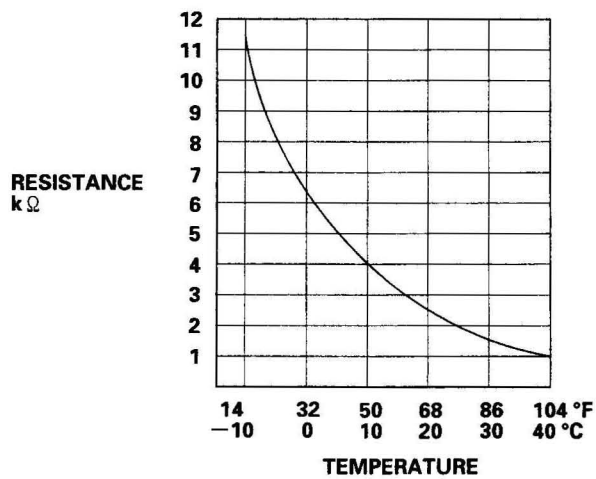
NO – Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

DTC indicator light C: An Open in the Outside Air Temperature Sensor Circuit

1. Remove the outside air temperature sensor (see page 21-54).
2. Measure the resistance between the No. 1 and No. 2 terminals of the outside air temperature sensor.
   * Dip the sensor in ice water, and measure resistance. Then pour hot water on the sensor, and check for a change in resistance.

OUTSIDE AIR TEMPERATURE SENSOR





** Is the resistance within the specifications shown on the graph?*

YES – Go to step 3.

NO – Replace the outside air temperature sensor. ■

3. Disconnect climate control unit connector B (20P).

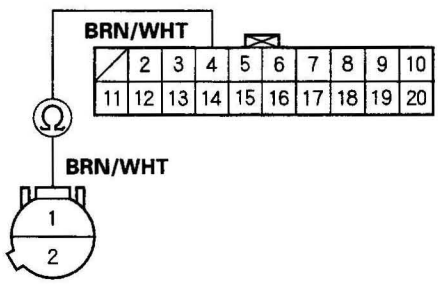
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

4. Check for continuity between the No. 4 terminal of climate control unit connector B (20P) and the No. 1 terminal of the outside air temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals



OUTSIDE AIR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

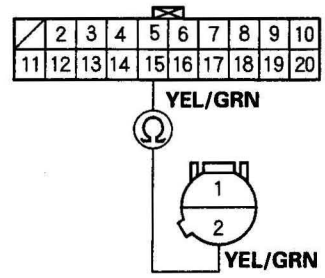
Is there continuity?

YES—Go to step 5.

NO—Repair open in the wire between the climate control unit and the outside air temperature sensor.■

5. Check for continuity between the No. 15 terminal of climate control unit connector B (20P) and the No. 2 terminal of the outside air temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals



OUTSIDE AIR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Check for loose wires or poor connections at climate control unit connector B (20P) and at the outside air temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

NO—Repair open in the wire between the climate control unit and the outside air temperature sensor.■

BACK

Protected by AR

DTC indicator light D: A Short in the Outside Air Temperature Sensor Circuit

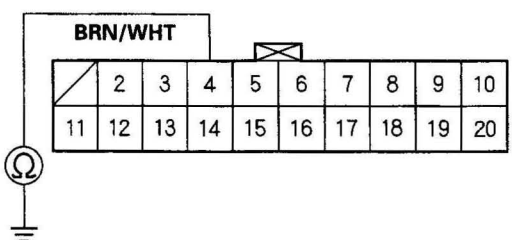
1. Remove the outside air temperature sensor (see page 21-54).
2. Test the outside air temperature sensor (see page 21-54).

   Is the resistance within the specifications shown on the graph?

   YES – Go to step 3.

   NO – Replace the outside air temperature sensor. ■
3. Disconnect climate control unit connector B (20P).
4. Check for continuity between the No. 4 terminal of climate control unit connector B (20P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there continuity?

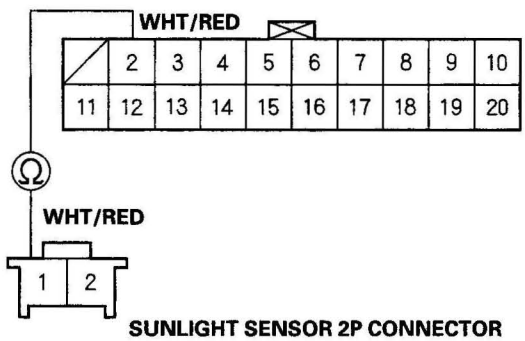
YES – Repair short to body ground in the wire between the climate control unit and the outside air temperature sensor. ■

NO – Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

DTC indicator light E: An Open in the Sunlight Sensor Circuit

1. Disconnect the sunlight sensor 2P connector.
2. Disconnect climate control unit connector B (20P).
3. Check for continuity between the No. 2 terminal of climate control unit connector B (20P) and the No. 1 terminal of the sunlight sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals



SUNLIGHT SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Go to step 4.

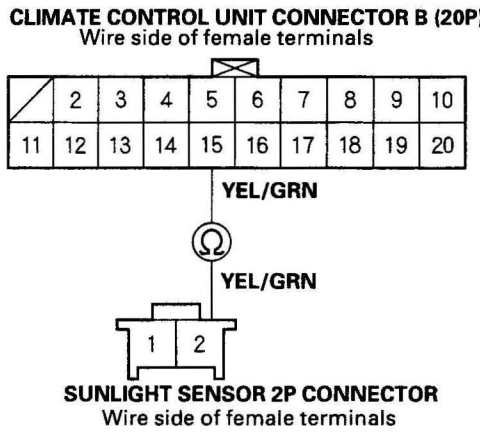
NO – Repair open in the wire between the climate control unit and the sunlight sensor. ■

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

4. Check for continuity between the No. 15 terminal of climate control unit connector B (20P) and the No. 2 terminal of the sunlight sensor 2P connector.



Is there continuity?

YES – Go to step 5.

NO – Repair open in the wire between the climate control unit and the sunlight sensor. ■

5. Reconnect the sunlight sensor 2P connector.
6. Reconnect climate control unit connector B (20P).
7. Test the sunlight sensor (see page 21-55).

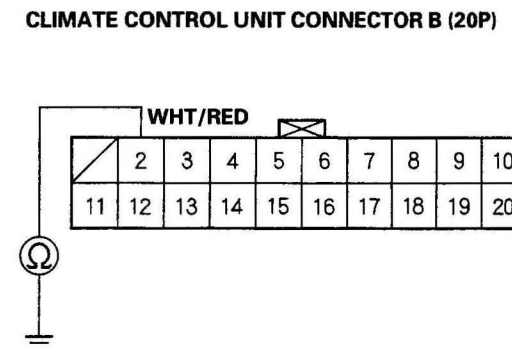
Is the sunlight sensor OK?

YES – Check for loose wires or poor connections at climate control unit connector B (20P) and at the sunlight sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO – Replace the sunlight sensor. ■

DTC indicator light F: A Short in the Sunlight Sensor Circuit

1. Disconnect the sunlight sensor 2P connector.
2. Disconnect climate control unit connector B (20P).
3. Check for continuity between the No. 2 terminal of climate control unit connector B (20P) and body ground.



Is there continuity?

YES – Repair short to body ground in the wire between the climate control unit and the sunlight sensor. ■

NO – Go to step 4.

4. Reconnect the sunlight sensor 2P connector.
5. Reconnect climate control unit connector B (20P).
6. Test the sunlight sensor (see page 21-55).

Is the sunlight sensor OK?

YES – Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO – Replace the sunlight sensor. ■

BACK

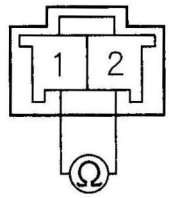
Protected by AR

DTC indicator light G: An Open in the Evaporator Temperature Sensor Circuit

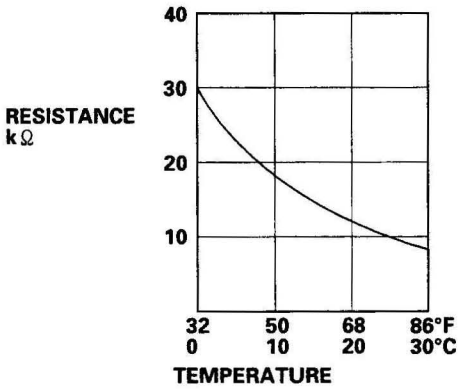
1. Disconnect the evaporator temperature sensor 2P connector.

2. Measure the resistance between the No. 1 and No. 2 terminals of the evaporator temperature sensor.

EVAPORATOR TEMPERATURE SENSOR



Terminal side of male terminals



Is the resistance within the specifications shown on the graph?

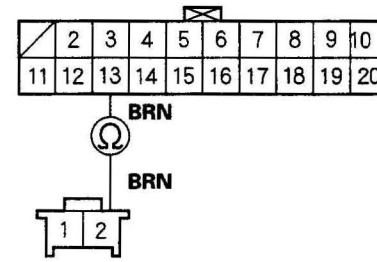
YES – Go to step 3.

NO – Replace the evaporator temperature sensor. ■

3. Disconnect climate control unit connector B (20P).

4. Check for continuity between the No. 13 terminal of climate control unit connector B (20P) and the No. 2 terminal of the evaporator temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Go to step 5.

NO – Repair open in the wire between the climate control unit and the evaporator temperature sensor. ■

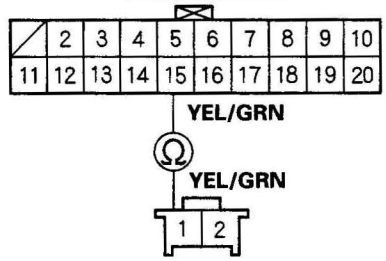
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

5. Check for continuity between the No. 15 terminal of climate control unit connector B (20P) and the No. 1 terminal of the evaporator temperature sensor 2P connector.

CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Check for loose wires or poor connections at climate control unit connector B (20P) and at the evaporator temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

NO—Repair open in the wire between the climate control unit and the evaporator temperature sensor.■

DTC indicator light H: A Short in the Evaporator Temperature Sensor Circuit

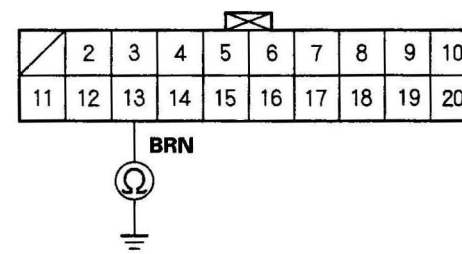
1. Disconnect the evaporator temperature sensor 2P connector.
2. Test the evaporator temperature sensor (see page 21-56).

   Is the resistance within the specifications shown on the graph?

   YES—Go to step 3.

   NO—Replace the evaporator temperature sensor.■
3. Disconnect climate control unit connector B (20P).
4. Check for continuity between the No. 13 terminal of climate control unit connector B (20P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between the climate control unit and the evaporator temperature sensor.■

NO—Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

BACK

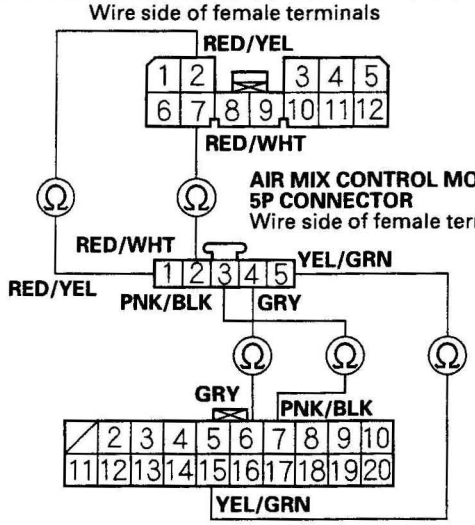
Protected by AR

DTC indicator light I: An Open in the Air Mix Control Motor Circuit

1. Disconnect the air mix control motor 5P connector.
2. Disconnect climate control unit connectors A (12P) and B (20P).
3. Check for continuity between following terminals of climate control unit connectors A (12P) and B (20P) and the air mix control motor 5P connector.

12P:	5P:
No. 2	No. 1
No. 7	No. 2
20P:	5P:
No. 6	No. 4
No. 7	No. 3
No. 15	No. 5

CLIMATE CONTROL UNIT CONNECTOR A (12P)
Wire side of female terminals



CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals

Is there continuity?

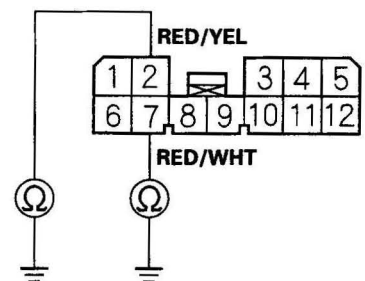
YES – Check for loose wires or poor connections at climate control unit connectors A (12P) and B (20P) and at the air mix control motor 5P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO – Repair any open in the wire(s) between the climate control unit and the air mix control motor. ■

DTC indicator light J: A Short in the Air Mix Control Motor Circuit

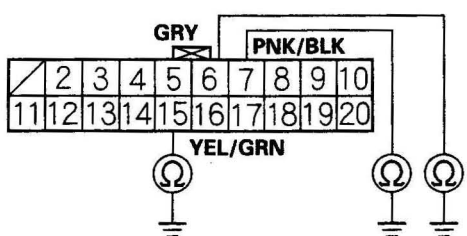
1. Disconnect the air mix control motor 5P connector.
2. Disconnect climate control unit connectors A (12P) and B (20P).
3. Check for continuity between body ground and climate control unit connector A (12P) terminals No. 2 and 7 individually, and between body ground and climate control unit connector B (20P) terminals No. 6, 7 and 15 individually.

CLIMATE CONTROL UNIT CONNECTOR A (12P)



Wire side of female terminals

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there continuity?

YES – Repair any short to body ground in the wire(s) between the climate control unit and the air mix control motor. ■

NO – Go to step 4.

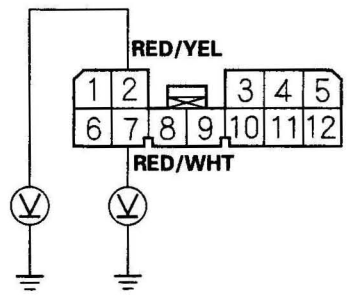
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

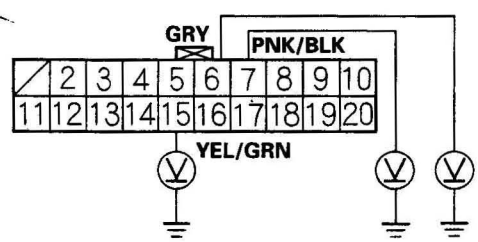
4. Turn the ignition switch ON (II), and check the same terminals for voltage.

CLIMATE CONTROL UNIT CONNECTOR A (12P)



Wire side of female terminals

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there any voltage?

YES—Repair short to power in the wire between the climate control unit and the air mix control motor. This short also damages the climate control unit. Repair the short to power before replacing the climate control unit.■

NO—Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

DTC indicator light K: A Problem in the Air Mix Control Linkage, Door, or Motor

1. Test the air mix control motor (see page 21-57).

   Is the air mix control motor OK?

   YES—Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

   NO—Go to step 2.

2. Remove the air mix control motor (see page 21-57).

3. Check the air mix control linkage and door for smooth movement.

   Do the air mix control linkage and door move smoothly?

   YES—Replace the air mix control motor.■

   NO—Repair the air mix control linkage or door.■

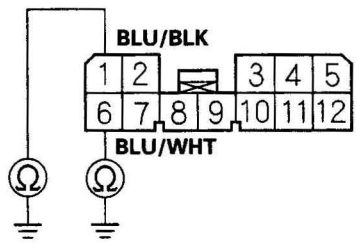
BACK

Protected by AR

DTC indicator light L: An Open or Short in the Mode Control Motor Circuit

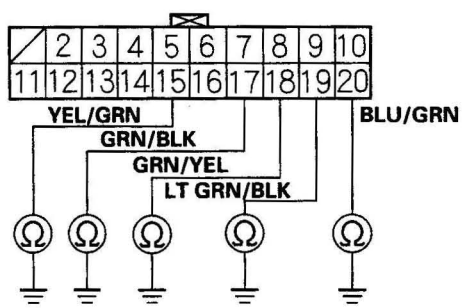
1. Disconnect the mode control motor 10P connector.
2. Disconnect climate control unit connectors A (12P) and B (20P).
3. Check for continuity between body ground and climate control unit connector A (12P) terminals No. 1 and 6 individually, and between body ground and climate control unit connector B (20P) terminals No. 15, 17, 18, 19 and 20 individually.

CLIMATE CONTROL UNIT CONNECTOR A (12P)



Wire side of female terminals

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

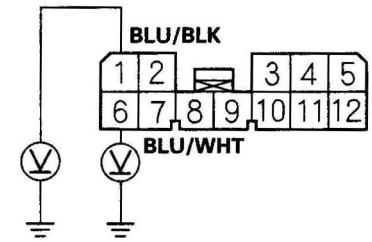
Is there continuity?

YES—Repair any short to body ground in the wire (s) between the climate control unit and the mode control motor.■

NO—Go to step 4.

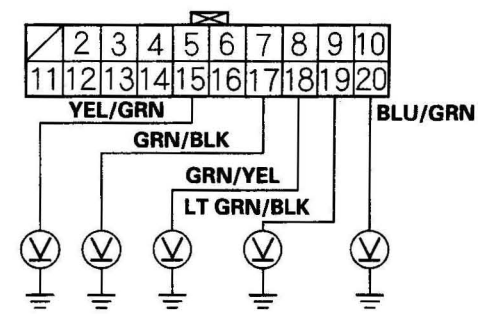
4. Turn the ignition switch ON (II), and check the same terminals for voltage.

CLIMATE CONTROL UNIT CONNECTOR A (12P)



Wire side of female terminals

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there any voltage?

YES—Repair short to power in the wire between the climate control unit and the mode control motor. This short also damages the climate control unit. Repair the short to power before replacing the climate control unit.■

NO—Go to step 5.

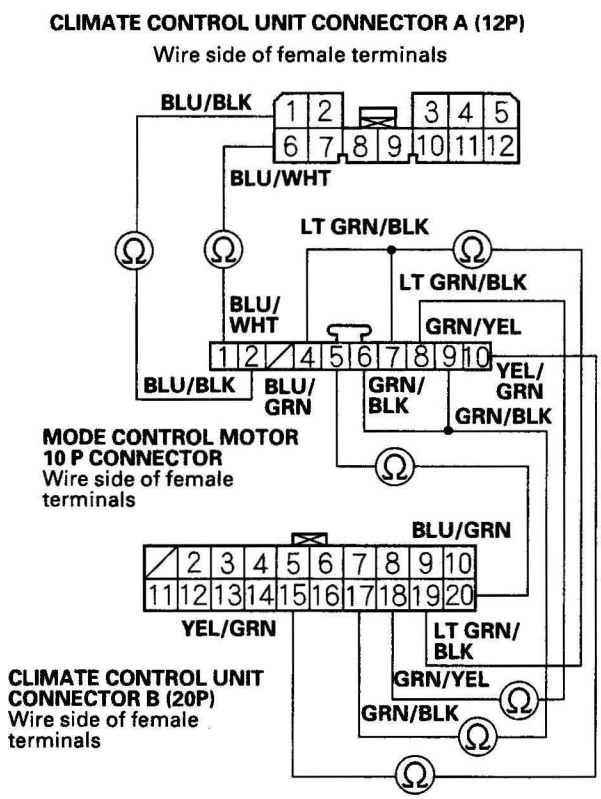
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

5. Turn the ignition switch OFF, and check for continuity between following terminals of climate control unit connectors A (12P) and B (20P) and the mode control motor 10P connector.

12P:	10P:
No. 1	No. 2
No. 6	No. 1
20P:	10P:
No. 15	No. 10
No. 17	No. 6, 9
No. 18	No. 8
No. 19	No. 4, 7
No. 20	No. 5



Is there continuity?

YES—Check for loose wires or poor connections at climate control unit connectors A (12P) and B (20P) and at the mode control motor 10P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

NO—Repair any open in the wire(s) between the climate control unit and the mode control motor.■

DTC indicator light M: A Problem in the Mode Control Linkage, Doors, or Motor

1. Test the mode control motor (see page 21-58).

   Is the mode control motor OK?

   YES—Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

   NO—Go to step 2.

2. Remove the mode control motor (see page 21-58).

3. Check the mode control linkage and doors for smooth movement.

   Do the mode control linkage and doors move smoothly?

   YES—Replace the mode control motor.■

   NO—Repair the mode control linkage on doors.■

BACK

Protected by AR

DTC indicator light N: A Problem in the Blower Motor Circuit

1. Check the No. 56 (40A) fuse in the under-hood fuse/relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

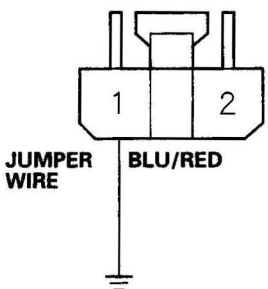
   Are the fuses OK?

   YES – Go to step 2.

   NO – Replace the fuse(s), and recheck. ■

2. Connect the No. 1 terminal of the blower motor 2P connector to body ground with a jumper wire.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

3. Turn the ignition switch ON (II).

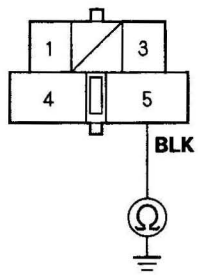
   Does the blower motor run?

   YES – Go to step 4.

   NO – Go to step 17.

4. Turn the ignition switch OFF.
5. Disconnect the jumper wire.
6. Disconnect the power transistor 5P connector.
7. Check for continuity between the No. 5 terminal of the power transistor 5P connector and body ground.

POWER TRANSISTOR 5P CONNECTOR



Wire side of female terminals

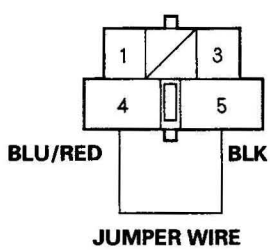
   Is there continuity?

   YES – Go to step 8.

   NO – Check for an open in the wire between the power transistor and body ground. If the wire is OK, check for poor ground at G401. ■

8. Connect the No. 4 and No. 5 terminals of the power transistor 5P connector with a jumper wire.

POWER TRANSISTOR 5P CONNECTOR



Wire side of female terminals

9. Turn the ignition switch ON (II).

   Does the blower motor run at high speed?

   YES – Go to step 10.

   NO – Repair open in the wire between the power transistor and blower motor. ■

10. Turn the ignition switch OFF.
11. Disconnect the jumper wire.

(cont'd)

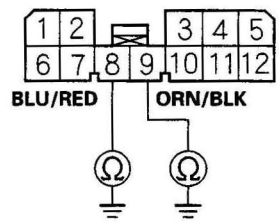
Protected by AR

DTC Troubleshooting (cont'd)

12. Disconnect climate control unit connector A (12P).

13. Check for continuity between the No. 8 and No. 9 terminals of climate control unit connector A (12P) and body ground individually.

CLIMATE CONTROL UNIT CONNECTOR A (12P)



Wire side of female terminals

Is there continuity?

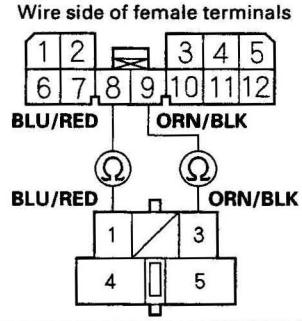
YES – Repair any short to body ground in the wire(s) between the climate control unit and the power transistor. ■

NO – Go to step 14.

14. Check for continuity between the following terminals of climate control unit connector A (12P) and power transistor 5P connector.

12P:	5P:
No. 8	No. 1
No. 9	No. 3

CLIMATE CONTROL UNIT CONNECTOR A (12P)
Wire side of female terminals



POWER TRANSISTOR 5P CONNECTOR
Wire side of female terminals

Is there continuity?

YES – Go to step 15.

NO – Repair any open in the wire(s) between the climate control unit and the power transistor. ■

15. Reconnect climate control unit connector A (12P).

16. Test the power transistor (see page 21-56).

Is the power transistor OK?

YES – Check for loose wires or poor connections at climate control unit connector A (12P) and at the power transistor 5P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

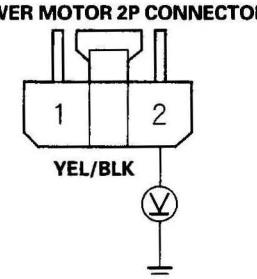
NO – Replace the power transistor. ■

17. Disconnect the jumper wire.

18. Disconnect the blower motor 2P connector.

19. Measure the voltage between the No. 2 terminal of the blower motor 2P connector and body ground.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Replace the blower motor. ■

NO – Go to step 20.

20. Turn the ignition switch OFF.

21. Remove the blower motor relay from the under-hood fuse/relay box, and test it (see page 22-103).

Is there relay OK?

YES – Go to step 22.

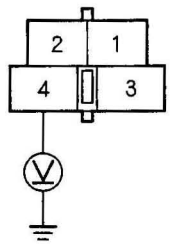
NO – Replace the blower motor relay. ■

BACK

Protected by AR

22. Measure the voltage between the No. 4 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there battery voltage?

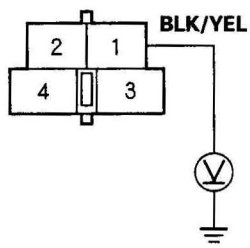
YES – Go to step 23.

NO – Replace the under-hood fuse/relay box. ■

23. Turn the ignition switch ON (II).

24. Measure the voltage between the No.1 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there battery voltage?

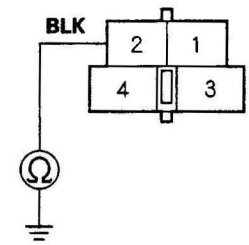
YES – Go to step 25.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the blower motor relay. ■

25. Turn the ignition switch OFF.

26. Check for continuity between the No. 2 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there contnuity?

YES – Repair open in the wire between the blower motor relay and the blower motor. ■

NO – Check for an open in the wire between the blower motor relay and body ground. If the wire is OK, check for poor ground at G202. ■

Protected by AR

Recirculation Control Motor Circuit Troubleshooting

1. Check the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuses OK?

   YES – Go to step 2.

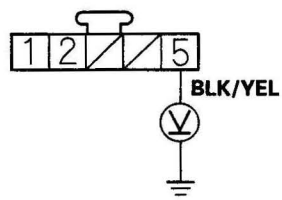
   NO – Replace the fuse, and recheck. ■

2. Disconnect the recirculation control motor 5P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 5 terminal of the recirculation control motor 5P connector and body ground.

   RECIRCULATION CONTROL MOTOR 5P CONNECTOR



   Wire side of female terminals

   Is there battery voltage?

   YES – Go to step 5.

   NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the recirculation control motor. ■

5. Turn the ignition switch OFF.

6. Test the recirculation control motor (see page 21-59).

   Is the recirculation control motor OK?

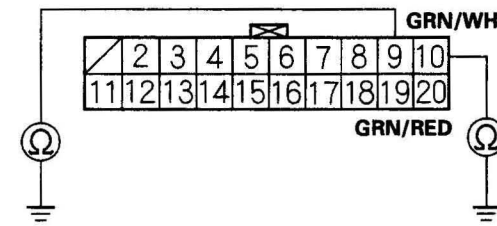
   YES – Go to step 7.

   NO – Go to step 12.

7. Disconnect climate control unit connector B (20P).

8. Check for continuity between the No. 9 and No. 10 terminals of climate control unit connector B (20P) and body ground individually.

   CLIMATE CONTROL UNIT CONNECTOR B (20P)



   Wire side of female terminals

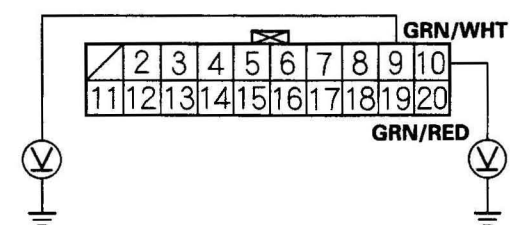
   Is there continuity?

   YES – Repair any short to body ground in the wire(s) between the climate control unit and the recirculation control motor. ■

   NO – Go to step 9.

9. Turn the ignition switch ON (II), and check the same wires for voltage.

   CLIMATE CONTROL UNIT CONNECTOR B (20P)



   Wire side of female terminals

   Is there any voltage?

   YES – Repair short to power in the wire between the climate control unit and the recirculation control motor. This short also damages the climate control unit. Repair the short to power before replacing the climate control unit. ■

   NO – Go to step 10.

BACK

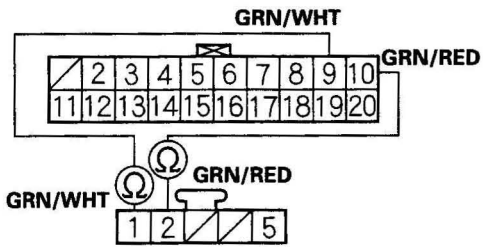
Protected by AR

10. Turn the ignition switch OFF.

11. Check for continuity between the following terminals of climate control unit connector B (20P) and the recirculation control motor 5P connector.

20P:	5P:
No. 9	No. 1
No. 10	No. 2

CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals



RECIRCULATION CONTROL MOTOR 5P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Check for loose wires or poor connections at climate control unit connector B (20P) and at recirculation control motor 5P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

NO—Repair any open in the wire(s) between the climate control unit and the recirculation control motor.■

12. Remove the recirculation contol motor (see page 21-59).

13. Check the recirculation control linkage and doors for smooth movement.

Do the recirculation control linkage and doors move smoothly?

YES—Replace the recirculation control motor.■

NO—Repair the recirculation control linkage or doors.■

1. Check the malfunction indicator lamp (MIL).

Does the malfunction indicator lamp come on?

YES—Refer to the fuel and emissions section (see page 11-3).■

NO—Go to step 2.

2. Turn the ignition switch OFF.

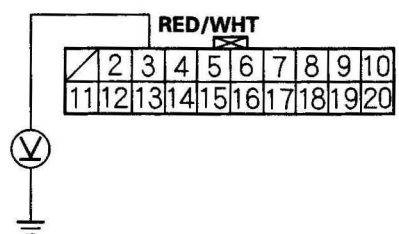
3. Disconnect the ECT sensor 2P connector (see page 11-93).

4. Disconnect climate control unit connector B (20P).

5. Turn the ignition switch ON (II).

6. Measure the voltage between the No. 3 terminal of climate control unit connector B (20P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there about 5 V?

YES—Check for loose wires or poor connections at climate control unit connector B (20P) and at the ECT sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

NO—Repair open in the wire between the climate control unit and the ECT sensor.■

Protected by AR

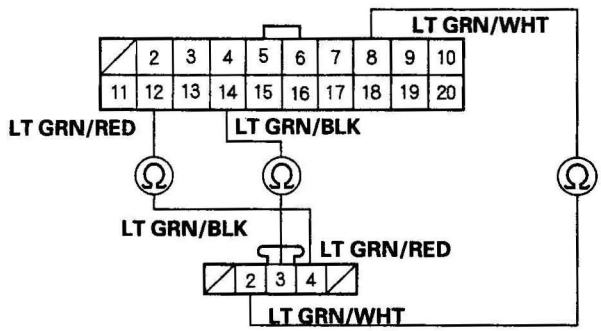
Communication Line Circuit Troubleshooting

With Navigation System

1. Disconnect navigation display unit connector A (5P).
2. Disconnect climate control unit connector B (20P).
3. Check for continuity between the following terminals of the climate control unit connector B (20P) and navigation display unit connector A (5P).

20P	5P
No. 8	No. 2
No. 12	No. 4
No. 14	No. 3

CLIMATE CONTROL UNIT CONNECTOR B (20P)
Wire side of female terminals



NAVIGATION DISPLAY UNIT CONNECTOR A (5P)
Wire side of female terminals

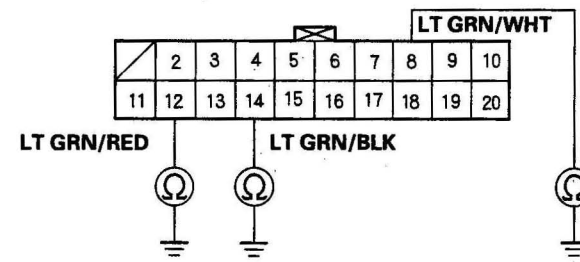
Is there continuity?

YES – Go to step 4.

NO – Repair any open in the wire(s) between the climate control unit and the navigation display unit. ■

4. Check for continuity between the body ground and climate control unit connector B (20P) terminals No. 8, 12 and 14 individually.

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there continuity?

YES – Repair any short to body ground in the wire(s) between the climate control unit and the navigation display unit. ■

NO – Check for loose wires or poor connections at climate control unit connector B (20P) and at navigation display unit connector A (5P). If the connections are good, substitute a known-good climate control unit. If the problem still exists, replace the navigation display unit. ■

BACK

Protected by AR

Climate Control Power and Ground Circuits Troubleshooting

1. Check the No. 54 (40A) fuse in the under-hood fuse/relay box, the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box, and the No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box.

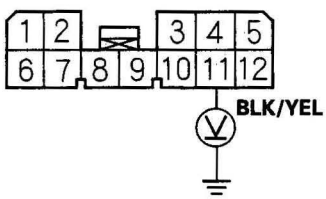
   Are the fuses OK?

   YES – Go to step 2.

   NO – Replace the fuse(s), and recheck. ■

2. Disconnect climate control unit connector A (12P).
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 11 terminal of climate control unit connector A (12P) and body ground.

   CLIMATE CONTROL UNIT CONNECTOR A (12P)



Wire side of female terminals

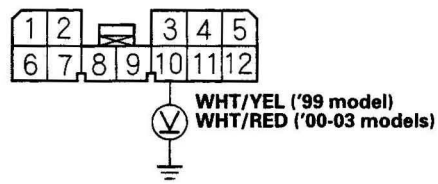
   Is there battery voltage?

   YES – Go to step 5.

   NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the climate control unit. ■

5. Turn the ignition switch OFF.
6. Measure the voltage between the No. 10 terminal of climate control unit connector A (12P) and body ground.

   CLIMATE CONTROL UNIT CONNECTOR A (12P)



Wire side of female terminals

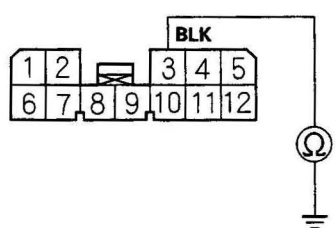
   Is there battery voltage?

   YES – Go to step 7.

   NO – Repair open in the wire between the No. 13 fuse in the passenger's under-dash fuse/relay box and the climate control unit. ■

7. Check for continuity between the No. 3 terminal of climate control unit connector A (12P) and body ground.

   CLIMATE CONTROL UNIT CONNECTOR A (12P)



Wire side of female terminals

   Is there continuity?

   YES – Check for loose wires or poor connections at climate control unit connector A (12P). If the connections are good,substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

   NO – Check for an open in the wire between the climate control unit and body ground. If the wire is OK, check for poor ground at G401. ■

BACK

Protected by AR

Radiator and Condenser Fans Low Speed Circuit Troubleshooting

Type S Model

1. Check the No. 58 (30A) fuse in the under-hood fuse/relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Are the fuses OK?

   YES – Go to step 2.

   NO – Replace the fuse(s), and recheck. ■

2. Remove the condenser fan relay from the under-hood fuse/relay box, and test it (see page 22-103).

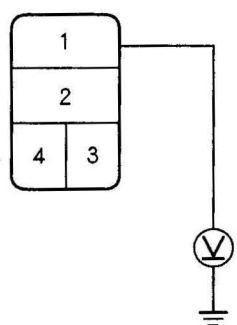
   Is the relay OK?

   YES – Go to step 3.

   NO – Replace the condenser fan relay. ■

3. Measure the voltage between the No. 1 terminal of the condenser fan relay 4P socket and body ground.

   CONDENSER FAN RELAY 4P SOCKET



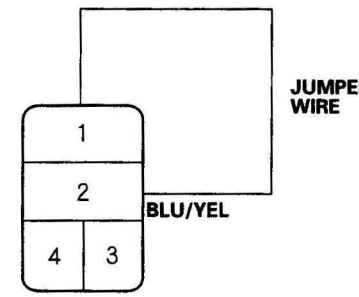
   Is there battery voltage?

   YES – Go to step 4.

   NO – Replace the under-hood fuse/relay box. ■

4. Connect the No. 1 and No. 2 terminals of the condenser fan relay 4P socket with a jumper wire.

   CONDENSER FAN RELAY 4P SOCKET



   Does the condenser fan run?

   YES – Go to step 5.

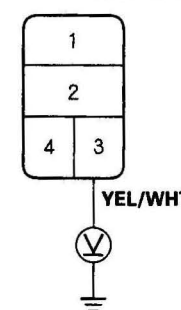
   NO – Go to step 14.

5. Disconnect the jumper wire.

6. Turn the ignition switch ON (II).

7. Measure the voltage between the No.3 terminal of the condenser fan relay 4P socket and body ground.

   CONDENSER FAN RELAY 4P SOCKET



   Is there battery voltage?

   YES – Go to step 8.

   NO – Go to step 32.

8. Turn the ignition switch OFF.

9. Reinstall the condenser fan relay.

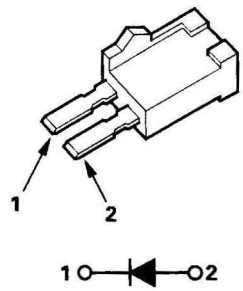
10. Remove A/C diode A from the right side of dash.

BACK

Protected by AR

11. Check for current flow in both directions between the No. 1 and No. 2 terminals of A/C diode A.

A/C DIODE A



Is there current flow in only one direction?

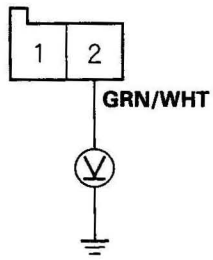
YES – Go to step 12.

NO – Replace A/C diode A. ■

12. Turn the ignition switch ON (II).

13. Measure the voltage between the No. 2 terminal of A/C diode A 2P connector and body ground.

A/C DIODE A 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Repair open in the wire between A/C diode A and the A/C pressure switch. ■

NO – Repair open in the wire between the condenser fan relay and A/C diode A. ■

14. Disconnect the jumper wire.

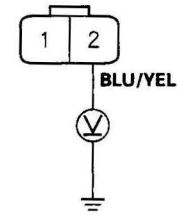
15. Reinstall the condenser fan relay.

16. Disconnect the condenser fan 2P connector.

17. Turn the ignition switch ON (II), then turn the A/C and fan switches ON.

18. Measure the voltage between the No. 2 terminal of the condenser fan 2P connector and body ground.

CONDENSER FAN 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 19.

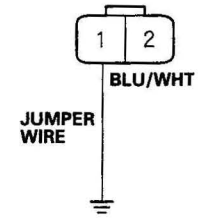
NO – Repair open in the wire between the condenser fan relay and the condenser fan. ■

19. Turn the A/C and fan switches OFF, then turn the ignition switch OFF.

20. Reconnect the condenser fan 2P connector.

21. Connect the No.1 terminal of the condenser fan 2P connector to body ground with jumper wire.

CONDENSER FAN 2P CONNECTOR



Wire side of female terminals

22. Turn the ignition switch ON (II), then turn the A/C and fan switches ON.

Does the condenser fan run?

YES – Go to step 23.

NO – Replace the condenser fan motor. ■

(cont'd)

Protected by AR

Radiator and Condenser Fans Low Speed Circuit Troubleshooting (cont'd)

23. Turn the A/C and fan switches OFF, then turn the ignition switch OFF.

24. Disconnect the jumper wire.

25. Remove the fan control relay from the multi-relay box, and test it (see page 22-103).

    Is the relay OK?

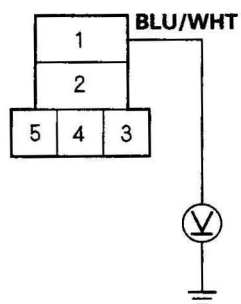
    YES – Go to step 26.

    NO – Replace the fan control relay. ■

26. Turn the ignition switch ON (II), then turn the A/C and fan switches ON.

27. Measure the voltage between the No. 1 terminal of the fan control relay 5P socket and body ground.

FAN CONTROL RELAY 5P SOCKET



Is there battery voltage?

YES – Go to step 28.

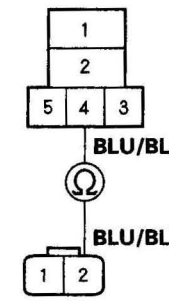
NO – Repair open in the wire between the condenser fan and the fan control relay. ■

28. Turn the A/C and fan switches OFF, then turn the ignition switch OFF.

29. Disconnect the radiator fan 2P connector.

30. Check for continuity between the No. 4 terminal of the fan control relay 5P socket and the No. 2 terminal of the radiator fan 2P connector.

FAN CONTROL RELAY 5P SOCKET



RADIATOR FAN 2P CONNECTOR
Wire side of female terminals

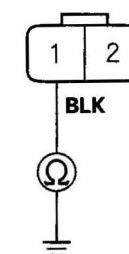
Is there continuity?

YES – Go to step 31.

NO – Repair open in the wire between the fan control relay and the radiator fan. ■

31. Check for continuity between the No. 1 terminal of the radiator fan 2P connector and body ground.

RADIATOR FAN 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Replace the radiator fan motor. ■

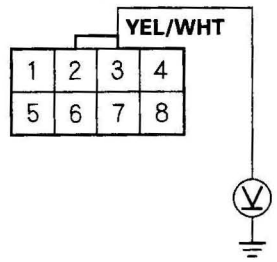
NO – Check for an open in the wire between the radiator fan and body ground. If the wire is OK, check for poor ground at G201. ■

BACK

Protected by AR

32. Measure the voltage between the No. 3 terminal of the radiator fan control module 8P connector and body ground with the 8P connector connected.

RADIATOR FAN CONTROL MODULE 8P CONNECTOR



Wire side of female terminals

Is the battery voltage?

YES – Repair open in the wire between the condenser fan relay and the radiator fan control module. ■

NO – Perform the radiator and condenser fans circuit troubleshooting A (see page 10-25). ■

Condenser Fan High Speed Circuit Troubleshooting

Type S Model

1. Check the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse, and recheck. ■

2. Remove the fan control relay from the multi-relay box, and test it (see page 22-103).

   Is the relay OK?

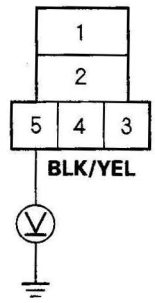
   YES – Go to step 3.

   NO – Replace the fan control relay. ■

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 5 terminal of the fan control relay 5P socket and body ground.

FAN CONTROL RELAY 5P SOCKET



Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the fan control relay. ■

5. Turn the ignition switch OFF.

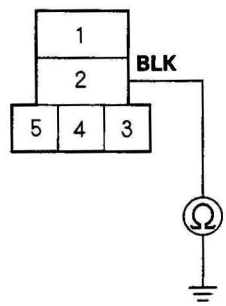
(cont'd)

Protected by AR

Condenser Fan High Speed Circuit Troubleshooting (cont'd)

6. Check for continuity between the No. 2 terminal of the fan control relay 5P socket and body ground.

FAN CONTROL RELAY 5P SOCKET



Is there continuity?

YES – Repair open in the wire between the fan control relay and A/C diode B. ■

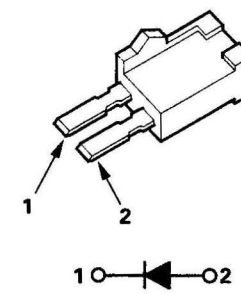
NO – Check for an open in the wire between the fan control relay and body ground. If the wire is OK, check for poor ground at G302. ■

Radiator and Condenser Fans High Speed Circuit Troubleshooting

Type S Model

1. Remove A/C diode B from the right side of the under-dashboard area.
2. Check for current flow in both directions between the No. 1 and No. 2 terminals of A/C diode B.

A/C DIODE B



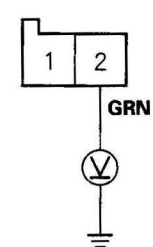
Is there current flow in only one direction?

YES – Go to step 3.

NO – Replace A/C diode B. ■

3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 2 terminal of A/C diode B 2P connector and body ground.

A/C DIODE B 2P SOCKET



Wire side of female terminals

Is there battery voltage?

YES – Go to step 5.

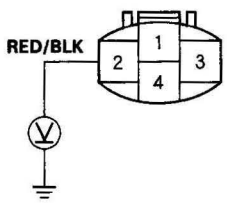
NO – Repair open in the wire between the radiator fan relay and A/C diode B. ■

BACK

Protected by AR

5. Turn the ignition switch OFF.
6. Reinstall A/C diode B.
7. Disconnect the A/C pressure switch 4P connector.
8. Turn the ignition switch ON (II).
9. Measure the voltage between the No. 2 terminal of the A/C pressure switch 4P connector and body ground.

A/C PRESSURE SWITCH 4P CONNECTOR



Wire side of female terminals

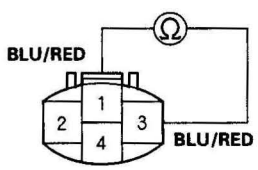
Is there battery voltage?

YES – Go to step 10.

NO – Repair open in the wire between A/C diode B and the A/C pressure switch. ■

10. Turn the ignition switch OFF.
11. Check for continuity between the No. 1 and No. 3 terminals of the A/C pressure switch 4P connector.

A/C PRESSURE SWITCH 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Replace the A/C pressure switch. ■

NO – Repair open in the wire between the A/C pressure switch A and B. ■

Condenser Fan Circuit Troubleshooting

Except Type S Model

1. Check the No. 58 (20A) fuse in the under-hood fuse/relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Are the fuses OK?

   YES – Go to step 2.

   NO – Replace the fuse(s), and recheck. ■

2. Remove the condenser fan relay from the under-hood fuse/relay box, and test it (see page 22-103).

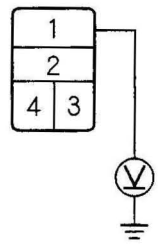
   Is the relay OK?

   YES – Go to step 3.

   NO – Replace the condenser fan relay. ■

3. Measure the voltage between the No. 1 terminal of the condenser fan relay 4P socket and body ground.

CONDENSER FAN RELAY 4P SOCKET



Is there battery voltage?

YES – Go to step 4.

NO – Replace the under-hood fuse/relay box. ■

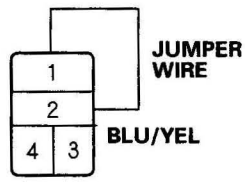
(cont'd)

Protected by AR

Condenser Fan Circuit Troubleshooting (cont'd)

4. Connect the No. 1 and No. 2 terminals of the condenser fan relay 4P socket with a jumper wire.

CONDENSER FAN RELAY 4P SOCKET



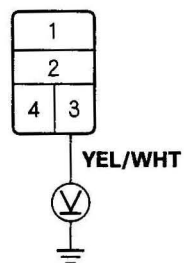
Does the condenser fan run?

YES—Go to step 5.

NO—Go to step 9.

5. Disconnect the jumper wire.
6. Turn the ignition switch ON (II).
7. Measure the voltage between the No. 3 terminal of the condenser fan relay 4P socket and body ground.

CONDENSER FAN RELAY 4P SOCKET



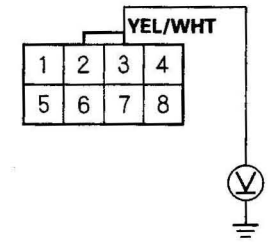
Is there battery voltage?

YES—Replace the under-hood fuse/relay box.■

NO—Go to step 8.

8. Measure the voltage between the No. 3 terminal of the radiator fan control module 8P connector and body ground with the 8P connector connected.

RADIATOR FAN CONTROL MODULE 8P CONNECTOR



Wire side of female terminals

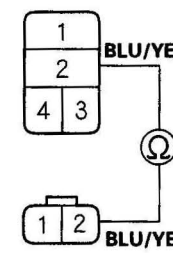
Is there battery voltage?

YES—Repair open in the wire between the condenser fan relay and the radiator fan control module.■

NO—Perform the radiator and condenser fans circuit troubleshooting A (see page 10-25).■

9. Disconnect the jumper wire.
10. Disconnect the condenser fan 2P connector.
11. Check for continuity between the No. 2 terminal of the condenser fan relay 4P socket and the No. 2 terminal of the condenser fan 2P connector.

CONDENSER FAN RELAY 4P SOCKET



CONDENSER FAN 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Go to step 12.

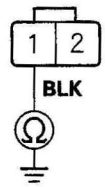
NO—Repair open in the wire between the condenser fan relay and the condenser fan.■

BACK

Protected by AR

12. Check for continuity between the No. 1 terminal of the condenser fan 2P connector and body ground.

CONDENSER FAN 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Replace the condenser fan motor. ■

NO – Check for an open in the wire between the condenser fan and body ground. If the wire is OK, check for poor ground at G201. ■

Radiator and Condenser Fans Common Circuit Troubleshooting

Except Type S Model

1. Check the No. 57 (20A), No. 58 (20A) fuses in the under-hood fuse/relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Are the fuses OK?

   YES – Go to step 2.

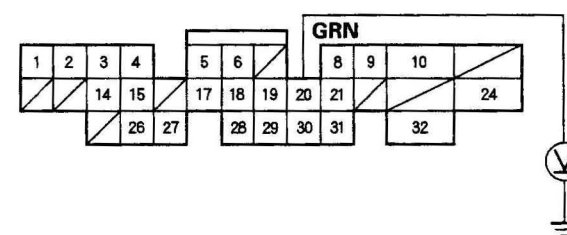
   NO – Replace the fuse(s), and recheck. ■

2. Make sure the A/C switch is OFF.

3. Turn the ignition switch ON (II).

4. Using a Backprobe Set, measure the voltage between the No. 20 terminal of PCM connector A (32P) and body ground with the PCM connectors connected.

PCM CONNECTOR A(32P)



Wire side of female terminals

Is there battery voltage?

YES – Check for loose wire or poor connections at PCM connector A(32P).If the connections are good, substitute a known-good PCM,and recheck. If the symptom/indication goes away,replace the original PCM. ■

NO – Repair open in the wire between the radiator fan relay, the condenser fan relay and the PCM. ■

Protected by AR

Compressor Clutch Circuit Troubleshooting

Type S Model

1. Check the No. 58 (30A) fuse in the under-hood fuse/relay box, No. 14 (7.5A) in the passenger's under-dash fuse/relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Are the fuses OK?

   YES – Go to step 2.

   NO – Replace the fuse(s), and recheck. ■

2. Check the engine coolant temperature.

   Is the coolant temperature above normal?

   YES – Troubleshoot and repair cause of high engine coolant temperature. ■

   NO – Go to step 3.

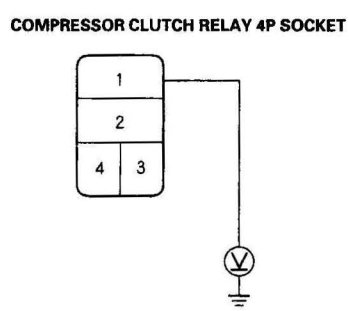
3. Remove the compressor clutch relay from the under-hood fuse/relay box, and test it (see page 22-103).

   Is the relay OK?

   YES – Go to step 4.

   NO – Replace the compressor clutch relay. ■

4. Measure the voltage between the No.1 terminal of the compressor clutch relay 4P socket and body ground.

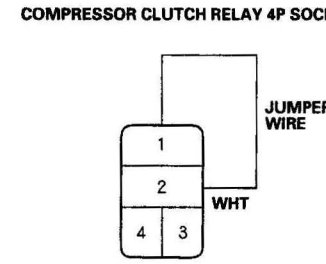


   Is there battery voltage?

   YES – Go to step 5.

   NO – Replace the under-hood fuse/relay box. ■

5. Connect the No. 1 and No. 2 terminals of the compressor clutch relay 4P socket with a jumper wire.



   Does the compressor clutch click ?

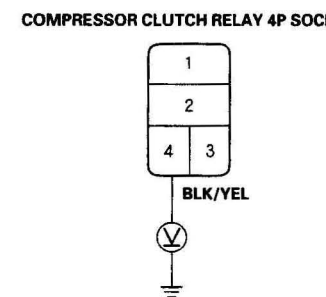
   YES – Go to step 6.

   NO – Go to step 15.

6. Disconnect the jumper wire.

7. Turn the ignition switch ON (II).

8. Measure the voltage between the No. 4 terminal of the compressor clutch relay 4P socket and body ground.



   Is there battery voltage?

   YES – Go to step 9.

   NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the compressor clutch relay. ■

9. Turn the ignition switch OFF.

10. Reinstall the compressor clutch relay.

11. Make sure the A/C switch is OFF.

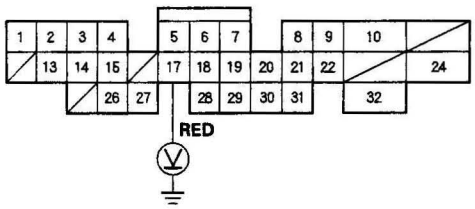
BACK

Protected by AR

12. Turn the ignition switch ON (II).

13. Using the Backprobe Set, measure the voltage between the No. 17 terminal of PCM connector A (32P) and body ground with the PCM connectors connected.

PCM CONNECTOR A (32P)



Wire side of female terminals

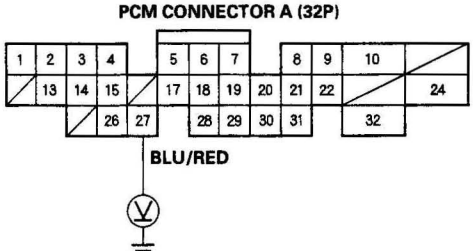
Is there battery voltage?

YES – Go to step 14.

NO – Repair open in the wire between the compressor clutch relay and the PCM. ■

14. Using the Backprobe Set, measure the voltage between the No. 27 terminal of PCM connector A (32P) and body ground with the PCM connectors connected.

PCM CONNECTOR A (32P)



Wire side of female terminals

Is there battery voltage?

YES – Check for loose wires or poor connections at PCM connector A (32P). If the connections are good, substitute a known-good PCM, and recheck. If the symptom/indication goes away, replace the original PCM. ■

NO – Repair open in the wire between the PCM and the A/C pressure switch. ■

15. Disconnect the jumper wire.

16. Reinstall the compressor clutch relay.

17. Check the No. 14 (7.5A) fuse in the passenger's under-dash fuse/relay box.

Is the fuses OK?

YES – Go to step 18.

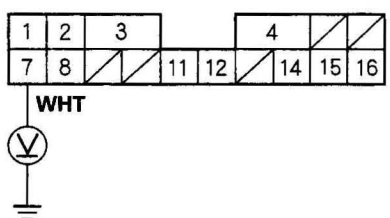
NO – Replace the fuse, and recheck. ■

18. Disconnect the passenger's under-dash fuse/relay box 16P connector.

19. Turn the ignition switch ON (II), then turn the A/C and fan switches ON.

20. Measure the voltage between the No. 7 terminal of the passenger's under-dash fuse/relay box 16P connector and body ground.

PASSENGER'S UNDER-DASH FUSE/ RELAY BOX 16P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 21.

NO – Repair open in the wire between the No. 14 fuse in the passenger's under-dash fuse/relay box and the compressor clutch relay. ■

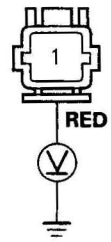
(cont'd)

Protected by AR

Compressor Clutch Circuit Troubleshooting (cont'd)

21. Turn the ignition switch OFF.
22. Reconnect the passenger's under-dash fuse/relay box 16P connector.
23. Disconnect the compressor clutch 1P connector.
24. Turn the ignition switch ON (II), then turn the A/C and fan switches ON.
25. Measure the voltage between the No. 1 terminal of the compressor clutch 1P connector and body ground.

COMPRESSOR CLUTCH 1P CONNECTOR



Terminal side of male terminals

Is there battery voltage?

YES – Check the compressor clutch clearance and the compressor clutch field coil. ■

NO – Repair open in the wire between the No. 14 fuse in the passenger's under-dash fuse/relay box and compressor clutch. ■

Except Type S Model

1. Check the No. 58 (20A) fuse in the under-hood fuse/relay box, and the No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Are the fuses OK?

   YES – Go to step 2.

   NO – Replace the fuse(s), and recheck. ■

2. Check the engine coolant temperature (Use the Honda PGM Tester PGM-FI data list if possible).

   Is the coolant temperature above nomal?

   YES – Troubleshoot and repair cause of high engine coolant temperature. ■

   NO – Go to step 3.

3. Remove the compressor clutch relay from the under-hood fuse/relay box, and test it (see page 22-103).

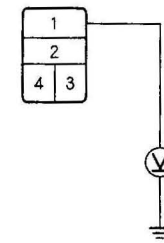
   Is the relay OK?

   YES – Go to step 4.

   NO – Replace the compressor clutch relay. ■

4. Measure the voltage between the No. 1 terminal of the compressor clutch relay 4P socket and body ground.

COMPRESSOR CLUTCH RELAY 4P SOCKET



Is there battery voltage?

YES – Go to step 5.

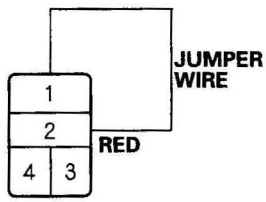
NO – Replace the under-hood fuse/relay box. ■

BACK

Protected by AR

5. Connect the No. 1 and No. 2 terminals of the compressor clutch relay 4P socket with a jumper wire.

COMPRESSOR CLUTCH RELAY 4P SOCKET



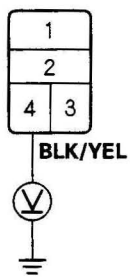
Does the compressor clutch click?

YES – Go to step 6.

NO – Go to step 13.

6. Disconnect the jumper wire.
7. Turn the ignition switch ON (II).
8. Measure the voltage between the No. 4 terminal of the compressor clutch relay 4P socket and body ground.

COMPRESSOR CLUTCH RELAY 4P SOCKET



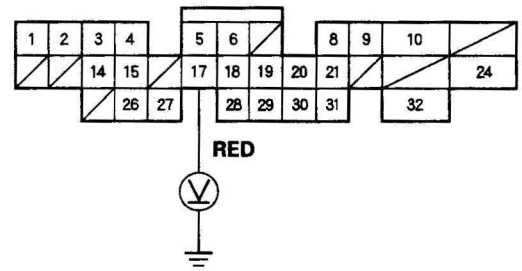
Is there battery voltage?

YES – Go to step 9.

NO – Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the compressor clutch relay. ■

9. Turn the ignition switch OFF.
10. Reinstall the compressor clutch relay.
11. Make sure the A/C switch is OFF.
12. Using the Backprobe Set, measure the voltage between the No. 17 terminal of PCM connector A (32P) and body ground with the PCM connectors connected.

PCM CONNECTOR A(32P)



Wire side of female terminals

Is there battery voltage?

YES – Check for loose wire or poor connections at PCM connector A (32P). If the connections are good, substitute a known-good PCM, and recheck. If the symptom/indication goes away, replace the original PCM. ■

NO – Repair open in the wire between the compressor clutch relay and the PCM. ■

13. Disconnect the jumper wire.
14. Disconnect the compressor clutch 1P connector.

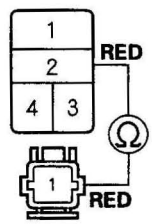
(cont'd)

Protected by AR

Compressor Clutch Circuit Troubleshooting (cont'd)

15. Check for continuity between the No. 2 terminal of the compressor clutch relay 4P socket and the No. 1 terminal of the compressor clutch 1P connector.

COMPRESSOR CLUTCH RELAY 4P SOCKET



COMPRESSOR CLUTCH 1P CONNECTOR
Terminal side of male terminals

Is there continuity?

YES—Check the compressor clutch clearance and the compressor clutch field coil (see page 21-71). ■

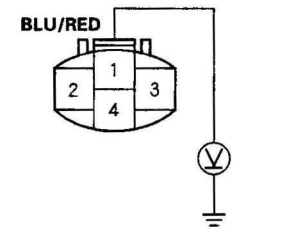
NO—Repair open in the wire between the compressor clutch relay and the compressor clutch. ■

A/C Pressure Switch Circuit Troubleshooting

Type S Model

1. Disconnect the A/C pressure switch 4P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the No. 1 terminal of the A/C presure switch 4P connector and body ground.

A/C PRESSURE SWITCH 4P CONNECTOR



Wire side of female terminals

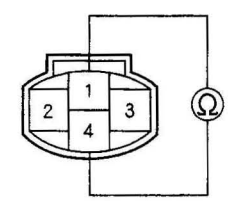
Is there battery voltage?

YES—Go to step 4.

NO—Repair the open in the wire between A/C diode A, the PCM, and the A/C pressure switch. ■

4. Turn the ignition switch OFF.
5. Check for continuity between the No. 1 and No. 4 terminals of the A/C pressure switch.

A/C PRESSURE SWITCH



Is there continuity?

YES—Go to step 6.

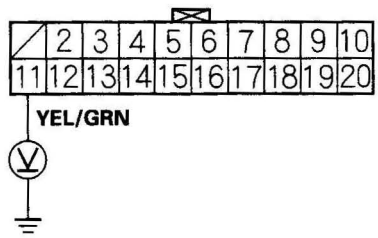
NO—Go to step 10.

BACK

Protected by AR

6. Reconnect the A/C pressure switch 4P connector.
7. Disconnect climate control unit connector B (20P).
8. Turn the ignition switch ON (II).
9. Measure the voltage between the No. 11 terminal of climate control unit connector B (20P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there battery voltage?

YES – Check for loose wires or poor connections at climate control unit connector B (20P) and at the A/C pressure switch 4P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO – Repair the open in the wire between the climate control unit and the A/C pressure switch. ■

10. Check for proper A/C system pressure.

Is the pressure within specifications?

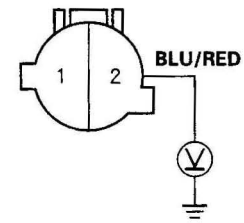
YES – Replace the A/C pressure switch. ■

NO – Repair the A/C pressure problem. ■

Except Type S Model

1. Disconnect the A/C pressure switch 2P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the No. 2 terminal of the A/C presure switch 2P connector and body ground.

A/C PRESSURE SWITCH 2P CONNECTOR



Wire side of female terminals

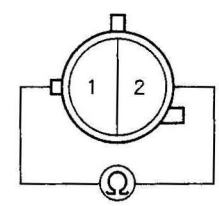
Is there about 5 V?

YES – Go to step 4.

NO – Go to step 10.

4. Turn the ignition switch OFF.
5. Check for continuity between the No. 1 and No. 2 terminals of the A/C pressure switch.

A/C PRESSURE SWITCH



Is there continuity?

YES – Go to step 6.

NO – Go to step 11.

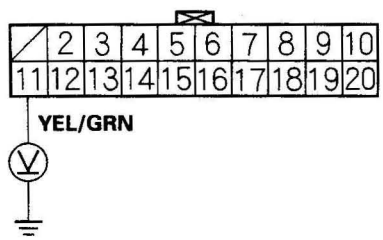
(cont'd)

Protected by AR

A/C Pressure Switch Circuit Troubleshooting (cont'd)

6. Reconnect the A/C pressure switch 2P connector.
7. Disconnect climate control unit connector B (20P).
8. Turn the ignition switch ON (II).
9. Measure the voltage between the No. 11 terminal of climate control unit connector B (20P) and body ground.

CLIMATE CONTROL UNIT CONNECTOR B (20P)



Wire side of female terminals

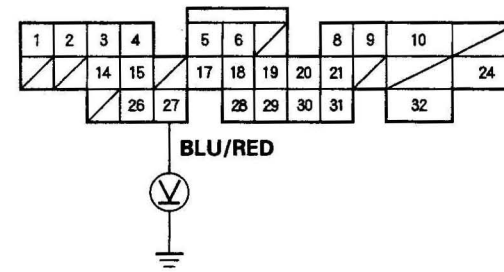
Is there about 5 V?

YES – Check for loose wires or poor connections at climate control unit connector B (20P) and at the A/C pressure switch 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit. ■

NO – Repair open in the wire between the climate control unit and the A/C pressure switch. ■

10. Using a Backprobe Set, measure the voltage between the No. 27 terminal of PCM connector A (32P) and body ground with the PCM connectors connected.

PCM CONNECTOR A(32P)



Wire side of female terminals

Is there about 5 V?

YES – Repair open in the wire between the PCM and the A/C pressure switch. ■

NO – Check for loose wires or poor connections at PCM connector A (32P). If the connections are good, substitute a known-good PCM, and recheck. If the symptom/indication goes away, replace the original PCM. ■

11. Check for proper A/C system pressure.

Is the pressure within specifications?

YES – Replace the A/C pressure switch. ■

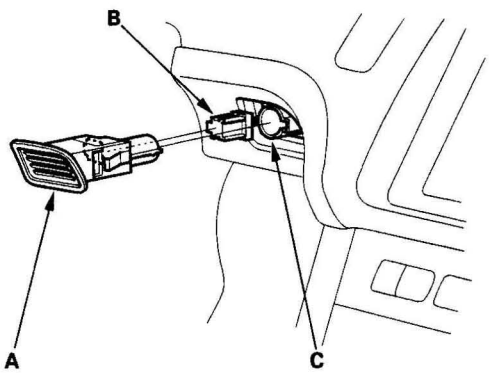
NO – Repair the A/C pressure problem. ■

BACK

Protected by AR

In-car Temperature Sensor Replacement

1. Remove the in-car temperature sensor (A) from the dashboard, then disconnect the 2P connector (B) and the air hose (C). Be careful not to damage the sensor or the dashboard.



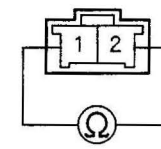
2. Install the sensor in the reverse order of removal. Be sure to connect the air hose securely.

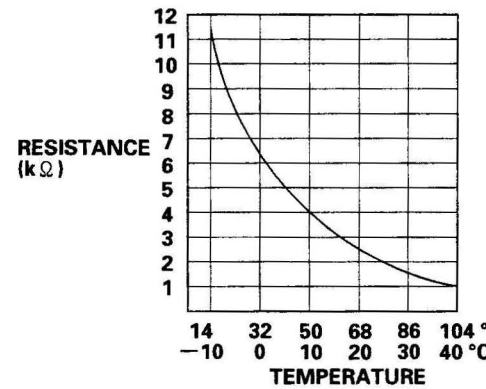
In-car Temperature Sensor Test

Check for a change in resistance by heating or cooling the sensor with a hair drier.

Compare the resistance reading between the No. 1 and No. 2 terminals of the in-car temperature sensor with the specifications shown in the graph; the resistance should be within the specifications.

IN-CAR TEMPERATURE SENSOR

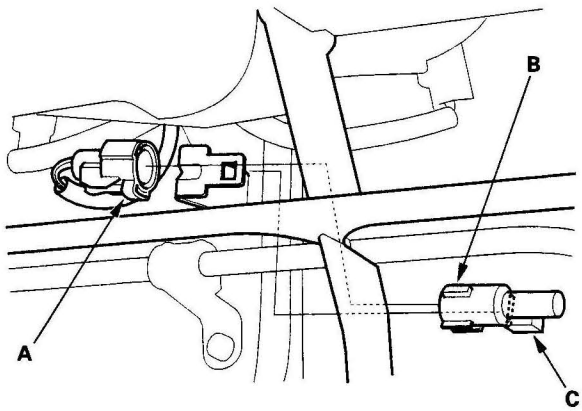




Protected by AR

Outside Air Temperature Sensor Replacement

1. Disconnect the 2P connector (A) from the outside air temperature sensor(B). Lift the tab (C) to release the lock, and remove the outside air temperature sensor.



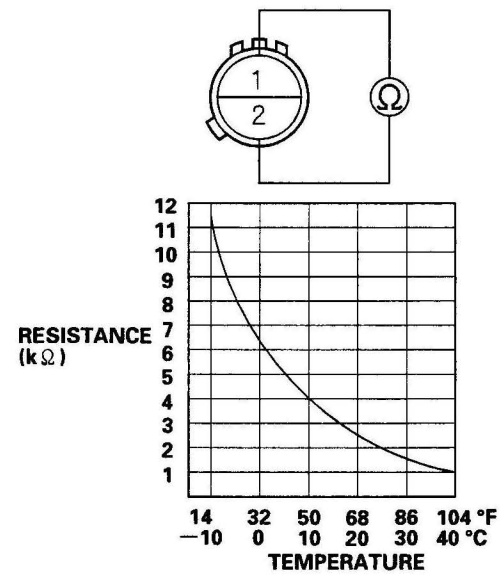
2. Install the sensor in the reverse order of removal.

Outside Air Temperature Sensor Test

Dip the sensor in ice water, and measure the resistance. Then pour hot water on the sensor, and check for a change in resistance.

Compare the resistance reading between the No. 1 and No. 2 terminals of the outside air temperature sensor with the specifications shown in the graph; the resistance should be within the specifications.

OUTSIDE AIR TEMPERATURE SENSOR

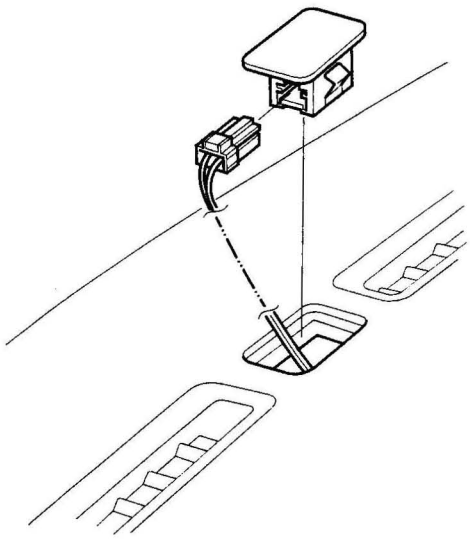


BACK

Protected by AR

Sunlight Sensor Replacement

1. Remove the sunlight sensor from the dashboard, then disconnect the 2P connector. Be careful not to damage the sensor or the dashboard.

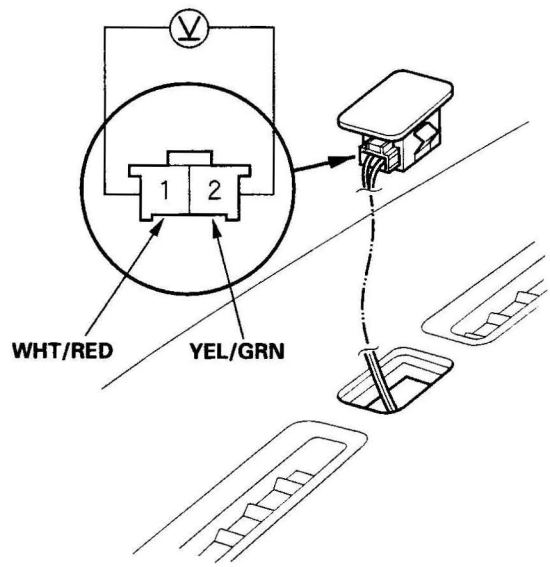


2. Install the sensor in the reverse order of removal.

Sunlight Sensor Test

Turn the ignition switch ON (II). Measure the voltage between the terminals with the (+) probe on the No. 1 terminal and the (−) probe on the No. 2 terminal with the 2P connector connected. The voltage will not change under the light of a flashlight or a fluorescent lamp. Voltage should be:

- 3.6−3.7 V or more with the sensor out of direct sunlight.
- 3.3−3.5 V or less with the sensor in direct sunlight.

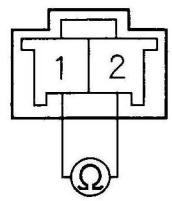


Protected by AR

Evaporator Temperature Sensor Test

1. Dip the sensor in ice water, and measure the resistance between its terminals.

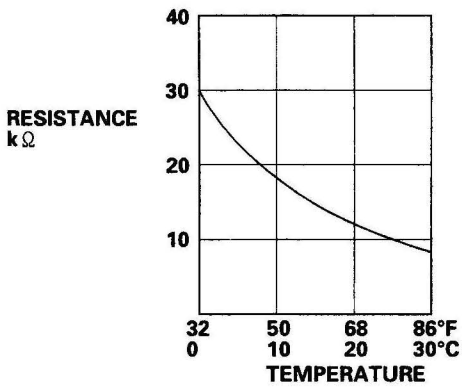
EVAPORATOR TEMPERATURE SENSOR



Terminal side of male terminals

2. Then pour hot water on the sensor, and check for a change in resistance.

3. Compare the resistance readings with the specifications shown in the graph; the resistance should be within the specifications.



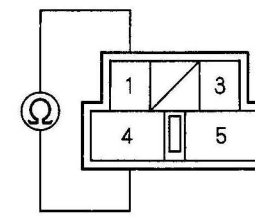
Power Transistor Test

1. Disconnect the 5P connector from the power transistor.

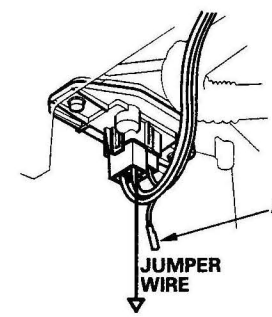
2. Measure the resistance between the No. 1 and No. 4 terminals of the power transistor. It should be about 1.4 — 1.5 kΩ.

   - If the resistance is within the specifications, go to step 3.
   - If the resistance is not within the specifications, replace the power transistor.

POWER TRANSISTOR



3. Carefully release the lock tab on the No. 3 terminal (ORN/BLK) (A) in the 5P connector, then remove the terminal and insulate it from body ground.



(To 12 V power source on vehicle)

4. Reconnect the 5P connector to the power transistor.

5. Supply 12 volts to the No. 3 cavity with a jumper wire.

6. Turn the ignition switch ON (II), and check that the blower motor runs.

   - If the blower motor does not run, replace the power transistor.
   - If the blower motor runs, replace the climate control unit.

BACK

Protected by AR

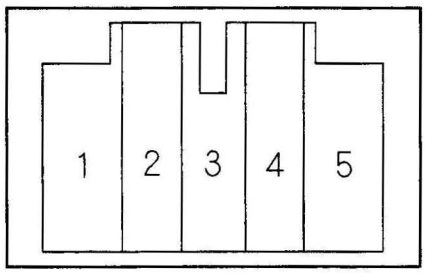
Air Mix Control Motor Test

1. Disconnect the 5P connector from the air mix control motor.

2. Connect battery power to the No. 1 terminal of the air mix control motor, and ground the No. 2 terminal; the air mix control motor should run, and stop at Max Hot. If it doesn't, reverse the connections; the air mix control motor should run, and stop at Max Cool. If the air mix control motor does not run, remove it, then check the air mix control linkage and door for smooth movement.

   - If the linkage and door move smoothly, replace the air mix control motor.
   - If the linkage or door sticks or binds, repair them as needed.

AIR MIX CONTROL MOTOR



3. Measure the resistance between the No. 4 and No. 5 terminals. It should be between 2.1 k to 3.9 kΩ.

4. Reconnect the air mix control motor 5P connector, then turn the ignition switch ON (II).

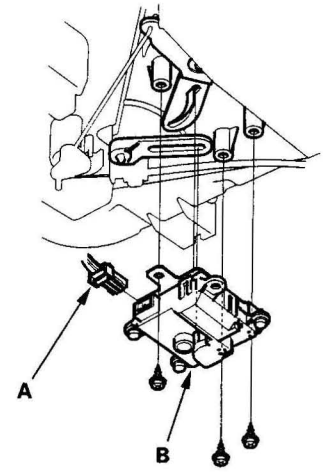
5. Measure the voltage between the No. 3 and No. 5 terminals.

   Max Cool – about 1 V
   Max Hot – about 4 V

6. If either the resistance or voltage readings are not as specified, replace the air mix control motor.

Air Mix Control Motor Replacement

1. Disconnect the 5P connector (A) from the air mix control motor (B). Remove the self-tapping screws and the air mix control motor from the heater unit.



2. Install the motor in the reverse order of removal. After installation, make sure the air mix control motor runs smoothly.

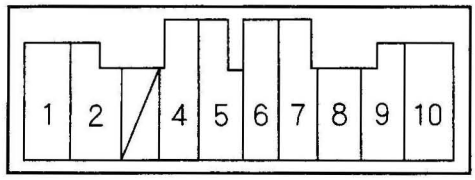
Protected by AR

Mode Control Motor Test

1. Disconnect the 10P connector from the mode control motor.

2. Connect battery power to the No. 1 terminal of the mode control motor, and ground the No. 2 terminal; the mode control motor should run smoothly, and stop at Vent. If it doesn't, reverse the connections; the mode control motor should run smoothly, and stop at Defrost. When the mode control motor stops running, disconnect battery power immediately.

MODE CONTROL MOTOR



3. If the mode control motor does not run in step 2, remove it, then check the mode control linkage and doors for smooth movement.

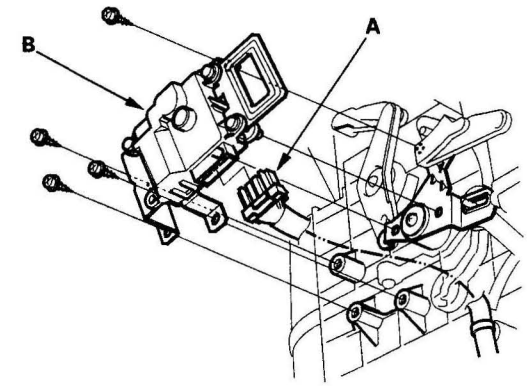
   - If the linkage and doors move smoothly, replace the mode control motor.
   - If the linkage or doors stick or bind, repair them as needed.

4. Use a digital multimeter with an output of 1 mA or less at the 20 kΩ range. With the mode control motor running as in step 2, check for continuity between the No. 4, 5, 6, 7, 8, 9, terminals and the No. 10 terminal individually. There should be continuity for a moment as each terminal.

5. If there is no continuity for a moment at each terminal, replace the mode control motor.

Mode Control Motor Replacement

1. Disconnect the 10P connector (A) from the mode control motor (B). Remove the self-tapping screws and the mode control motor from the heater unit.



2. Install the motor in the reverse order of removal. After installation, make sure the mode control motor runs smoothly.

BACK

Protected by AR

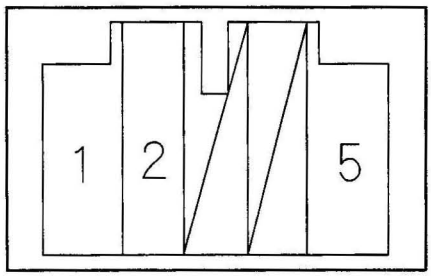
Recirculation Control Motor Test

1. Disconnect the 5P connector from the recirculation control motor.

NOTICE
Incorrectly applying power and ground to the recirculation control motor will damage it. Follow the instructions carefully.

2. Connect battery power to the No. 5 terminal of the recirculation control motor, and ground the No. 1 and No. 2 terminal; the recirculation control motor should run smoothly. To avoid damaging the recirculation control motor, do not reverse power and ground. Disconnect the No. 1 or No. 2 terminals from ground; the recirculation control motor should stop at Fresh or Recirculate. Don't cycle the recirculation control motor for a long time.

RECIRCULATION CONTROL MOTOR



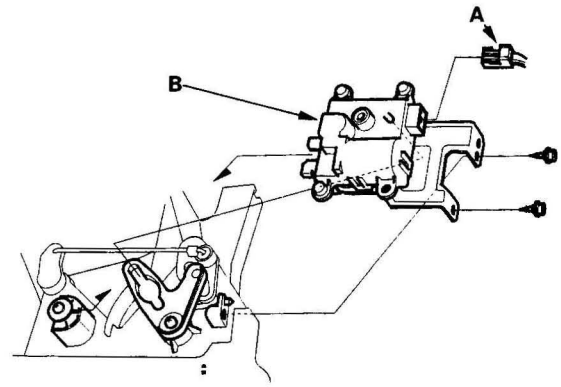
3. If the recirculation control motor does not run in step 2, remove it, then check the recirculation control linkage and doors for smooth movement.

- If the linkage and doors move smoothly, replace the recirculation control motor.
- If the linkage or doors stick or bind, repair them as needed.

Recirculation Control Motor Replacement

1. Remove the evaporator (see page 21-62).

2. Disconnect the 5P connector (A) from the recirculation control motor (B). Remove the self-tapping screws and the recirculation control motor from the blower unit.



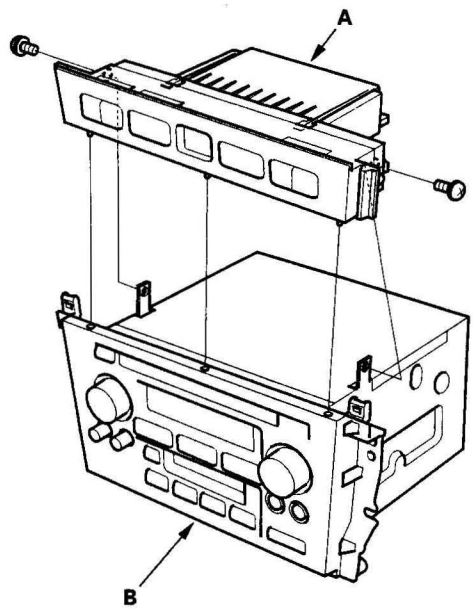
3. Install the motor in the reverse order of removal. After installation, make sure the recirculation control motor runs smoothly.

Protected by AR

Climate Control Unit Removal and Installation

With Navigation System

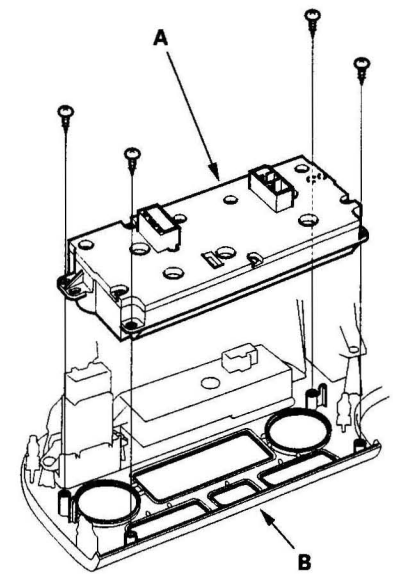
1. Make sure you have the anti-theft code for the radio, and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Remove the climate control unit together with the audio unit (see page 22-202).
3. Remove the screws and climate control unit (A) from the audio unit (B).



4. Install the control unit in the reverse order of removal, and note these items:
   - After installation, operate the climate control unit controls to see whether it works properly.
   - Run the self-diagnosis function to confirm that there are no problems in the system (see page 21-8).
   - Enter the anti-theft code for radio, and the navigation system, then enter the customer's radio station presents.

Without Navigation System

1. Remove the instrument panel together with the climate control unit (see page 20-65).
2. Remove the self-tapping screws and the climate control unit (A) from the instrument panel (B).



3. Install the control unit in the reverse order of removal. After installation, operate the climate control unit to see whether it works properly.
4. Run the self-diagnosis function to confirm that there are no problems in the system. (see page 21-8).

BACK

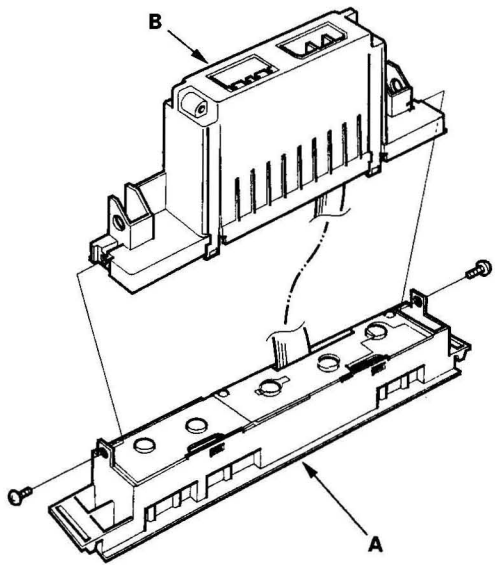
Protected by AR

Climate Control Unit Bulb Replacement

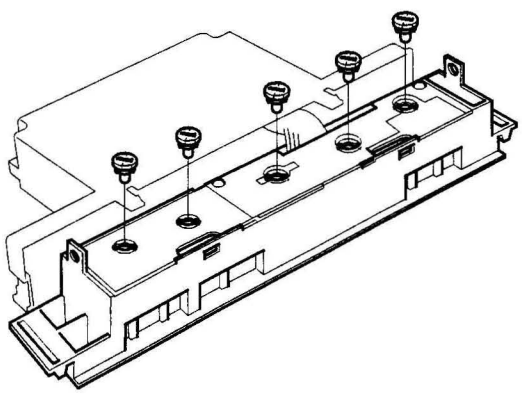
With Navigation System

1. Discharge the static electricity (which accumulated on you when you removed the climate control unit) by touching the door striker or other body parts.

2. Remove the self-tapping screws, then carefully separate the climate control unit display (A) and control unit (B). Do not kink or pull on the wires between the display and the control unit. Do not touch the electronic components on the printed circuit board in the control unit.



3. Remove the bulb(s) with a flat-tip screwdriver.

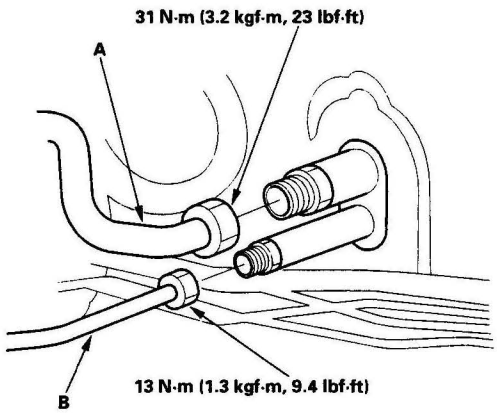


4. Install the bulb in the reverse order of removal.

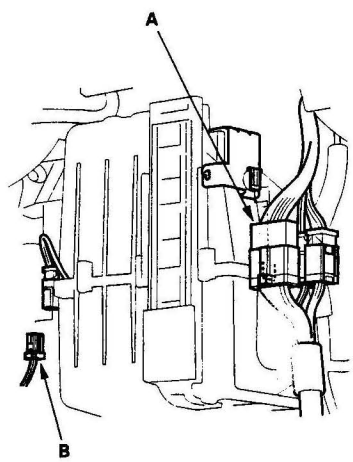
Protected by AR

Evaporator Removal and Installation

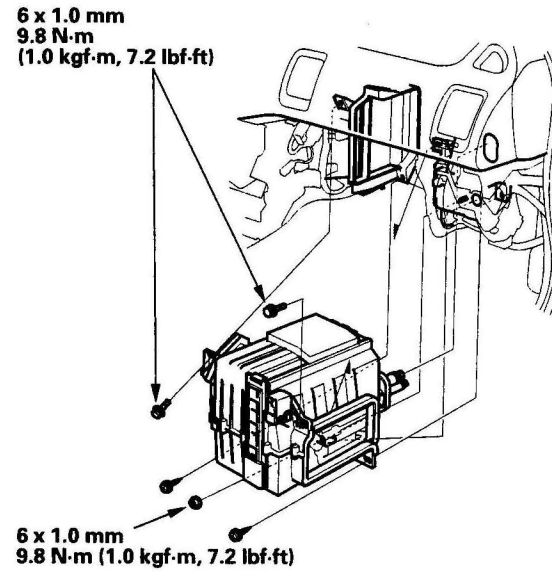
1. Make sure you have the anti-theft code for the radio, and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the under-hood fuse/relay box, but do not disconnect the connectors.
4. Recover the refrigerant with a recovery/recycling/charging station (see page 21-75).
5. Disconnect the suction line (A) and the receiver line (B) from the evaporator. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



6. Remove the glove box and the glove box cover (see page 20-66).
7. Remove the wire harness connectors (A) from the evaporator. Disconnect the connector (B) from the evaporator temperature sensor.



8. Remove the self-tapping screws, the mounting nut, the mounting bolts and the evaporator.



9. Install the evaporator in the reverse order of removal, and note these items.

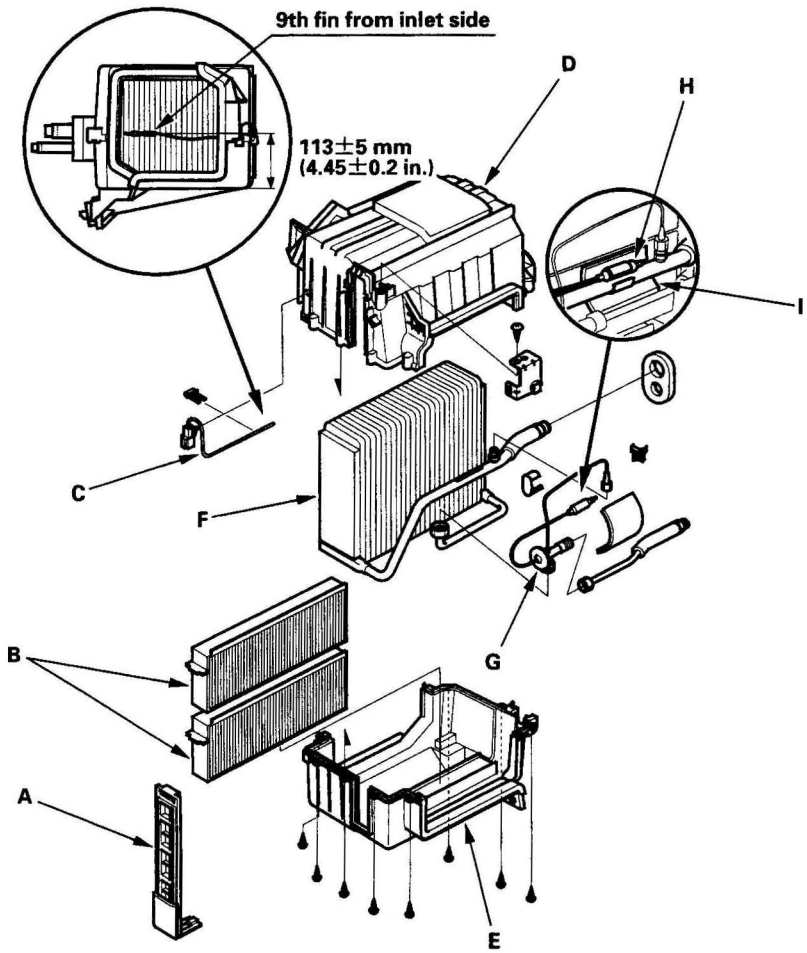
- If you're installing a new evaporator, add refrigerant oil (DENSO ND-OIL 8) (see page 21-6)
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Immediately after using the oil, reinstall the cap on the container, and seal it to aviod moisture absorption.
- Do not spill the refrigent oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Make sure that there is no air leakage.
- Charge the system (see page 21-77).
- Enter the anti-theft code for the radio, and the navigation system, then enter the customer's radio station presets.

BACK

Protected by AR

Evaporator Components Replacement

1. Remove the filter lid (A), then pull out the dust and pollen filters (B).



2. Pull out the evaporator temperature sensor (C) from the evaporator fins.

3. Remove the screws, carefully separate the upper housing (D) from the lower housing (E), then remove the evaporator core (F).

4. If necessary, remove the expansion valve (G). Use a second wrench to hold the other fitting on the valve so the evaporator line won't twist. Leave the first fitting loosely connected so you can use it to hold the valve while you loosen the second fitting.

5. Reassemble the evaporator in the reverse order of disassembly, and note these items:

   - Replace all O-rings, with new ones at each fitting and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
   - Install the capillary tube (H) directly against the outlet line, and wrap it with electrical tape (I).
   - Reinstall the evaporator temperature sensor in its original location.
   - Make sure no air is leaking from the upper housing and the lower housing fitting.

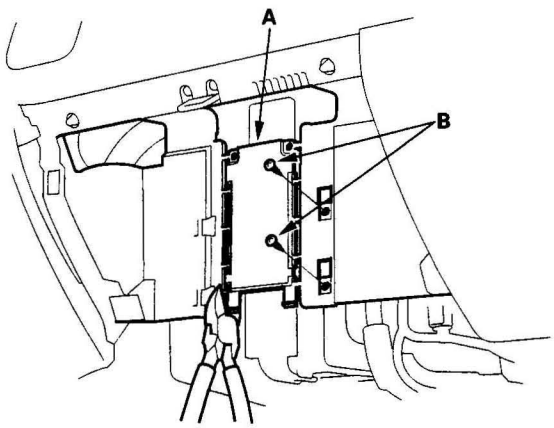
Protected by AR

Dust and Pollen Filter Replacement

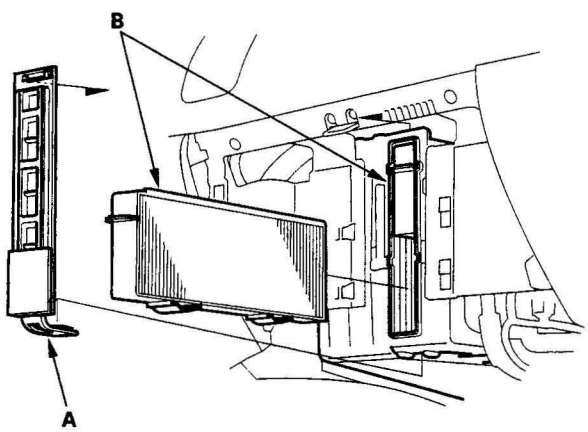
The dust and pollen filter should be replaced every 30,000 miles (48,000 km) or 24 months whichever comes first. Replace the filter more often if the airflow is less than usual.

1. Remove the glove box (see page 20-66).

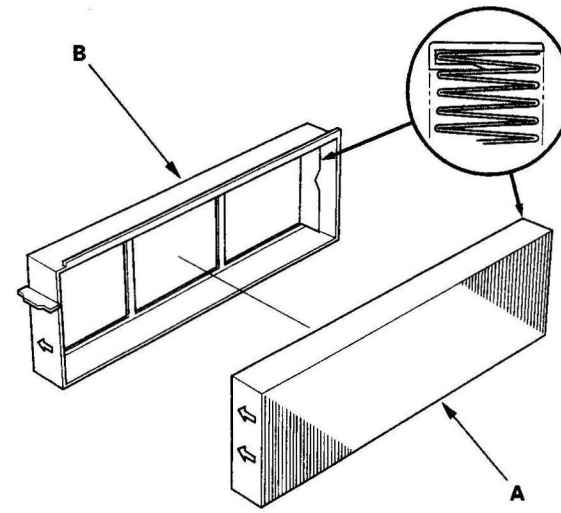
2. Cut the plastic cross brace (A) in the glove box opening with diagonal cutters in the area shown. Remove the cross brace and the two mounting screws (B) from the glove box opening. Retain these parts to be reinstalled later.



3. Remove the filter lid (A) from the evaporator, then pull out the upper and lower dust and pollen filters (B).

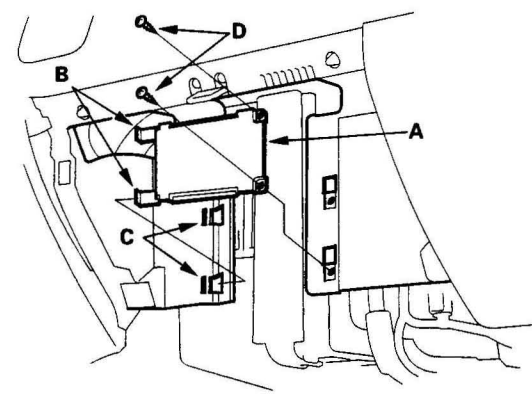


4. Remove and replace the filter (A) from the housing (B).



5. Install the filters in the reverse order of removal. Make sure that there is no air leaking out of the evaporator.

6. Install the cross brace (A) into the glove box opening by aligning the tabs (B) with the slots (C).



7. Secure the cross brace with the two mounting screws (D) removed in step 2.

8. Reinstall the glove box.

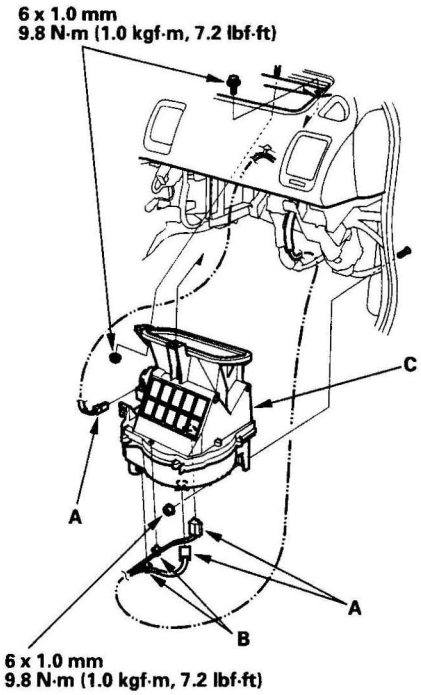
BACK

Protected by AR

Blower Unit Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 23-14), and precautions, and procedures (see page 23-17) in the SRS section before performing repairs or service.

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the front passenger's airbag (see page 23-221).
4. Remove the evaporator (see page 21-62).
5. Disconnect the connectors (A) from the blower motor, the power transistor and the recirculation control motor, then remove the wire harness clips (B). Remove the mounting nuts, the mounting bolt and the blower unit (C).

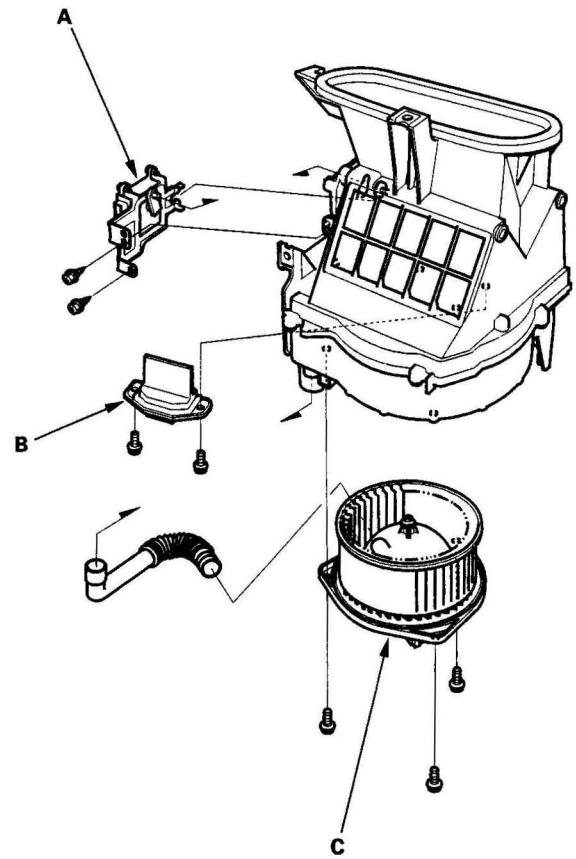


6. Install the unit in the reverse order of removal, and note these items:
   - Make sure that there is no air leakage.
   - Enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

Blower Unit Components Replacement

Note these items when overhauling the blower unit:

- The recirculaion control motor (A), the power transistor (B) and the blower motor (C) can be replaced without removing the blower unit.
- Before reassembly, make sure that the recirculation control linkage and doors move smoothly without binding.
- After reassembly, make sure the recirculation control motor runs smoothly (see page 21-59).

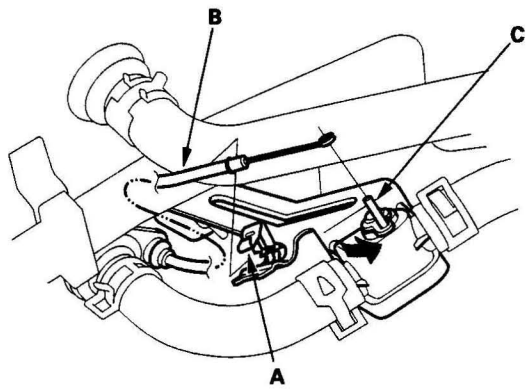


Protected by AR

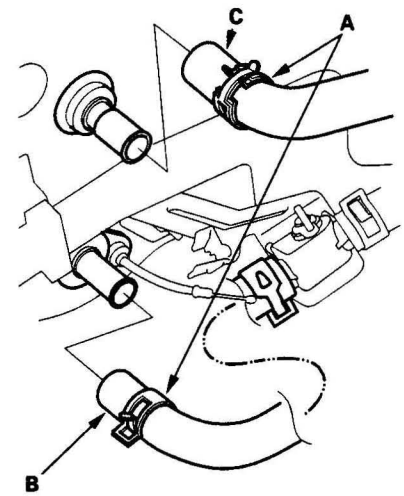
Heater Unit/Core Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-14), and precautions, and procedures (see page 23-17) in the SRS section before performing repairs or servicing.

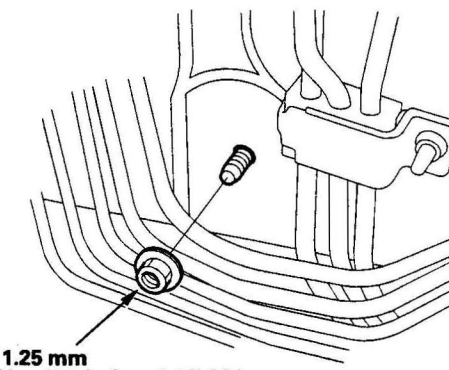
1. Make sure you have the anti-theft code for the radio, and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. From under the hood, open the cable clamp (A), then disconnect the heater valve cable (B) from the heater valve arm (C). Turn the heater valve arm to the fully opened position as shown.



4. When the engine is cool, drain the engine coolant from the radiator (see page 10-13).
5. Slide the hose clamps (A) back, then disconnect the inlet heater hose (B) and outlet heater hose (C) from the heater unit. Engine coolant will run out when the hoses are disconnected; drain it into a clean drip pan. Be sure not to let coolant spill on the electrical parts or the painted surfaces. If any coolant spills, rinse it off immediately.



6. Remove the mounting nut from the heater unit. Take care not to damage or bend the fuel lines, the brake lines, etc.



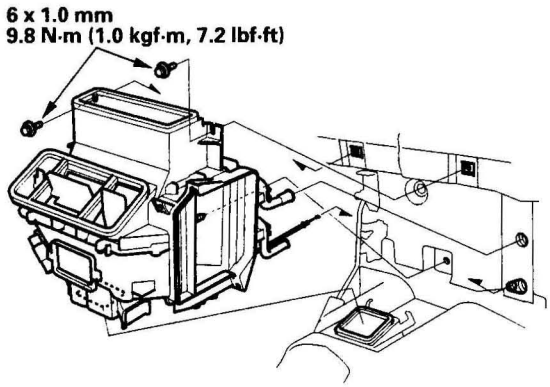
BACK

Protected by AR

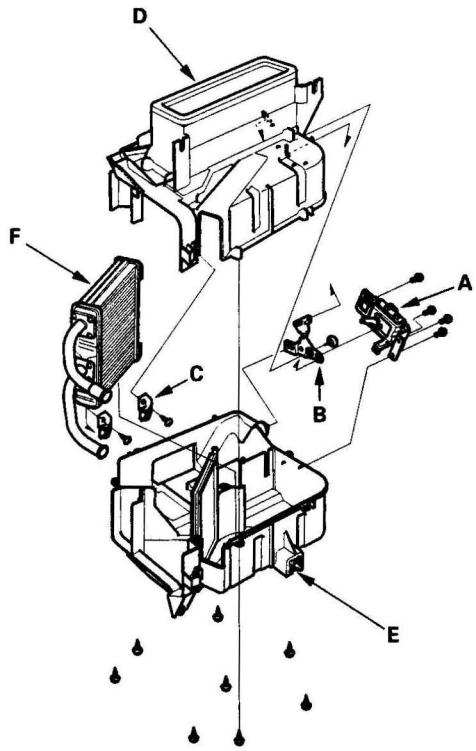
7. Remove the dashboard (see page 20-70).

8. Remove the evaporator (see page 21-62).

9. Remove the mounting bolts and the heater unit.



10. Remove the self-tapping screws, the mode control motor (A) and the linkage (B). Remove the self-tapping screws and the brackets (C). Remove the self-tapping screws, then carefully separate hte upper housing (D) from the lower housing (E). Be careful not to bend the inlet and outlet pipes when removing the heater core (F).



11. Install the heater core in the reverse order of removal.

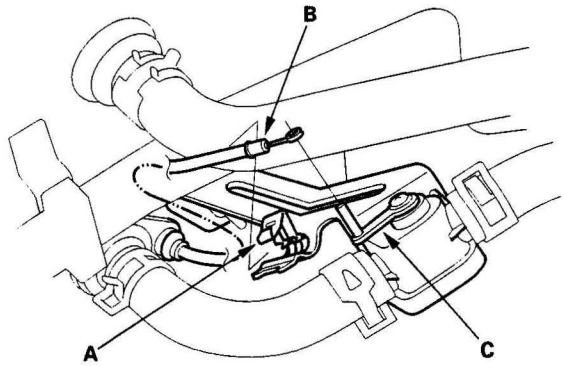
12. Install the heater unit in the reverse order of removal, and note these items:

- Do not interchange the inlet and outlet heater hoses.
- Install the hose clamps securely.
- Refill the cooling system with engine coolant (see page 10-13).
- Adjust the heater valve cable (see page 21-68).
- Make sure that there is no coolant leakage.
- Make sure that there is no air leakage.
- Enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

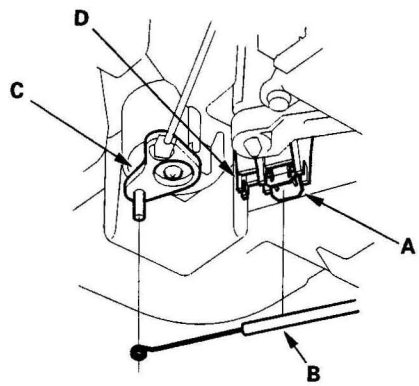
Protected by AR

Heater Valve Cable Adjustment

1. From under the hood, open the cable clamp (A), then disconnect the heater valve cable (B) from the heater valve arm (C).



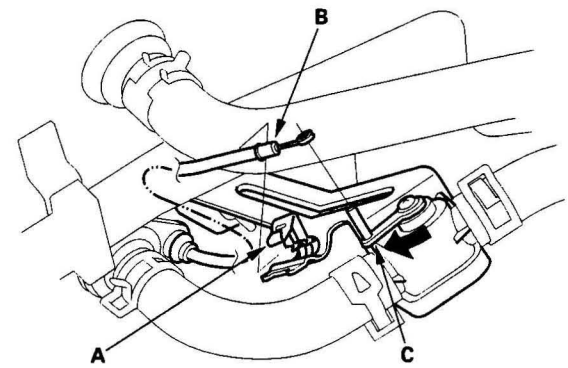
2. From under the dash, disconnect the heater valve cable housing from the cable clamp (A), and disconnect the heater valve cable (B) from the air mix control linkage (C).



3. Set the temperature control button or dial on Max Cool (60°F or 18°C) with the ignition switch ON (II).

4. Attach the heater valve cable (B) to the air mix control linkage (C) as shown above. Hold the end of the heater valve cable housing against the stop (D), then snap the heater valve cable housing into the cable clamp (A).

5. From under the hood, turn the heater valve arm (C) to the fully closed position as shown, and hold it. Attach the heater valve cable (B) to the heater valve arm, and gently pull on the heater valve cable housing to take up any slack, then install the heater valve cable housing into the cable clamp (A).

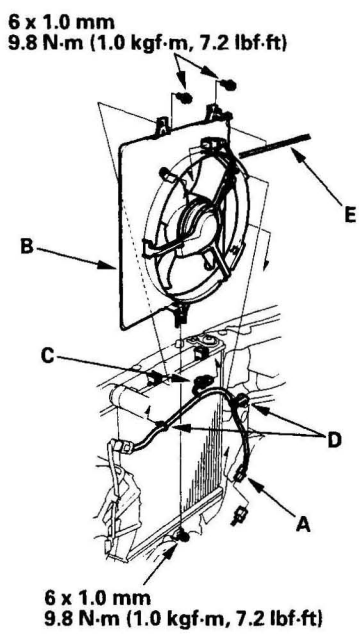


BACK

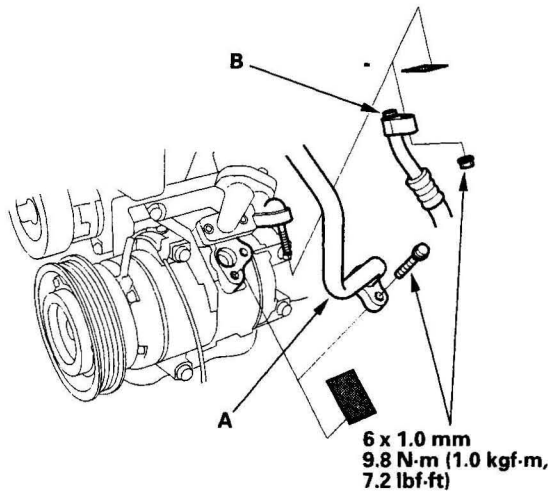
Protected by AR

Compressor Replacement

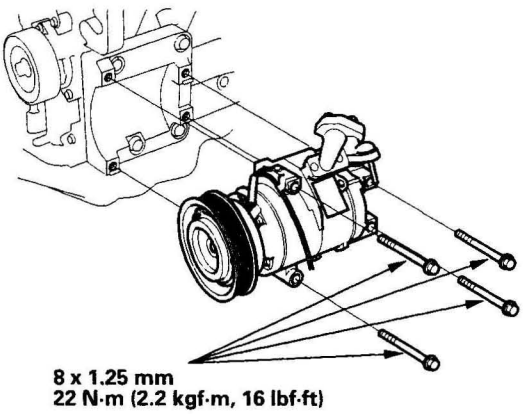
1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Make sure you have the anti-theft code for the radio, and the navigation system, then write down the frequencies for the radio's preset buttons.
3. Disconnect the negative cable from the battery.
4. Recover the refrigerant with a recovery/recycling/charging station (see page 21-75).
5. Remove the alternator (see page 4-23).
6. Remove the compressor clutch connector (A) from the condenser fan shroud (B), then disconnect the compressor clutch connector. Disconnect the condenser fan connector (C), then remove the wire harness clips (D) from the condenser fan shroud. Remove the cruise control actuator cable (E) from the clamp. Loosen the lower mounting bolt, then remove the upper mounting bolts and the condenser fan shroud. Be careful not to damage the radiator fins when removing the condenser fan shroud.



7. Remove the bolt and the nut, then disconnect the suction line (A) and discharge line (B) from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



8. Remove the mounting bolts and the compressor. Be careful not to damage the radiator fins when removing the compressor.

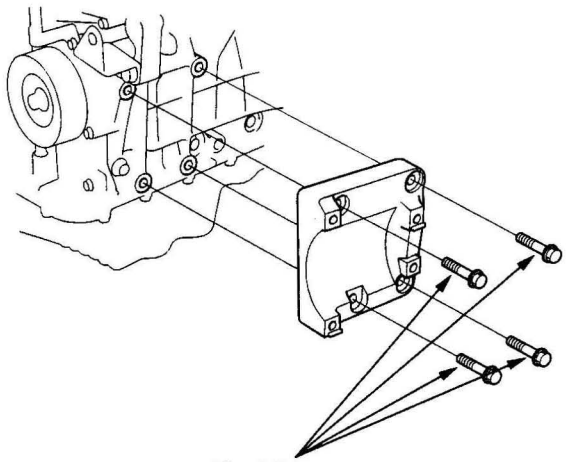


(cont'd)

Protected by AR

Compressor Replacement (cont'd)

9. If necessary, remove the mounting bolts and the compressor bracket.



10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)

10. Install the compressor in the reverse order of removal, and note these items:

- If you're installing a new compressor, you must calculate the amount of refrigerant oil to be removed from it (see page 21-6).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Use refrigerant oil (DENSO ND-OIL 8) for HFC-134a DENSO piston type compressor only.
- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Be careful not to damage the radiator fins when installing the compressor and the condenser fan shroud.
- Evacuate the system (see page 21-76).
- Charge the system (see page 21-77).
- Enter the anti-theft code for the radio, and the navigation system, then enter the customer's radio station presets.

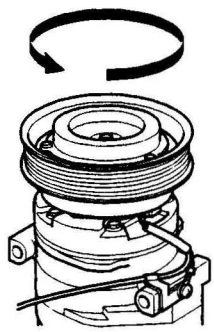
BACK

Protected by AR

Compressor Clutch Check

1. Check the plated parts of the pressure plate for color changes, peeling or other damage. If there is damage, replace the clutch set (see page 21-72).

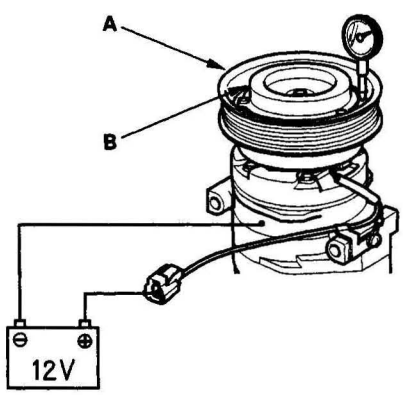
2. Check the pulley bearing play and drag by rotating the pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag (see page 21-72).



3. Measure the clearance between the pulley (A) and the pressure plate (B) with a dial indicator. Zero out the indicator, then apply battery voltage to the compressor clutch. Measure the movement of the pressure plate when the voltage is applied. If the clearance is not within the specified limits, the pressure plate must be reshimed (see page 21-72).

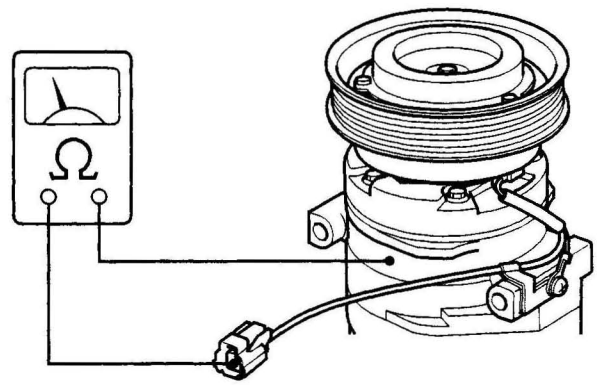
   Clearance: 0.5±0.15 mm (0.020±0.006 in.)

   NOTE: The shims are available in four thicknesses: 0.1 mm, 0.3 mm, 0.5 mm and 1.5 mm.



4. Check resistance of the field coil. If resistance is not within specifications, replace the field coil (see page 21-72).

   Field Coil Resistance: 3.4—3.8 ohms at 68°F (20°C)



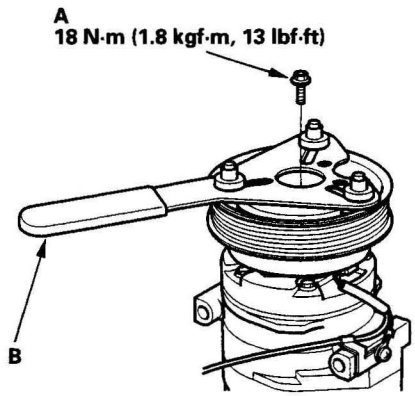
BACK

Protected by AR

Compressor Clutch Overhaul

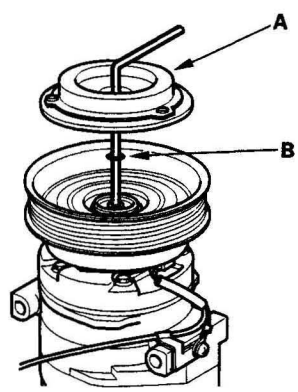
Special Tool Required
A/C clutch holder, Robinair 10204, Kent-Moore J37872 or Honda Tool and Equipment KMT-J33939, commercially available

1. Remove the center bolt (A) while holding the pressure plate with a commercially available A/C clutch holder (B).

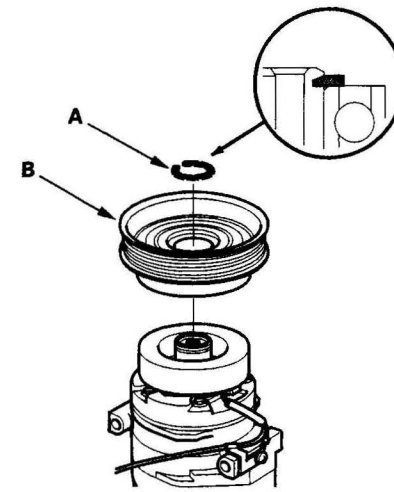


2. Remove the pressure plate (A) and shim(s) (B), taking care not to lose the shim(s). If the clutch needs adjustment, increase or decrease the number and thickness of shims as nesessary, then reinstall the pressure plate, and recheck its clearance (see page 21-71).

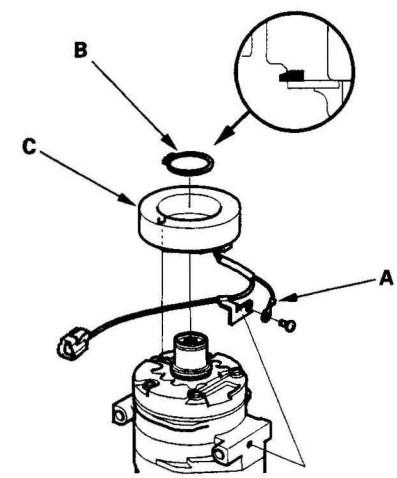
   NOTE: The shims are available in four thickness: 0.1 mm, 0.3 mm, 0.5 mm and 1.5 mm.



3. If you are replacing the field coil, remove the snap ring (A) with snap ring pliers, then remove the pulley (B). Be careful not to damage the pulley or the compressor.



4. Remove the screw from the field coil ground terminal (A). Remove the snap ring (B) with snap ring pliers, then remove the field coil (C). Be careful not to damage the field coil or the compressor.



BACK

Protected by AR

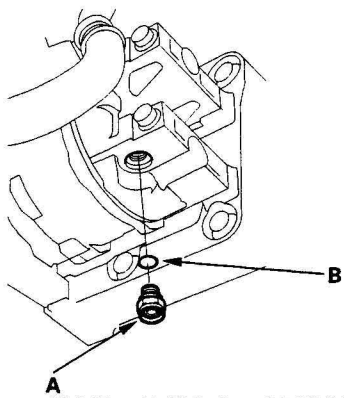
5. Reassemble the clutch in the reverse order of disassembly, and note these items:

   - Install the field coil with the wire side facing down, and align the boss on the field coil with the hole in the compressor.
   - Clean the pulley and compressor sliding surfaces with contact cleaner or other non-petroleum solvent.
   - Install new snap rings, note the installation direction, and make sure they are fully seated in the groove.
   - Make sure that the pulley turns smoothly after it's reassembled.
   - Route and clamp the wires properly or they can be damaged by the pulley.

Compressor Relief Valve Replacement

1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-75).

2. Remove the relief valve (A) and the O-ring (B). Plug the opening to keep foreign matter from entering the system and the compressor oil from running out.



13.2 N·m (1.35 kgf·m, 9.76 lbf·ft)

3. Clean the mating surfaces.

4. Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil before installing it.

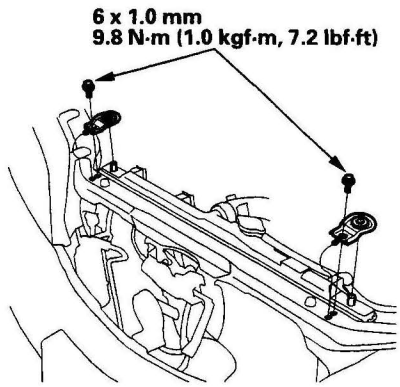
5. Remove the plug, and install and tighten the relief valve.

6. Charge the system (see page 21-77).

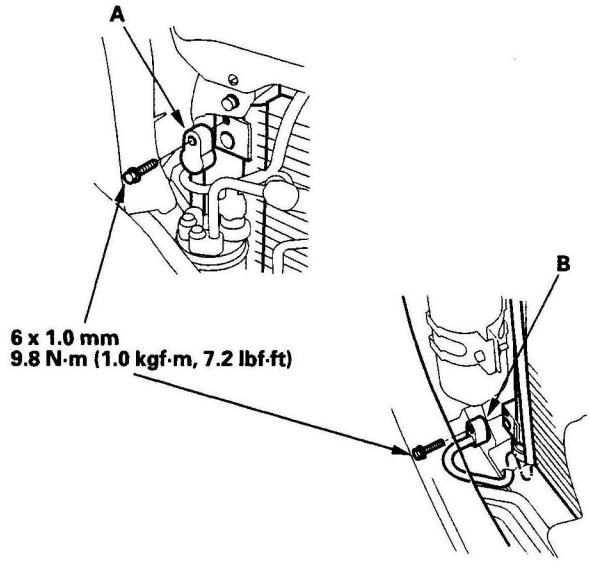
Protected by AR

Condenser Replacement

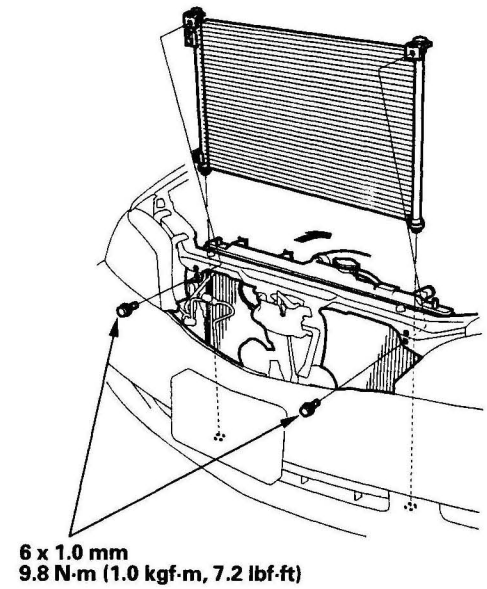
1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-75).
2. Remove the front bulkhead cover (see page 20-135).
3. Remove the bolts and the radiator upper mount brackets.



4. Remove the bolts, then disconnect the discharge line (A) and condenser line (B) from the condenser. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



5. Remove the bolts, then remove the condenser by lifting it up. Be careful not to damage the radiator or the condenser fins when removing the condenser.



6. Install the condenser in the reverse order of removal, and note these items:

- If you're installing a new condenser, add refrigerant oil (DENSO ND-OIL 8) (see page 21-6).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Be careful not to damage the radiator and condenser fins when installing the condenser.
- Charge the system (see page 21-77).

BACK

Protected by AR

Refrigerant Recovery

⚠CAUTION

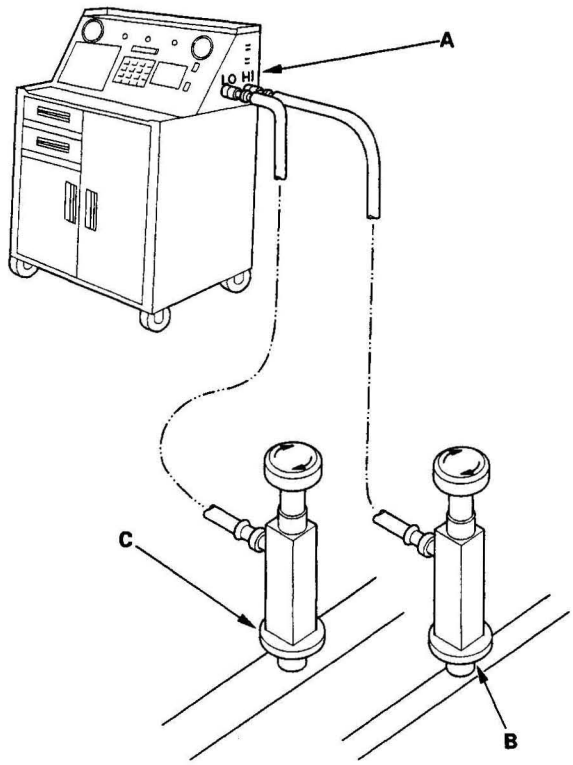
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Measure the amount of refrigerant oil removed from the A/C system after the recovery process is completed. Be sure to put the same amount of new refrigerant oil back into the A/C system before charging.

Protected by AR

System Evacuation

⚠CAUTION

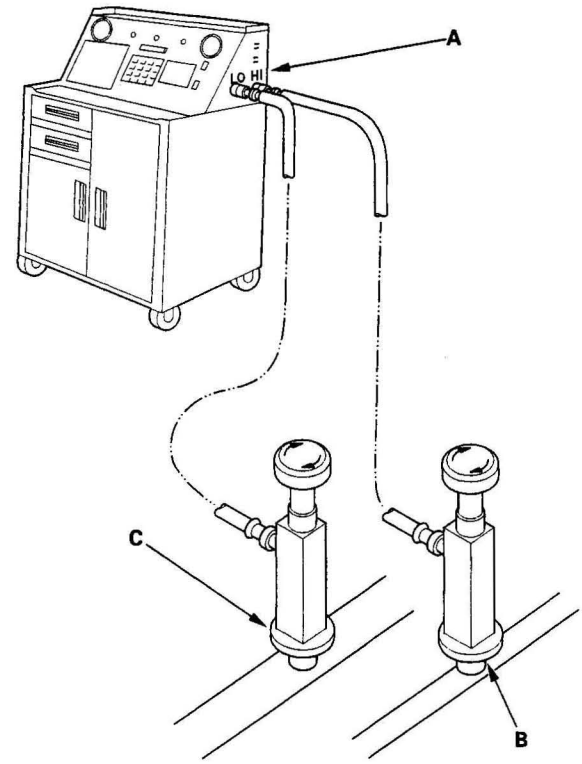
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a R-134a refrigerant recovery/recycling/charging station (If the system has been open for several days, the receiver/dryer should be replaced, and the system should be evacuated for several hours.)
2. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions. Evacuate the system.



3. If the low-pressure does not reach more than 93.3 kPa (700 mm Hg, 27.6 in.Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system, and check for leaks (see step 3 on page 21-78).

BACK

Protected by AR

System Charging

⚠CAUTION

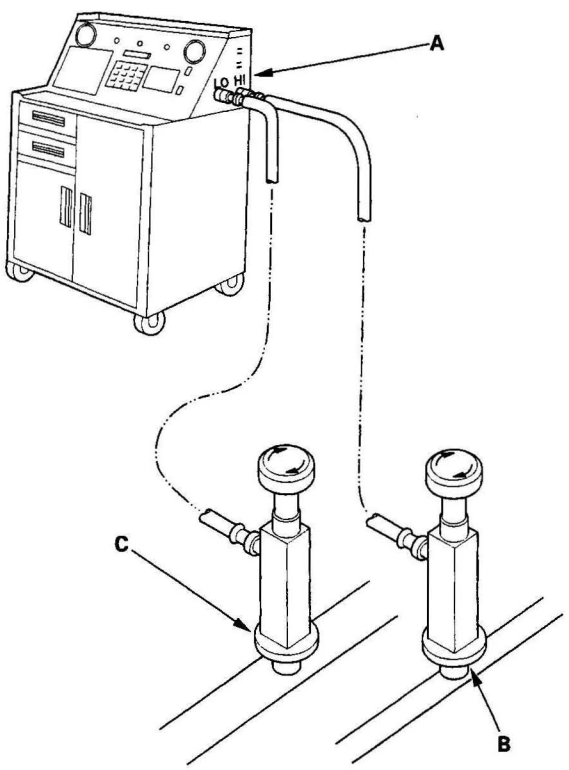
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Evacuate the system (see page 21-76).
3. Add the same amount of new refrigerant oil to the system that was removed during recovery. Use only DENSO ND-OIL 8 refrigerant oil.
4. Charge the system with the specified amount of R-134a refrigerant. Do not overcharge the system; the compressor will be damaged.

   Select the appropriate units of measure for your refrigerant charging station.

   Refrigerant capacity:
   600 to 650 g
   0.60 to 0.65 kg
   1.3 to 1.4 lbs
   21.2 to 22.9 oz

5. Check for refrigerant leaks (see page 21-78).
6. Check for system performance (see page 21-79).

Protected by AR

Refrigerant Leak Test

Special Tool Required
Leak detector, Honda Tool and Equipment YGK-H-10PM, commercially available

⚠ WARNING

- Compressed air mixed with R-134a froms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning system.

⚠ CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

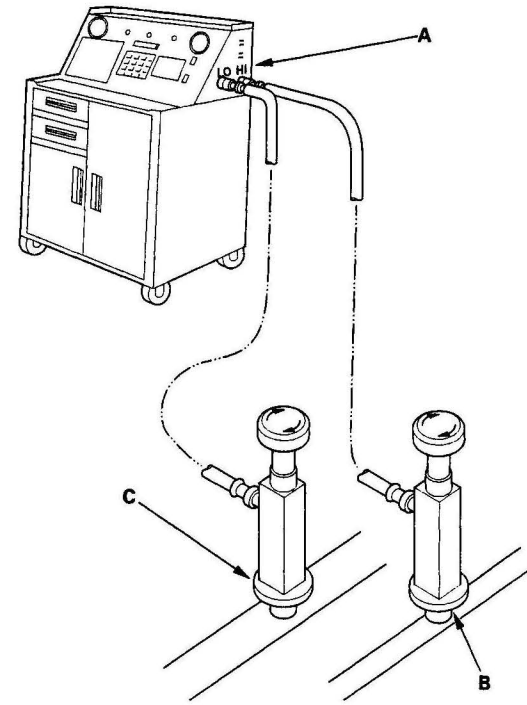
Use only service equipment that is U.L.-listed and is certiified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lulbricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/ charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Open high pressure valve to charge the system to the specified capacity, then close the supply valve, and remove the charging system couplers.

   Select the appropriate units of measure for your refrigerant charging station.

   Refrigerant capacity:
   600 to 650 g
   0.60 to 0.65 kg
   1.3 to 1.4 lbs
   21.2 to 22.9 oz

3. Check the system for leaks using a R-134a refrigerant leak detector with an accuracy of 14 g (0.5 oz) per year or better.

4. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), recover the system.

5. After checking and repairing leaks, the system must be evacuated.

BACK

Protected by AR

A/C System Tests

Pressure Test

Test results	Related symptoms	Probable cause	Remedy
Discharge (high) pressure abnormally high	After stopping compressor, pressure drops to about 196 kPa (2.0 kgf/cm², 28 psi) quickly, and then falls gradually.	Air in system	Recover, evacuate (see page 21-76), and recharge with specified amount (see page 21-77).
	Reduced or no air flow through condenser	• Clogged condenser or radiator fins • Condenser or radiator fan not working properly	• Clean • Check voltage and fan rpm. • Check fan direction.
	Line to condenser is excessively hot.	Restricted flow of refrigerant in system	Restricted lines
Discharge pressure abnormally low	High and low pressures are balanced soon after stopping compressor. Low side is higher than normal.	• Faulty compressor discharge valve • Faulty compressor seal	Replace the compressor.
	Outlet of expansion valve is not frosted, low-pressure gauge indicates vacuum.	• Faulty expansion valve • Moisture in system	• Replace • Recover, evacuate, and recharge with specified amount.
Suction (low) pressure abnormally low	Expansion valve is not frosted, and low-pressure line is not cold. Low-pressure gauge indicates vacuum.	• Frozen expansion valve (Moisture in system) • Faulty expansion valve	• Recover, evacuate, and recharge with specified amount. • Replace the expansion valve.
	Discharge temperature is low, and the air flow from vents is restricted.	Frozen evaporator	Run the fan with compressor off, then check evaporator temperature sensor.
	Expansion valve is frosted.	Clogged expansion valve	Clean or replace.
	Receiver/dryer outlet is cool, and inlet is warm (should be warm during operation).	Clogged receiver/dryer	Replace
Suction pressure abnormally high	Low-pressure hose and check joint are cooler than the temperature around evaporator.	• Expansion valve open too long • Loose expansion capillary tube	Repair or replace.
	Suction pressure is lowered when condenser is cooled by water.	Excessive refrigerant in system	Recover, evacuate, and recharge with specified amount.
	High and low-pressure are equalized as soon as the compressor is stopped, and both gauges fluctuate while running.	• Faulty gasket • Faulty high-pressure valve • Foreign particle stuck in high-pressure valve	Replace the compressor.
Suction and discharge pressures abnormally high	Reduced air flow through condenser.	• Clogged condenser or radiator fins • Condenser or radiator fan not working properly	• Clean • Check voltage and fan rpm. • Check fan direction.
Suction and discharge pressure abnormally low	Low-pressure hose and metal end areas are cooler than evaporator.	Clogged or kinked low-pressure hose parts	Repair or replace.
	Temperature around expansion valve is too low compared with that around receiver/dryer.	Clogged high-pressure line	Repair or replace.
Refrigerant leaks	Compressor clutch is dirty.	Compressor shaft seal leaking	Replace the compressor.
	Compressor bolt(s) are dirty.	Leaking around bolt(s)	Tighten bolt(s) or replace compressor.
	Compressor gasket is wet with oil.	Gasket leaking	Replace the compressor.

(cont'd)

BACK

Protected by AR

A/C System Tests (cont'd)

Performance Test

⚠WARNING

- Compressed air mixed with R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

⚠CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

The performance test will help determine if the air conditioner system is operating within specifications.

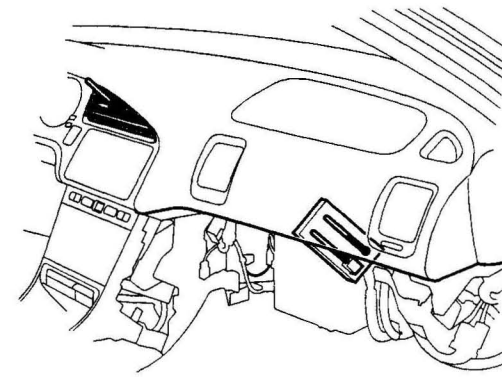
Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station to the high-pressure service port and the low-pressure service port, following the equipment manufacturer's instructions.
2. Determine the relative humidity and air temperature.
3. Insert a thermometer in the center air vent.



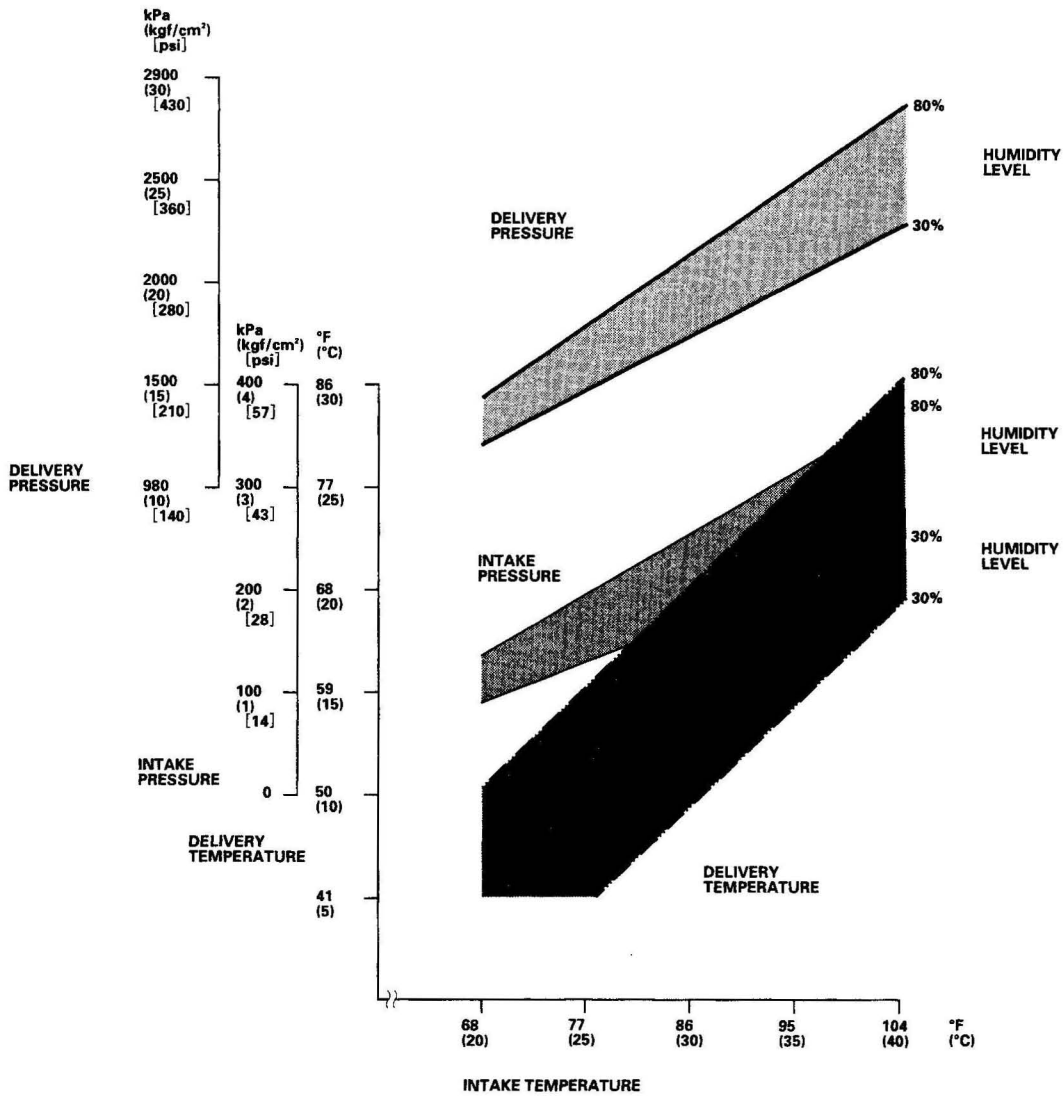
4. Test conditions:
   - Avoid direct sunlight.
   - Open hood.
   - Open front doors.
   - Set the temperature control button or dial on Max Cool (60°F or 18°C), the mode control switch on Vent and the recirculation control switch on Recirculate.
   - Turn the A/C switch on and the fan switch on Max.
   - Run the engine at 1,500 rpm.
   - No driver or passengers in vehicle.
5. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the dash vent, the intake temperature near the blower unit behind the glove box and the high and low system pressure from the A/C gauges.

BACK

Protected by AR

6. To complete the charts:

- Mark the delivery temperature along the vertical line.
- Mark the intake temperature (ambient air temperature) along the bottom line.
- Draw a line straight up from the air temperature to the humidity.
- Mark a point 10 % above and 10 % below the humidity level.
- From each point, draw a horizontal line across the delivery temperature.
- The delivery temperature should fall between the two lines.
- Complete the low-side pressure test and high-side pressure test in the same way.
- Any measurements outside the line may indicate the need for further inspection.



Protected by AR

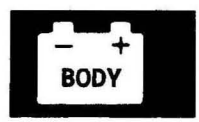
Body Electrical

Body Electrical
Special Tools 22-2
General Troubleshooting Information 22-3
Relay and Control Unit Locations 22-7
Connectors and Harnesses 22-15
Fuse/Relay Boxes 22-92
Power Distribution 22-96
Ground Distribution 22-100
Under-dash Fuse/ Relay Box 22-101
Battery 22-102
Relays 22-103
***Ignition Switch**
Test 22-106
Replacement 22-107
***Gauges**
Component Location Index 22-108
Circuit Diagram 22-110
Gauge Bulb Replacement 22-126
Gauge Assembly Replacement 22-128
Select/Reset Switch Test 22-128
VSS Circuit Troubleshooting 22-129
Maintenance Required Indicator reset Procedure 22-130
Outside Air Temperature Indicator Test 22-131
Safety Indicator System
Component Location Index 22-133
Circuit Diagram 22-134
Safety Indicator Input Test 22-136
Brake Light Failure Sensor Test 22-138
Lights-on, Key-in, Seat Belt Reminder, Key Light Timer, Engine Oil Pressure Indicator Systems
Circuit Diagram 22-139
Control Unit Input Test 22-140
Exterior Lights
Component Location Index 22-142
Circuit Diagram 22-146
Back-up Lights Circuit Diagram 22-154
Brake Lights Circuit Diagram 22-155
Auto-off Headlight Function Circuit Diagram 22-156
Fog Lights Circuit Diagram 22-157
Combination Light Switch Test/Replacement 22-158
Control Unit Input Test 22-160
DRL Control Unit Input Test 22-163
HID Lamp System Troubleshooting 22-165
HID Bulb Removal 22-166
Headlight Adjustment 22-168
Headlight Replacement 22-170
Taillight Replacement 22-170
High Mount Brake Light Replacement 22-171
License Plate Light Replacement 22-171
Bulb Replacement 22-172
Fog Light Replacement 22-172
Fog Light Adjustment 22-173
Fog Light Switch Test/Replacement 22-173
Turn Signal/Hazard Flasher System
Component Location Index 22-174
Circuit Diagram 22-175
Turn Signal/Hazard Relay Input Test 22-176
Hazard Warning Switch Test 22-177
Interior Lights
Component Location Index 22-178
Circuit Diagram 22-179
Spotlight Test 22-180
Ceiling Light Test 22-181
Vanity Mirror Lights Replacement 22-182
Courtesy Light Replacement 22-182
Glove Box Light Replacement 22-183
Console Box Light Replacement 22-183
Trunk Light Test 22-184
Trunk Lid Latch Switch Test 22-184
Dash Lights Brightness Controls
Circuit Diagram 22-185
Control Unit Input Test 22-186
Controller Test 22-188
Entry Light Control System
Component Location Index 22-189
Circuit Diagram 22-190
Ignition Key Switch Test 22-191
Ignition Key Light Test 22-191
Control Unit Input Test 22-192
***Stereo Sound System**
Component Location Index 22-197
Circuit Diagram 22-198
Audio Unit Connector Replacement 22-200
Stereo Amplifer and Equalizer Unit Connector Replacement 22-201
Audio Unit Removal/Installation 22-202
Stereo Amplifier Replacement 22-203
Equalizer Unit Replacement 22-203
Speaker Replacement 22-204
Radio Remote Switch Test 22-205
Window Antenna Coil Test 22-205
Window Antenna Test 22-206
Window Antenna Repair 22-206
Homelink Remote Control System
Circuit Diagram Test 22-207
Accessory Power Socket
Circuit Diagram 22-208
Front Socket Test/Replacement 22-209
Rear Socket Test/Replacement 22-210
Trunk Lid Opener
Component Location Index 22-211
Circuit Diagram 22-212
Main Switch Test 22-213
Switch Test 22-213
Automatic Inside Dimming Mirror
Description 22-214
Circuit Diagram 22-214
Test/Replacement 22-215
Moonroof
Component Location Index 22-216
Circuit Diagram 22-217
Switch Test 22-218
Motor Test 22-218
Limit Switch Test 22-219
Rear Window Defogger
Component Location Index 22-220
Circuit Diagram 22-221
Function Test 22-222
Defogger Wire Repair 22-222
Clock
Circuit Diagram 22-223
Replacement 22-223
Horns
Component Location Index 22-224
Circuit Diagram 22-225
Horn Test/Replacement 22-226
Switch Test 22-227
Power Seats
Component Location Index 22-228
Circuit Diagram
8-way Adjustable 22-229
4-way Adjustable 22-230
Switch Test/Replacement
8-way Adjustable 22-231
4-way Adjustable 22-232
Motor Test
8-way Adjustable 22-233
4-way Adjustable 22-234

Protected by AR

Power Mirrors
Component Location Index 22-235
Circuit Diagram 22-236
Function Test 22-237
Power Mirror and Mirror Defogger Switch Test 22-238
Power Mirror Actuator Test 22-239
Power Mirror Actuator Replacement 22-240
Driving Position Memory System (DPMS)
Component Location Index 22-242
Descriptions 22-244
Self-diagnostic Procedure 22-245
Diagnostic Trouble Code (DTC) Chart 22-247
Circuit Diagram 22-248
Control Unit Input Test 22-254
Power Seat Control Unit Input Test 22-260
Driving Position Memory Switch Test/Replacement 22-265
Power Seat Position Sensor Troubleshooting 22-266
Power Mirror Position Sensor Troubleshooting 22-270
Driver's Power Seat Motor Test 22-274
Seat Heaters
Component Location Index 22-275
Circuit Diagram 22-276
Switch Test 22-277
Heater Test 22-277
Wiper/Washer
Component Location Index 22-278
Circuit Diagram 22-279
Control Unit Input Test 22-281
Wiper/Washer Switch Test/Replacement 22-284
Wiper Motor Test 22-285
Washer Motor Test 22-285
Wiper Motor Replacement 22-286
Washer Reservoir Replacement 22-287
Washer Level Switch Test (Canada) 22-287
Washer Tube Replacement 22-288
Immobilizer System
Component Location Index 22-289
Circuit Diagram 22-290
System Description 22-291
Troubleshooting 22-293
Immobilizer Reciever Unit Replacement 22-294
Multiplex Control System
Component Location Index 22-295
Circuit Diagram 22-296
System Description 22-297
Multiplex Control System Troubleshooting 22-298
Multiplex Control Unit Input Test 22-302
Seat Belt Tension Reducer
Circuit Diagram 22-305
Test 22-306
Power Windows
Component Location Index 22-307
Descriptions 22-308
Circuit Diagram 22-309
Control Unit Input Test 22-321
Master Switch Replacement 22-330
Passenger's Window Switch Test/Replacement 22-331
Driver's Window Motor Test 22-332
Passenger's Window Motor Test 22-333
Keyless Entry/Security Alarm System
Component Location Index 22-334
System Description 22-336
Circuit Diagram 22-337
Control Unit Input Test 22-345
Door Lock Actuator Test 22-361
Door Lock Knob Switch Test 22-362
Door Key Cylinder Switch Test 22-363
Door Lock Switch Test 22-363
Trunk Lid Opener Solenoid/ Latch Switch Test 22-364
Security Horn Test 22-364
Security Indicator Test 22-365
Hood Switch Test 22-365
Transmitter Test 22-366
Transmitter Programming 22-366
Keyless Buzzer Test 22-367
Keyless Buzzer Replacement 22-367
Keyless Receiver Unit Input Test 22-368
OnStar System
Component Location Index 22-370
Description 22-371
Circuit Diagram 22-374
Troubleshooting 22-376
OnStar Control Unit Input Test/Replacement 22-377
OnStar System Interface Unit Input Test 22-380
OnStar System Radio Frequency Modulator Unit Input Test/Replacement 22-382
OnStar Buttons and Microphone Input Test 22-384
Cellular Phone Antenna Replacement 22-385

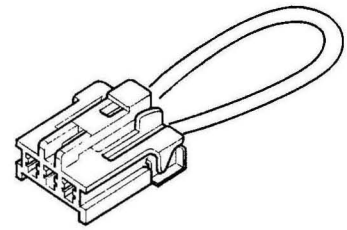
Navigation System 22-387



Protected by AR

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07WAZ-001010A	MPCS Service Connector	1



①

BACK

Protected by AR

General Troubleshooting Information

Tips and Precautions

Before Troubleshooting

1. Check applicable fuses in the appropriate fuse/relay box.

2. Check the battery for damage, state of charge, and clean and tight connections.

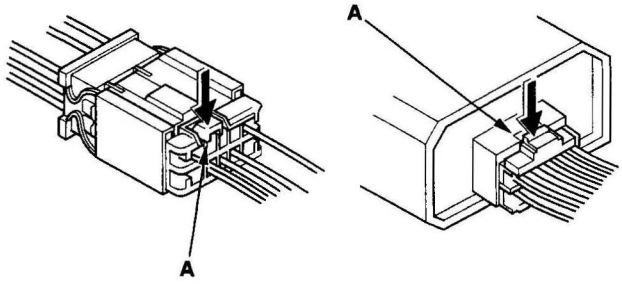
NOTICE

- Do not quick-charge a battery unless the battery ground cable has been disconnected, otherwise you will damage the alternator diodes.
- Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.

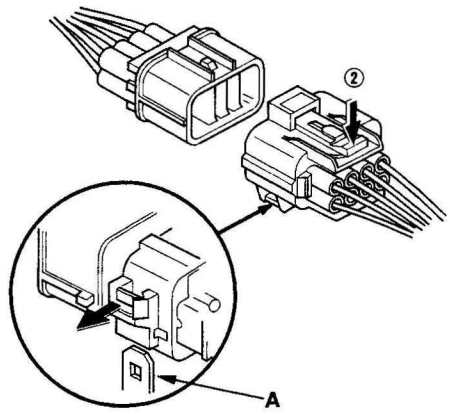
3. Check the alternator belt tension.

Handling Connectors

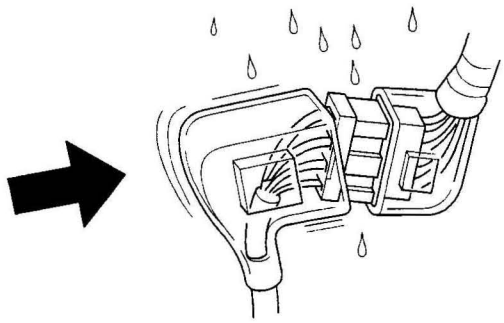
- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with grease (except watertight connectors).
- All connectors have push-down release type locks (A).



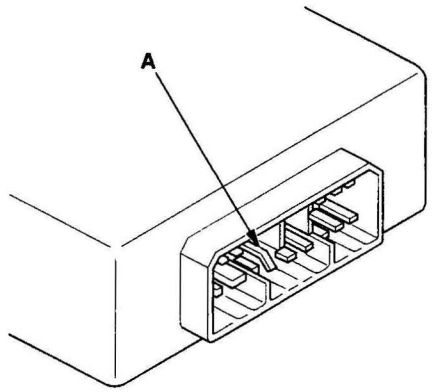
- Some connectors have a clip on their side used to attach them to a mount bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its mount bracket (A).



- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.



- Before connecting connectors, make sure the terminals (A) are in place and not bent.

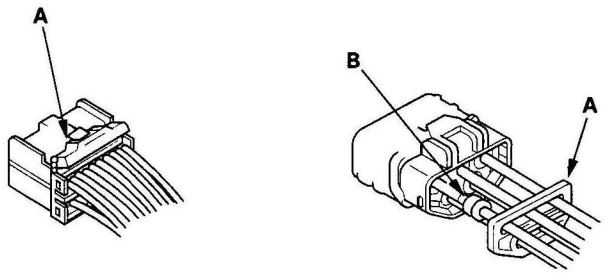


(cont'd)

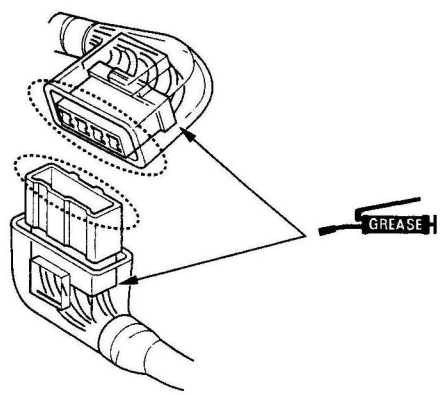
Protected by AR

General Troubleshooting Information (cont'd)

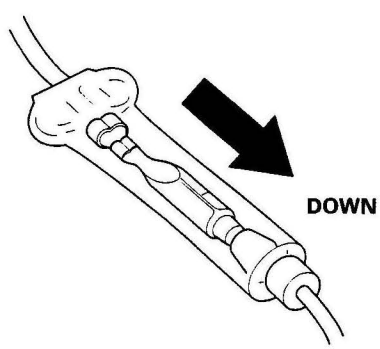
- Check for loose retainer (A) and rubber seals (B).



- The backs of some connectors are packed with grease. Add grease if necessary. If the grease is contaminated, replace it.

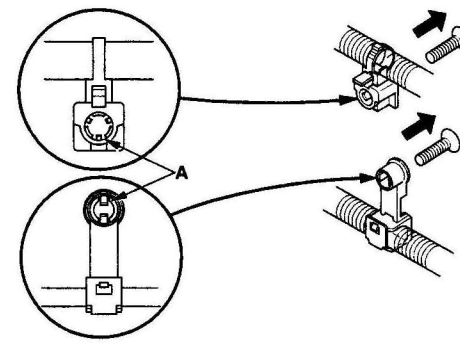


- Insert the connector all the way and make sure it is securely locked.
- Position wires so that the open end of the cover faces down.

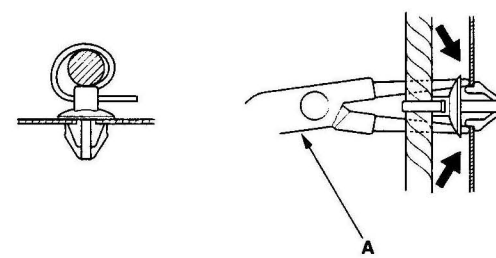


Handling Wires and Harnesses

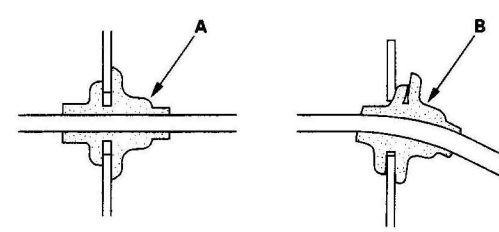
- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; don't damage their locks (A).



- Slip pliers (A) under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.



- After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.
- Seat grommets in their grooves properly (A). Do not leave grommets distorted (B).

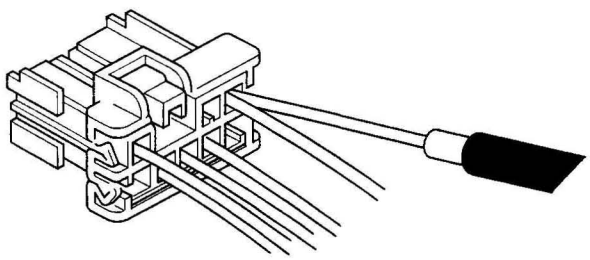


BACK

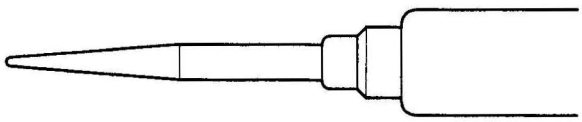
Protected by AR

Testing and Repairs

- Do not use wires or harnesses with broken insulation. Replace them or repair them by wrapping the break with electrical tape.
- After installing parts, make sure that no wires are pinched under them.
- When using electrical test equipment, follow the manufacturer's instructions and those described in this manual.
- If possible, insert the probe of the tester from the wire side (except waterproof connector).



- Use a probe with a tapered tip.



- Refer to the instructions in the Honda Terminal Kit for identification and replacement of connector terminals.

(cont'd)

Protected by AR

General Troubleshooting Information (cont'd)

Five-step Troubleshooting

1. Verify The Complaint
   Turn on all the components in the problem circuit to verify the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.

2. Analyze The Schematic
   Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power feed through the circuit components to ground. If several circuits fail at the same time, the fuse or ground is a likely cause.

   Based on the symptoms and your understanding of the circuit operation, identify one or more possible causes of the problem.

3. Isolate The Problem By Testing The Circuit
   Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.

4. Fix The Problem
   Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

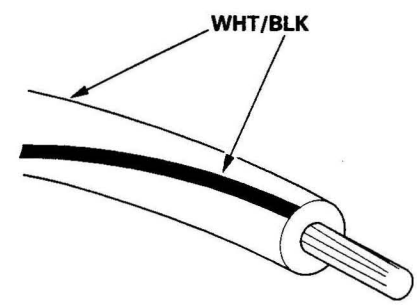
5. Make Sure The Circuit Works
   Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on the fuse. Make sure no new problems turn up and the original problem does not recur.

Wire Color Codes

The following abbreviations are used to identify wire colors in the circuit schematics:

WHT	White
YEL	Yellow
BLK	Black
BLU	Blue
GRN	Green
RED	Red
ORN	Orange
PNK	Pink
BRN	Brown
GRY	Gray
PUR	Purple
LT BLU	Light Blue
LT GRN	Light Green

The wire insulation has one color or one color with another color stripe. The second color is the stripe.



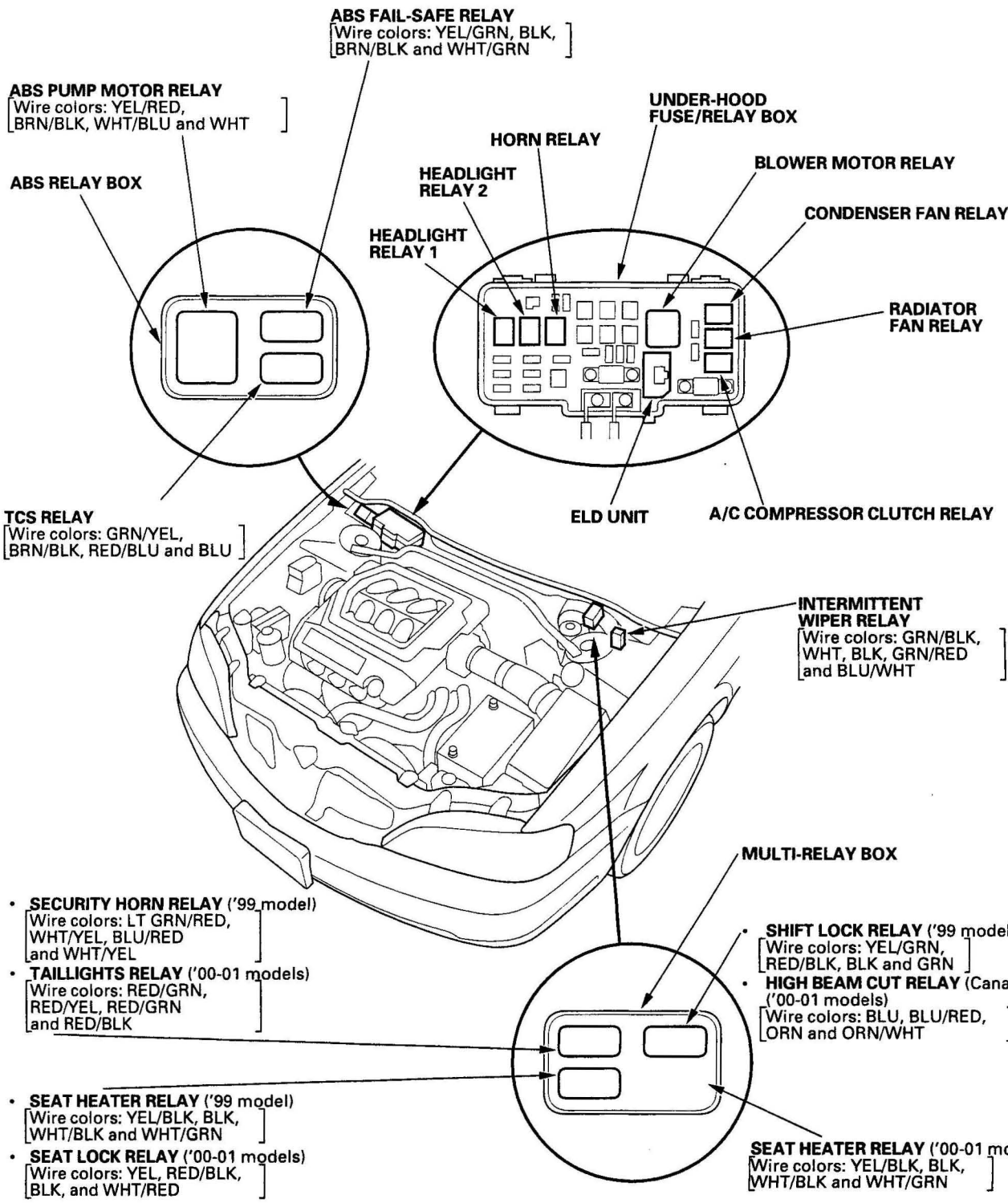
BACK

Protected by AR

Relay and Control Unit Locations

Engine Compartment

'99-01 Models



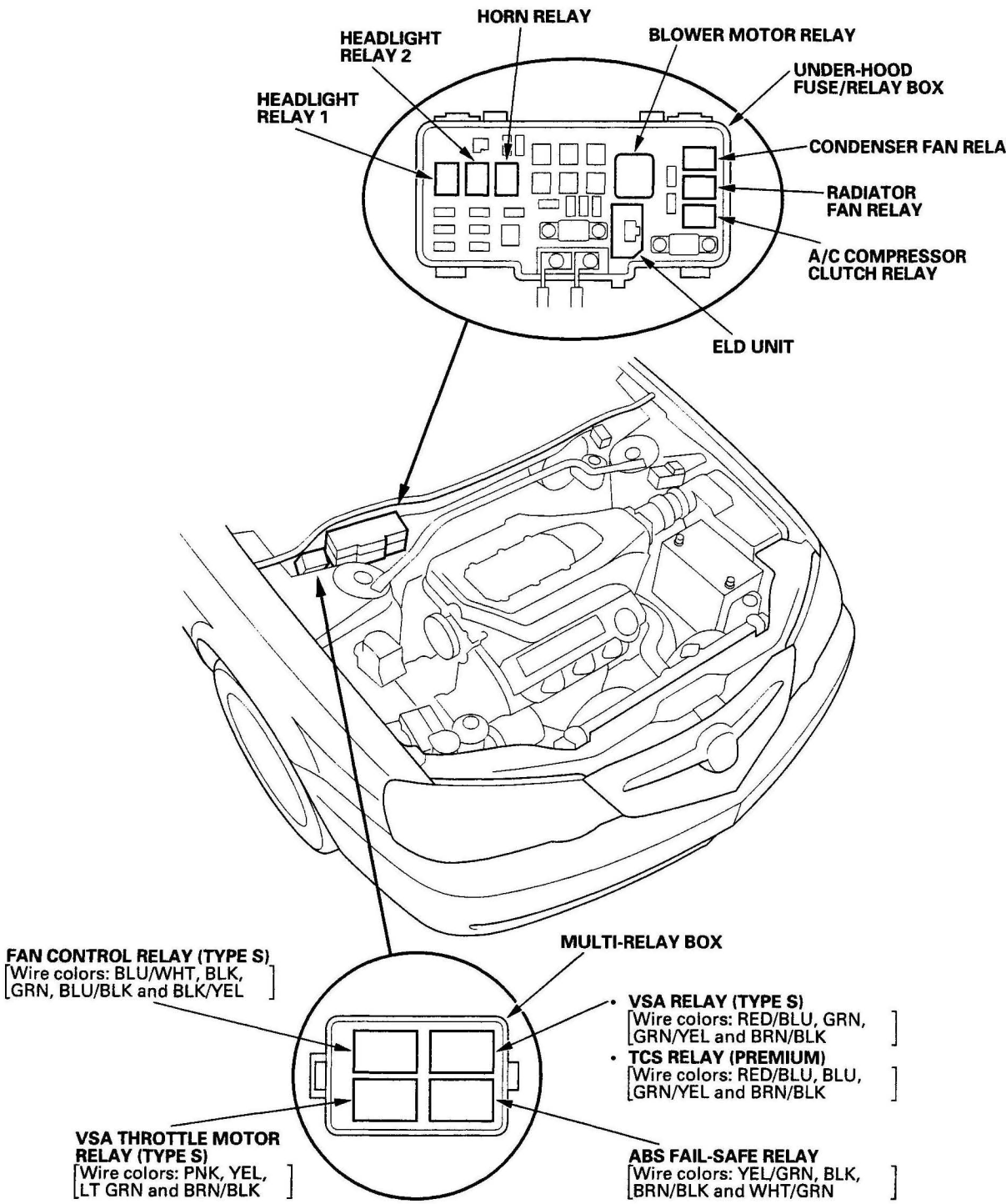
BACK

Protected by AR

Relay and Control Unit Locations

Engine Compartment (cont'd)

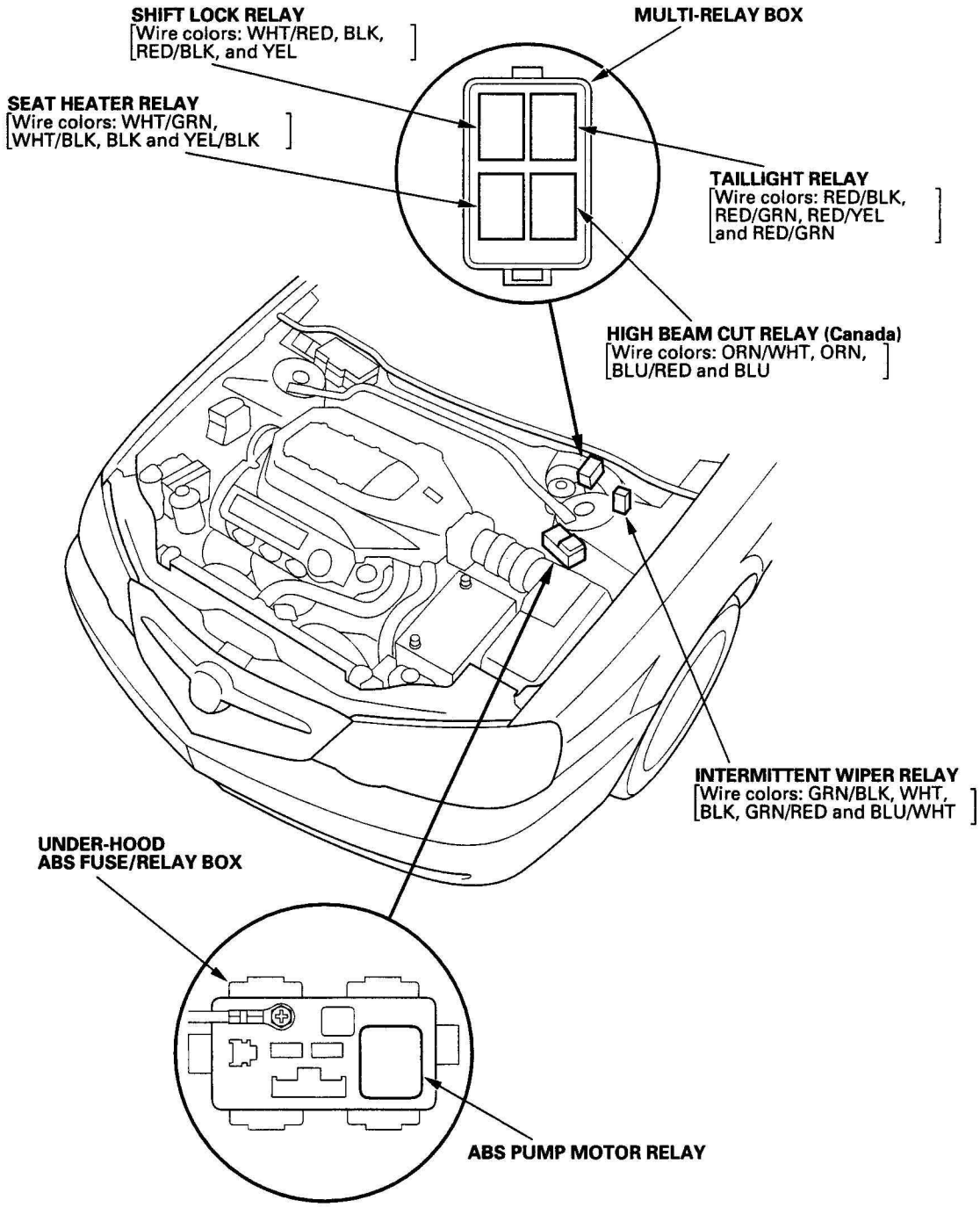
'02-03 Models



BACK

Protected by AR

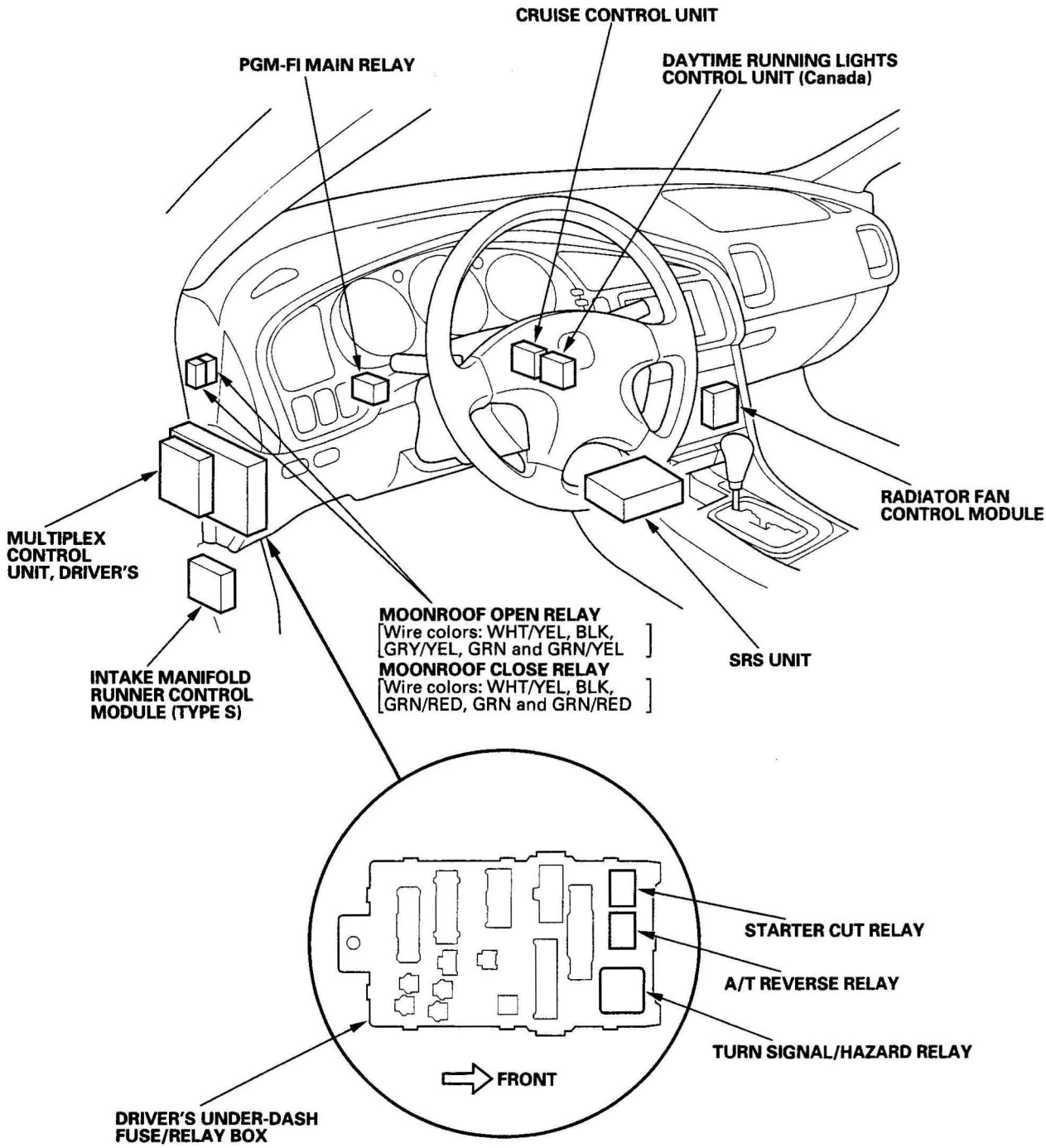
'02-03 Models



Protected by AR

Relay and Control Unit Locations

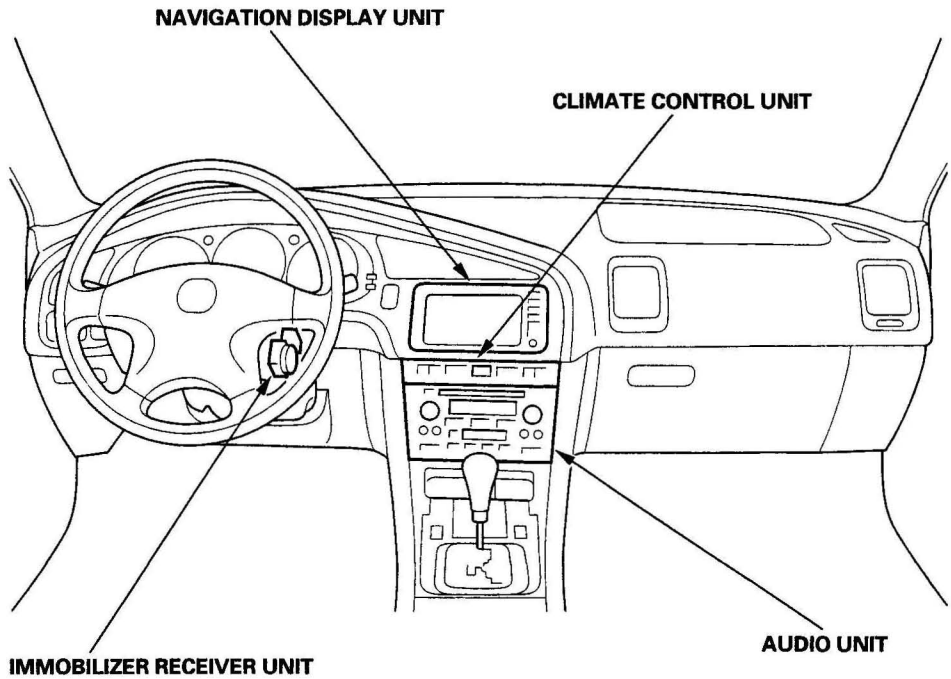
Dashboard



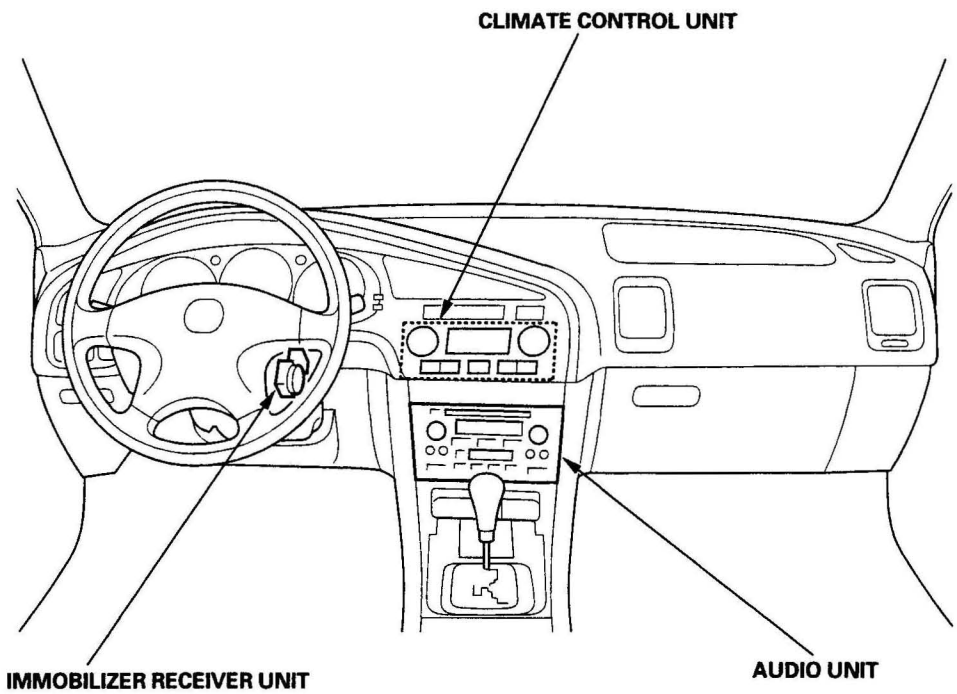
BACK

Protected by AR

With Navigation System:



Without Navigation System:

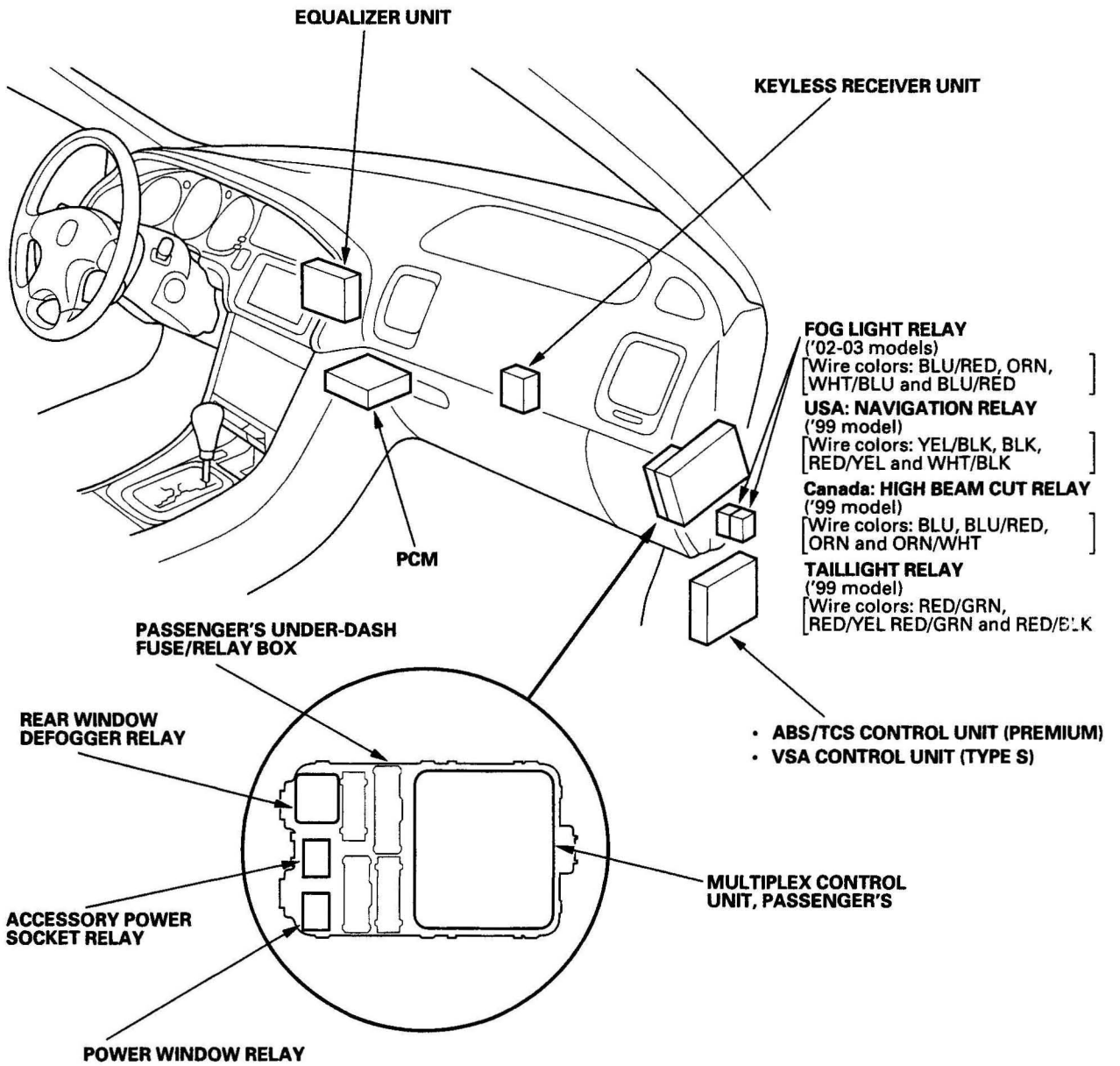


(cont'd)

Protected by AR

Relay and Control Unit Locations

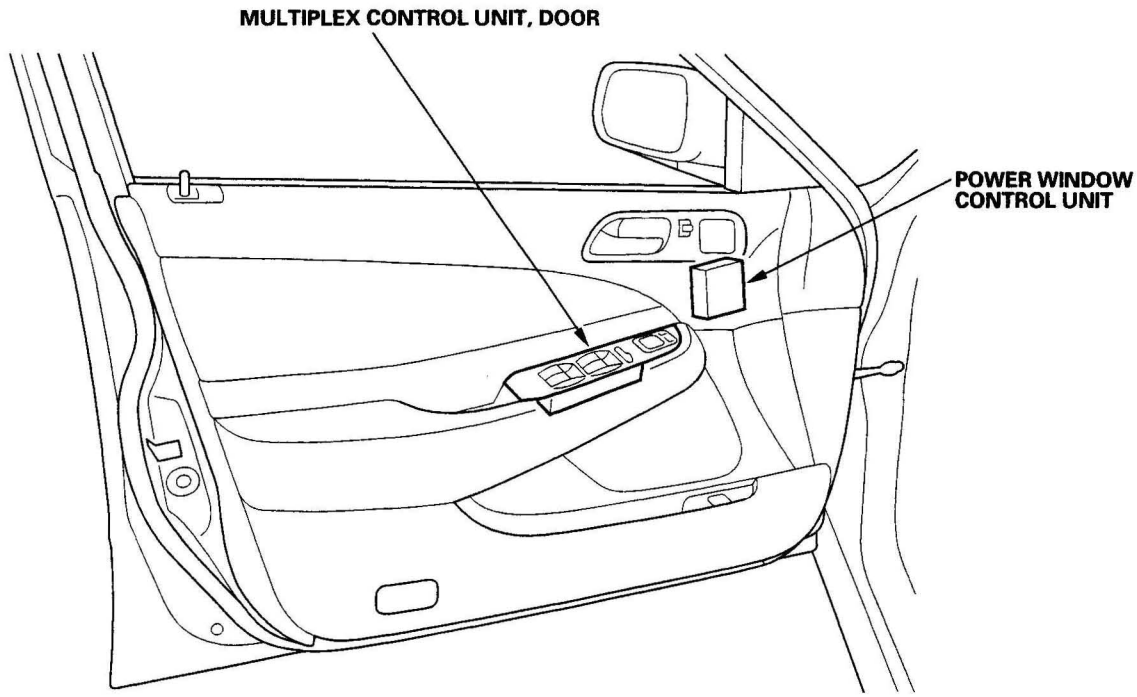
Dashboard (cont'd)

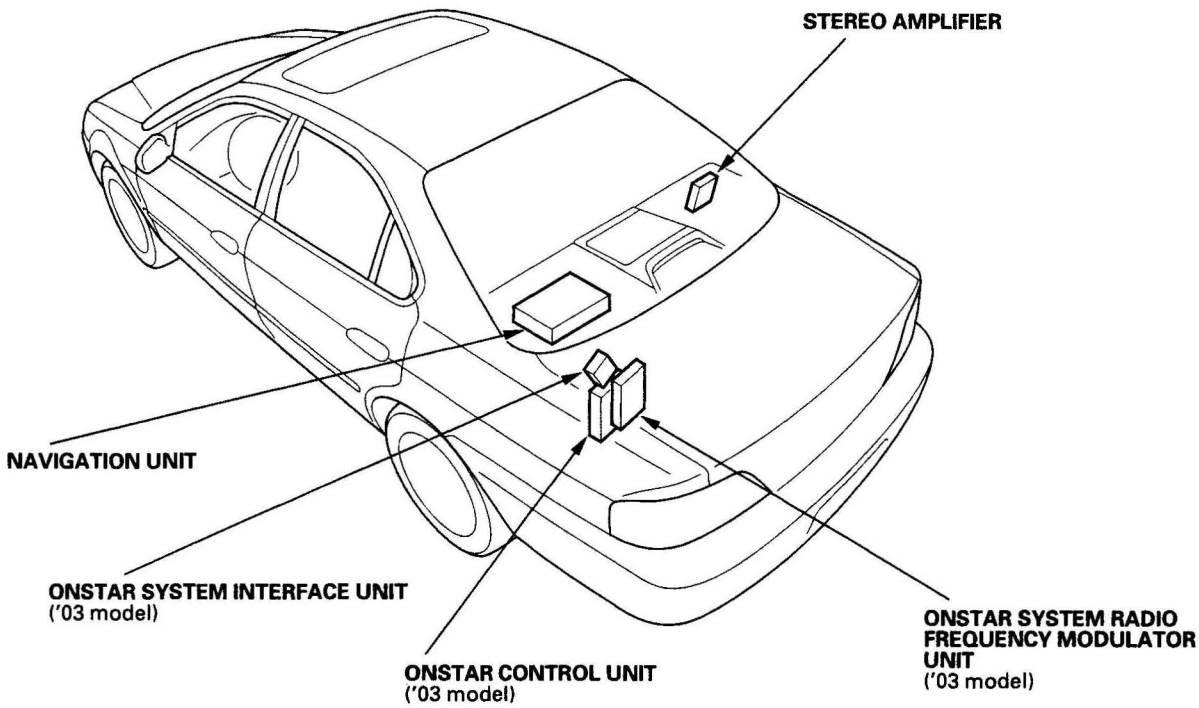


BACK

Protected by AR

Door and Rear Bulkhead

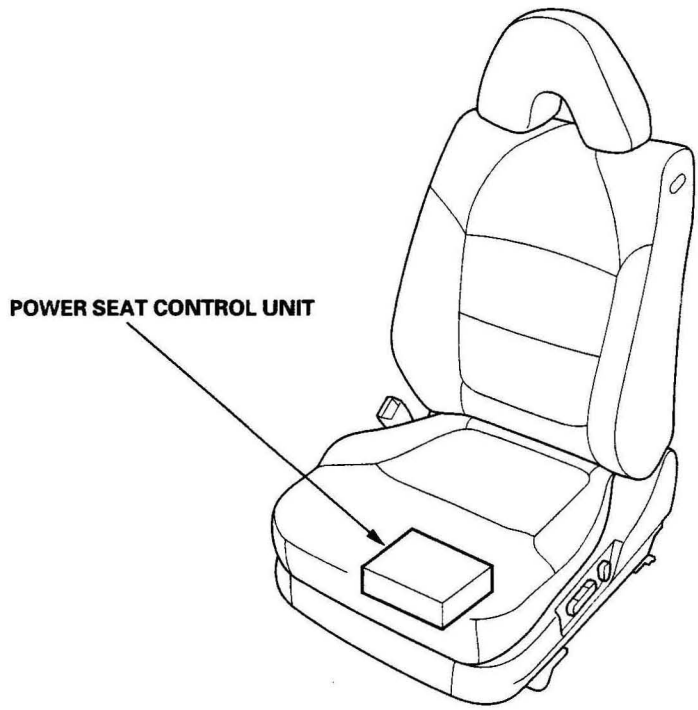




Protected by AR

Relay and Control Unit Locations

Seat



BACK

Protected by AR

Connector Index

'99-01 Models

Identification numbers have been assigned to in-line connectors. The number is preceded by the letter "C" for connectors, "G" for ground terminals or "T" for non-ground terminals.

Harness	Location			
	Engine Compartment	Dashboard	Others (Floor, Door, Trunk and Roof)	Notes
Starter cable	T1, T2 and (+)			(see page 22-17)
Battery ground cable	T3 G1 and (−)			(see page 22-17)
Engine ground cable	T4 G2			(see page 22-17)
Engine wire harness	C101 through C107, C 151 T101 and T102 G101 and G102			(see page 22-18)
Knock sensor sub-harness	C103			(see page 22-18)
Right engine compartment wire harness	G201 through G203	C201 through C204 G402 and G403		(see page 22-30)
Left engine compartment wire harness	C101 and C102 G301 and G302	C301 through C303		(see page 22-38)
Dashboard wire harness B (left branch)		C302 and C401		(see page 22-44)
Dashboard wire harness B (right branch)		C201 through C203, C402 and C403 G401		(see page 22-44)
Dashboard wire harness A		C204, C301, C401, C402, C452, C453, C454, C501, C551, C552, C601, C651 and C801 G501 through G504	C451 and C851	(see page 22-52)
Left side wire harness		C551 and C552	C553 through C555 G551 and G552	(see page 22-62)
Right side wire harness		C501	C581 through C583 G581	(see page 22-66)
Rear window defogger wire harness				(see page 22-66)
Rear wire harness			C555 G601	(see page 22-70)
Roof wire harness			C651	(see page 22-71)
Moonroof wire harness			C601	(see page 22-71)
Shift lock solenoid sub-harness			C451	(see page 22-71)
Driver's door wire harness			C631	(see page 22-72)
Driver's door sub-harness			C631	(see page 22-72)
Front passenger's door wire harness			C701	(see page 22-74)
Front passenger's door sub-harness			C701	(see page 22-74)
Left rear door wire harness			C554	(see page 22-76)
Right rear door wire harness			C582	(see page 22-77)
Driver's seat wire harness			C553	(see page 22-78)
Passenger's seat wire harness			C581	(see page 22-81)
Ignition switch				(see page 22-84)
A/T sub-harness ('00-01 models)	C151 G151			(see page 22-84)
Front accessory power socket sub-harness		C403		(see page 22-86)
Rear accessory power socket sub-harness			C851	(see page 22-86)
SRS main harness			C801 G801	(see page 22-87)
SRS floor harness ('00-01 models)			C583	(see page 22-88)

Protected by AR

Connector Index (cont'd)

'02-03 Models

Identification numbers have been assigned to in-line connectors. The number is preceded by the letter "C" for connectors, "G" for ground terminals or "T" for non-ground terminals.

Harness	Location			
	Engine Compartment	Dashboard	Others (Floor, Door, Trunk and Roof)	Notes
Starter cable	T1, T2, T5 and (+)			(see page 22-17)
Battery ground cable	T3 G1 and (−)			(see page 22-17)
Engine ground cable	T4 G2			(see page 22-17)
Engine wire harness	C101 through C107, C151 T101 and T102 G101 and G102			(see page 22-26)
Knock sensor sub-harness	C103			(see page 22-26)
Right engine compartment wire harness	G201 through G204	C201 through C205 G402 and G403		(see page 22-34)
Left engine compartment wire harness	C101 and C102 G301 and G302	C301 through C304		(see page 22-42)
Dashboard wire harness B (left branch)		C302, C304 and C401		(see page 22-48)
Dashboard wire harness B (right branch)		C201 through C203, C402 and C404 G401		(see page 22-48)
Dashboard wire harness A (left branch)		C301, C401, C452, C453, C454, C551, C552, C556, C557 G501 through G503	C451, C601, C801 C851	(see page 22-56)
Dashboard wire harness A (right branch)		C204, C402 C404, C501, C502, C558 G504	C651	(see page 22-56)
Left side wire harness		C551, C552, C556 and C559	C553 through C555, C560 through C563, G551 and G552	(see page 22-64)
Right side wire harness		C501 and C502	C581 through C583 G581	(see page 22-68)
Rear window defogger wire harness				(see page 22-68)
Rear wire harness			C555 G601	(see page 22-70)
OnStar system sub-harness ('03 model)			C566 and C562	(see page 22-70)
Roof wire harness			C651 and 652	(see page 22-71)
Moonroof wire harness			C563, C601 and C652	(see page 22-71)
Shift lock solenoid sub-harness			C451	(see page 22-71)
Driver's door wire harness		C557	C631 and C632	(see page 22-73)
Driver's door sub-harness			C631	(see page 22-73)
Front passenger's door wire harness		C558	C701	(see page 22-75)
Front passenger's door sub- harness			C701	(see page 22-75)
Left rear door wire harness			C554	(see page 22-76)
Right rear door wire harness			C582	(see page 22-77)
Driver's seat wire harness			C553	(see page 22-80)
Front passenger's seat wire harness			C581	(see page 22-83)
Ignition switch				(see page 22-84)
A/T sub-harness	C151 G151			(see page 22-84)
Front accessory power socket sub-harness		C403		(see page 22-86)
Rear accessory power socket sub-harness			C851	(see page 22-86)
SRS main harness			C801 G801	(see page 22-90)
SRS floor harness			C560 and C583	(see page 22-90)

BACK

Protected by AR

Connector to Harness Index

Starter Cable

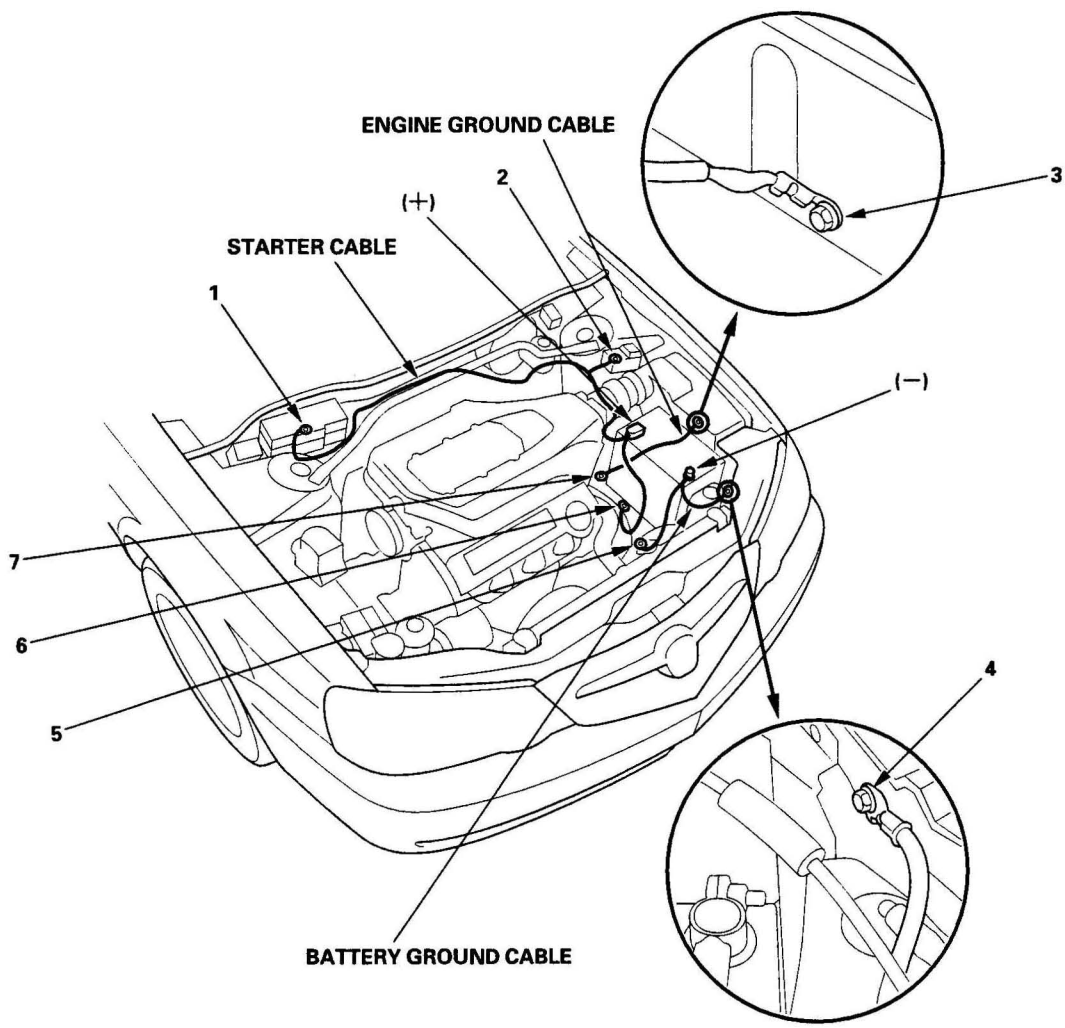
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
T1	1		Right side of engine compartment	Under-hood fuse/relay box	
T2	6		Left side of engine compartment	Starter motor	
T5	2		Left side of engine compartment	Under-hood ABS fuse/relay box	'02-03 models
(+)			Battery	Battery positive terminal	

Battery Ground Cable

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
T3	5		Left side of engine compartment	Transmission housing	
G1	4		Left side of engine compartment	Body ground via battery ground cables	
(−)			Battery	Battery negative terminal	

Engine Ground Cable

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
T4	7		Left side of engine compartment	Transmission housing	
G2	3		Left side of engine compartment	Body ground via engine ground cable	



Protected by AR

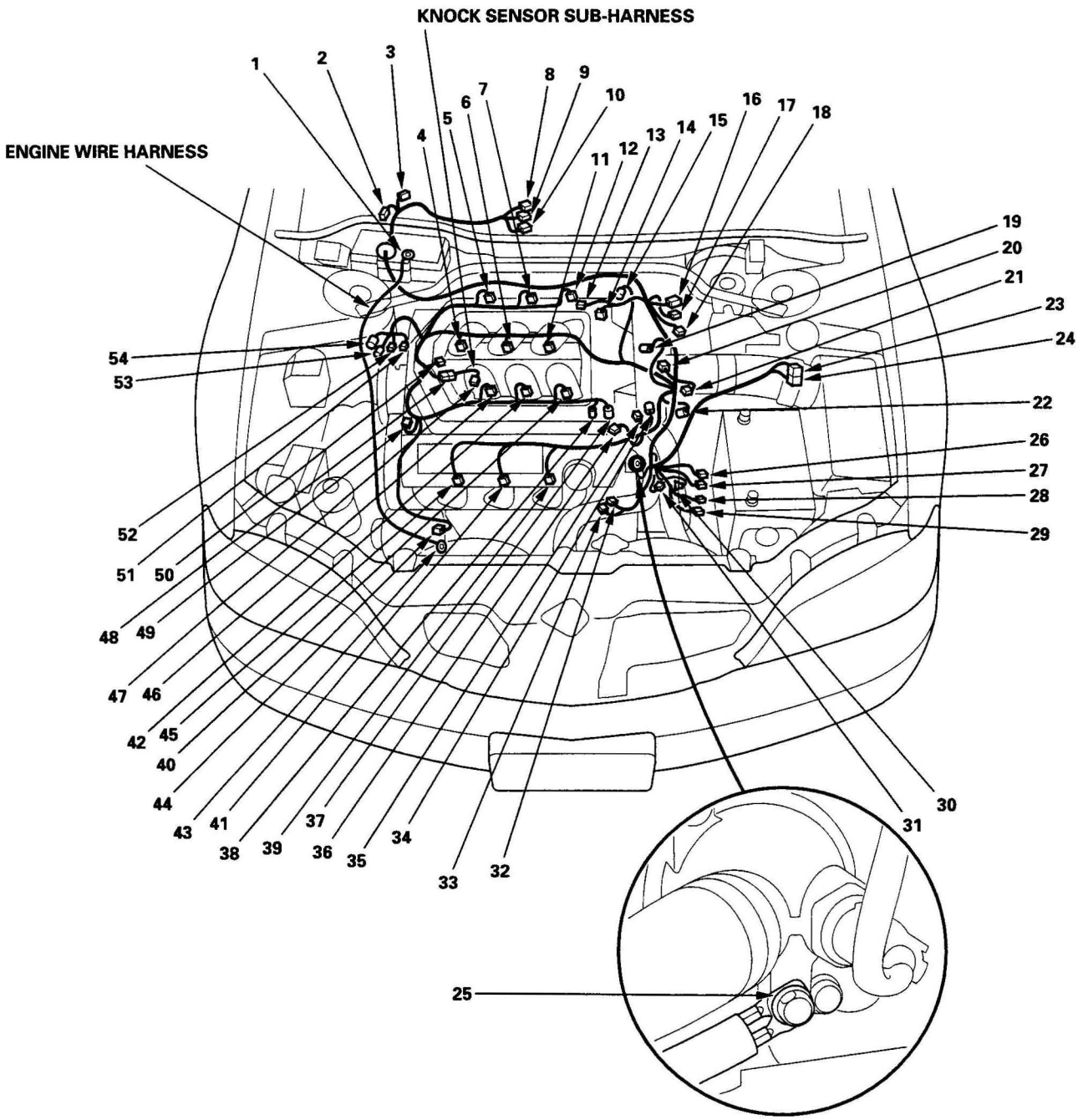
Connector to Harness Index (cont'd)

Engine Wire Harness ('99 model)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Alternator	44	4	Middle of engine compartment		
A/T clutch pressure control valve A	26	2	Left side of engine compartment		
A/T clutch pressure control valve B	27	2	Left side of engine compartment		
Transmission range switch	17	10	Left side of engine compartment		
CKP sensor	51	2	Right side of engine compartment		
Countershaft speed sensor	18	2	Left side of engine compartment		
EGR valve vacuum control solenoid valve	36	6	Left side of engine compartment		
Coolant temperature gauge sending unit	38	1	Left side of engine compartment		
Engine coolant temperature (ECT) sensor	37	2	Left side of engine compartment		
Engine oil pressure switch	53	1	Right side of engine compartment		
Fuel injector No. 1	4	2	Middle of engine compartment		
Fuel injector No. 2	6	2	Middle of engine compartment		
Fuel injector No. 3	11	2	Middle of engine compartment		
Fuel injector No. 4	46	2	Middle of engine compartment		
Fuel injector No. 5	42	2	Middle of engine compartment		
Fuel injector No. 6	40	2	Middle of engine compartment		
Ignition coil No. 1	5	3	Middle of engine compartment		
Ignition coil No. 2	7	3	Middle of engine compartment		
Ignition coil No. 3	12	3	Middle of engine compartment		
Ignition coil No. 4	45	3	Middle of engine compartment		
Ignition coil No. 5	41	3	Middle of engine compartment		
Ignition coil No. 6	39	3	Middle of engine compartment		
Intake air temperature (IAT) sensor	15	2	Left side of engine compartment		
Idle air control (IAC) valve	35	3	Left side of engine compartment		
Torque converter clutch solenoid valve and shift control solenoid valve A	21	3	Left side of engine compartment		
Mainshaft speed sensor	28	2	Left side of engine compartment		
MAP sensor	19	3	Left side of engine compartment		
PCM connector B	8	25	Under middle of dash		
PCM connector C	9	31	Under middle of dash		
PCM connector D	10	16	Under middle of dash		
Primary heated oxygen sensor (Primary HO2S)	13	4	Left side of engine compartment		

BACK

Protected by AR



(cont'd)

Protected by AR

Connector to Harness Index (cont'd)

Engine Wire Harness ('99 Model) (cont'd)

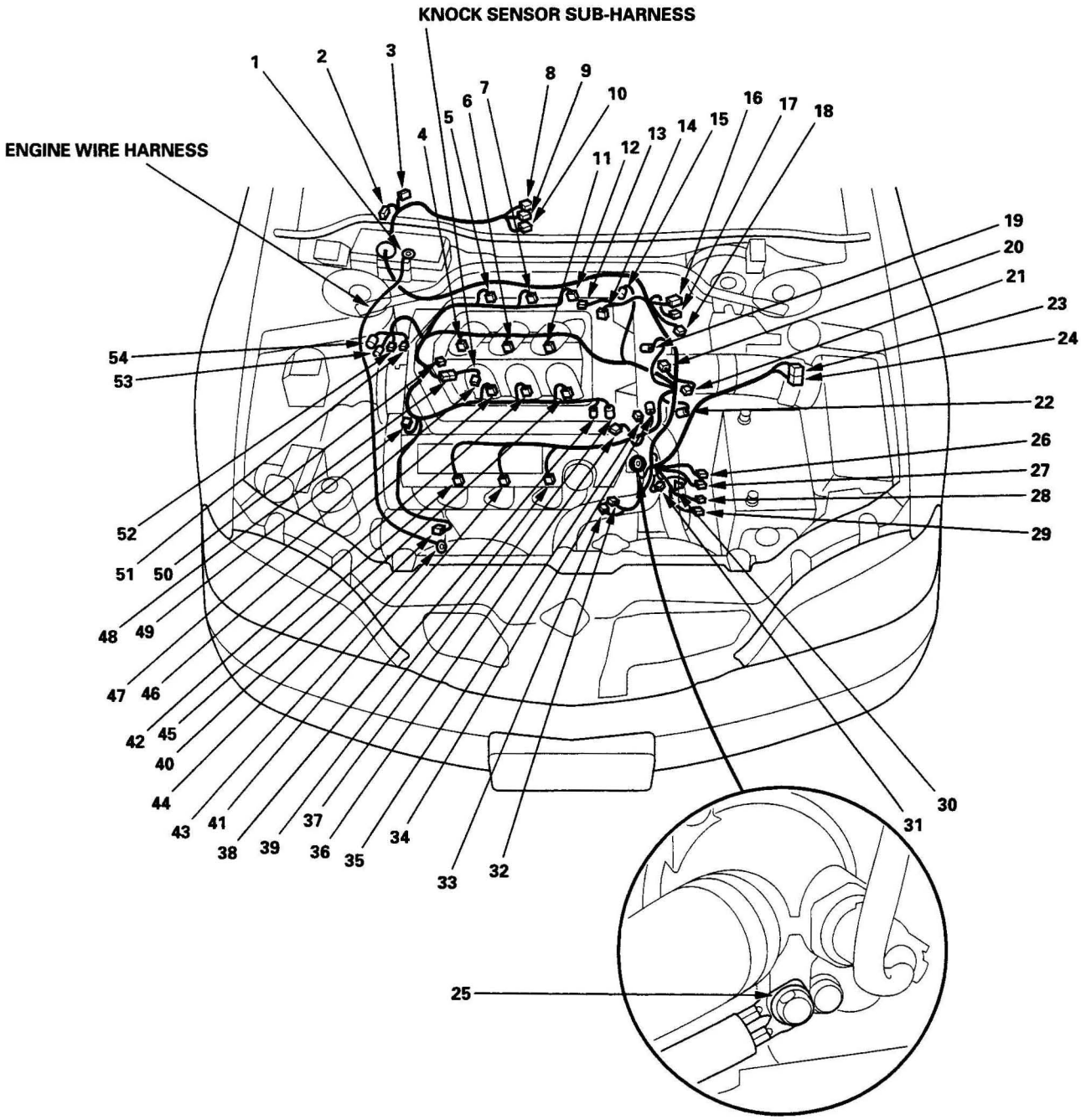
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Radiator fan switch A	22	2	Left side of engine compartment		
Radiator fan switch B	50	2	Right side of engine compartment		
Second clutch pressure switch	31	1	Left side of engine compartment		
Shift control solenoid valve B	33	2	Left side of engine compartment		
Shift control solenoid valve C	32	2	Left side of engine compartment		
Starter solenoid	30	1	Left side of engine compartment		
CMP (TDC) sensor A/B	49	4	Right side of engine compartment		
Throttle position (TP) sensor	34	3	Left side of engine compartment		
Third clutch pressure switch	29	1	Left side of engine compartment		
Vehicle speed sensor (VSS)	14	3	Left side of engine compartment		Navigation
VTEC pressure switch	54	2	Right side of engine compartment		
VTEC solenoid valve	52	1	Right side of engine compartment		
C101	23	14	Left side of engine compartment	Left engine compartment wire harness (see page 22-38)	
C102	24	10	Left side of engine compartment	Left engine compartment wire harness (see page 22-38)	
C103	48	1	Right side of engine compartment	Knock sensor sub-harness	
C104 (Junction connector A)	20	8	Left side of engine compartment		
C105 (Junction connector B)	16	14	Left side of engine compartment		
C106 (Junction connector C)	2	20	Under right side of dash		
C107 (Junction connector D)	3	20	Under right side of dash		
T101	1		Under-hood fuse/relay box		
T102	43		Alternator		
G101	25		Left side of engine compartment		

Knock Sensor Sub-harness ('99 Model)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Knock sensor	47	1	Middle of engine compartment		
C103	48	1	Right side of engine compartment	Engine wire harness	

BACK

Protected by AR



BACK

Protected by AR

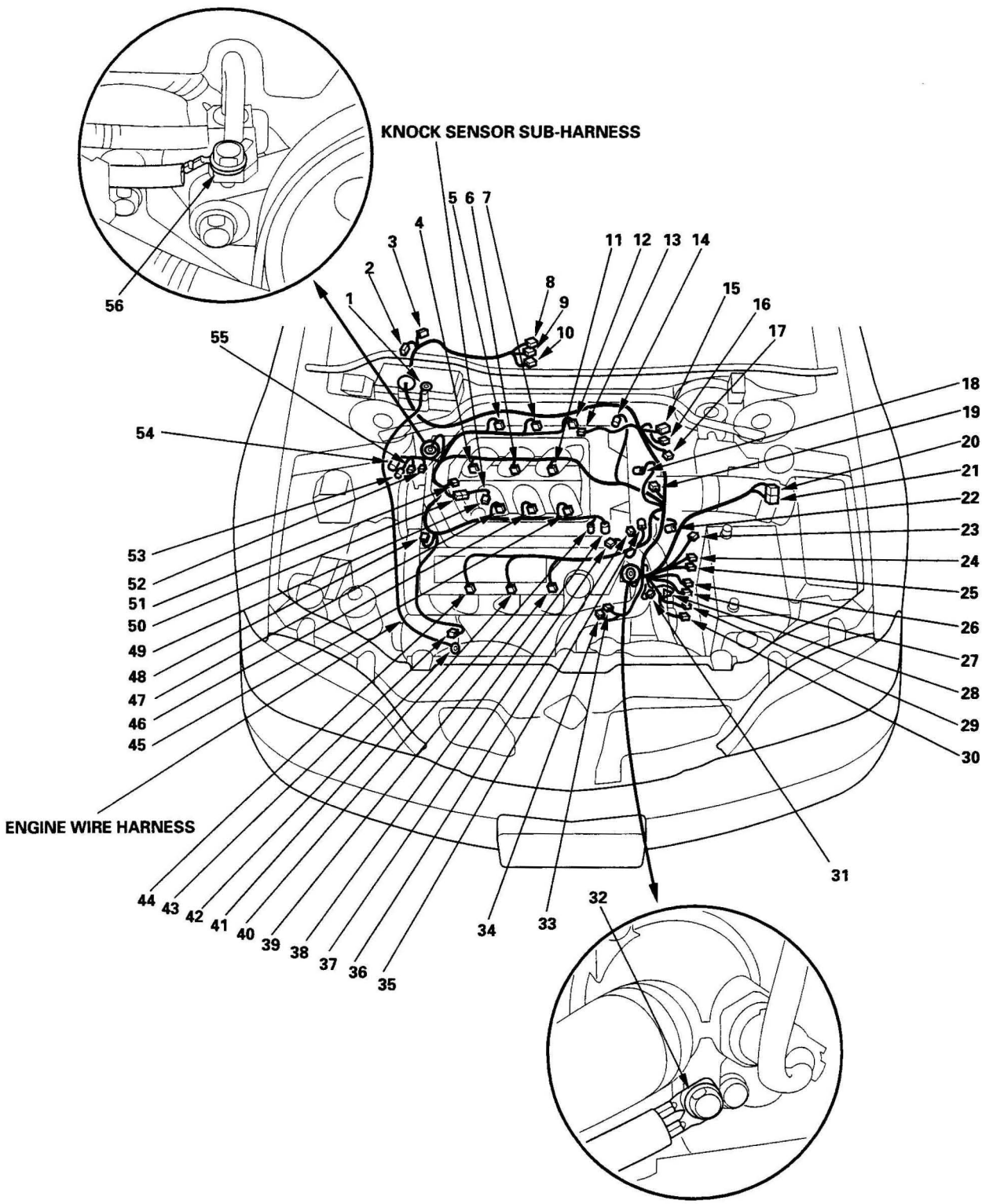
Connector to Harness Index (cont'd)

Engine Wire Harness ('00-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Alternator	43	4	Middle of engine compartment		
A/T clutch pressure control valve A	26	2	Left side of engine compartment		
A/T clutch pressure control valve B	27	2	Left side of engine compartment		
A/T clutch pressure control valve C	31	2	Left side of engine compartment		
Transmission range switch	16	10	Left side of engine compartment		
CKP sensor	52	2	Right side of engine compartment		
Countershaft speed sensor	17	3	Left side of engine compartment		
EGR valve vacuum control solenoid valve	37	6	Left side of engine compartment		
Coolant temperature gauge sending unit	40	1	Left side of engine compartment		
Engine coolant temperature (ECT) sensor	38	2	Left side of engine compartment		
Engine oil pressure switch	53	1	Right side of engine compartment		
Fourth clutch pressure switch	30	1	Left side of engine compartment		
Fuel injector No. 1	4	2	Middle of engine compartment		
Fuel injector No. 2	6	2	Middle of engine compartment		
Fuel injector No. 3	11	2	Middle of engine compartment		
Fuel injector No. 4	47	2	Middle of engine compartment		
Fuel injector No. 5	46	2	Middle of engine compartment		
Fuel injector No. 6	45	2	Middle of engine compartment		
Idle air control (IAC) valve	36	3	Left side of engine compartment		
Ignition coil No. 1	5	3	Middle of engine compartment		
Ignition coil No. 2	7	3	Middle of engine compartment		
Ignition coil No. 3	12	3	Middle of engine compartment		
Ignition coil No. 4	44	3	Middle of engine compartment		
Ignition coil No. 5	41	3	Middle of engine compartment		
Ignition coil No. 6	39	3	Middle of engine compartment		
Intake air temperature (IAT) sensor	14	2	Left side of engine compartment		
Torque converter clutch lock-up control solenoid valve	25	2	Left side of engine compartment		
Mainshaft speed sensor	29	3	Left side of engine compartment		
MAP sensor	18	3	Left side of engine compartment		
PCM connector B	8	25	Under middle of dash		
PCM connector C	9	31	Under middle of dash		
PCM connector D	10	16	Under middle of dash		

BACK

Protected by AR



(cont'd)

Protected by AR

Connector to Harness Index (cont'd)

Engine Wire Harness ('00-01 Models) (cont'd)

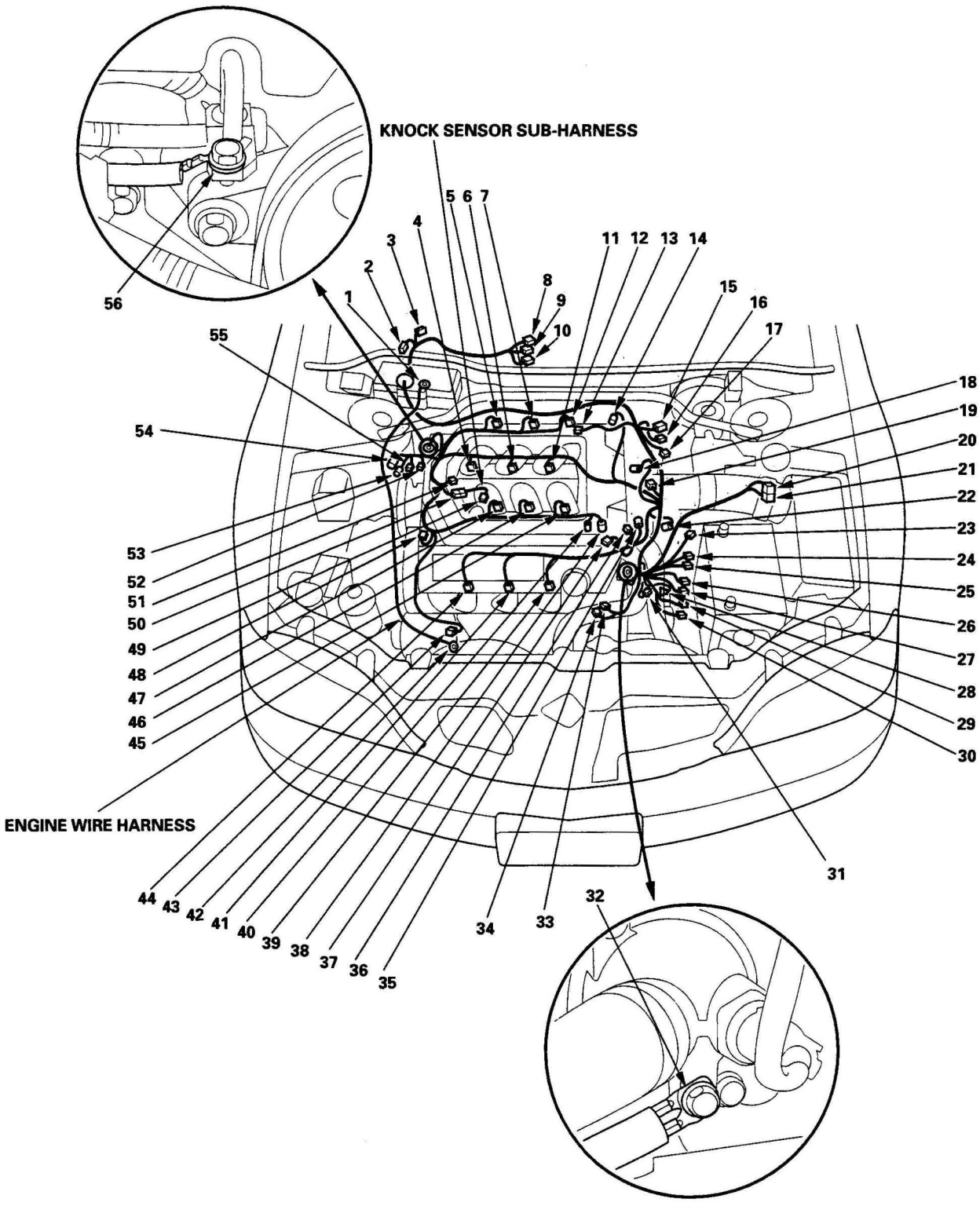
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Primary HO2S	13	4	Left side of engine compartment		
Radiator fan switch A	22	2	Left side of engine compartment		
Radiator fan switch B	51	2	Right side of engine compartment		
Shift control solenoid valve A	34	2	Left side of engine compartment		
Shift control solenoid valve B	24	2	Left side of engine compartment		
Shift control solenoid valve C	33	2	Left side of engine compartment		
Starter solenoid	28	1	Left side of engine compartment		
CMP (TDC) sensor A/B	48	4	Right side of engine compartment		
Throttle position (TP) sensor	35	3	Left side of engine compartment		
VTEC pressure switch	54	2	Right side of engine compartment		
VTEC solenoid valve	55	1	Right side of engine compartment		
C101	20	14	Left side of engine compartment	Left engine compartment wire harness (see page 22-40)	
C102	21	10	Left side of engine compartment	Left engine compartment wire harness (see page 22-40)	
C103	50	1	Right side of engine compartment	Knock sensor sub-harness	
C104 (Junction connector A)	19	8	Left side of engine compartment		
C105 (Junction connector B)	15	14	Left side of engine compartment		
C106 (Junction connector C)	2	20	Under right side of dash		
C107 (Junction connector D)	3	20	Under right side of dash		
C151	23	8	On transmission housing	A/T sub-harness (see page 22-84)	
T101	1		Under-hood fuse/ralay box		
T102	42		Alternator		
G101	32		Left side of engine compartment	Body ground via engine wire harness	
G102	56		Right side of engine compartment	Body ground via engine wire harness	

Knock Sensor Sub-harness ('00-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Knock sensor	49	1	Middle of engine compartment		
C103	50	1	Right side of engine compartment		

BACK

Protected by AR



BACK

Protected by AR

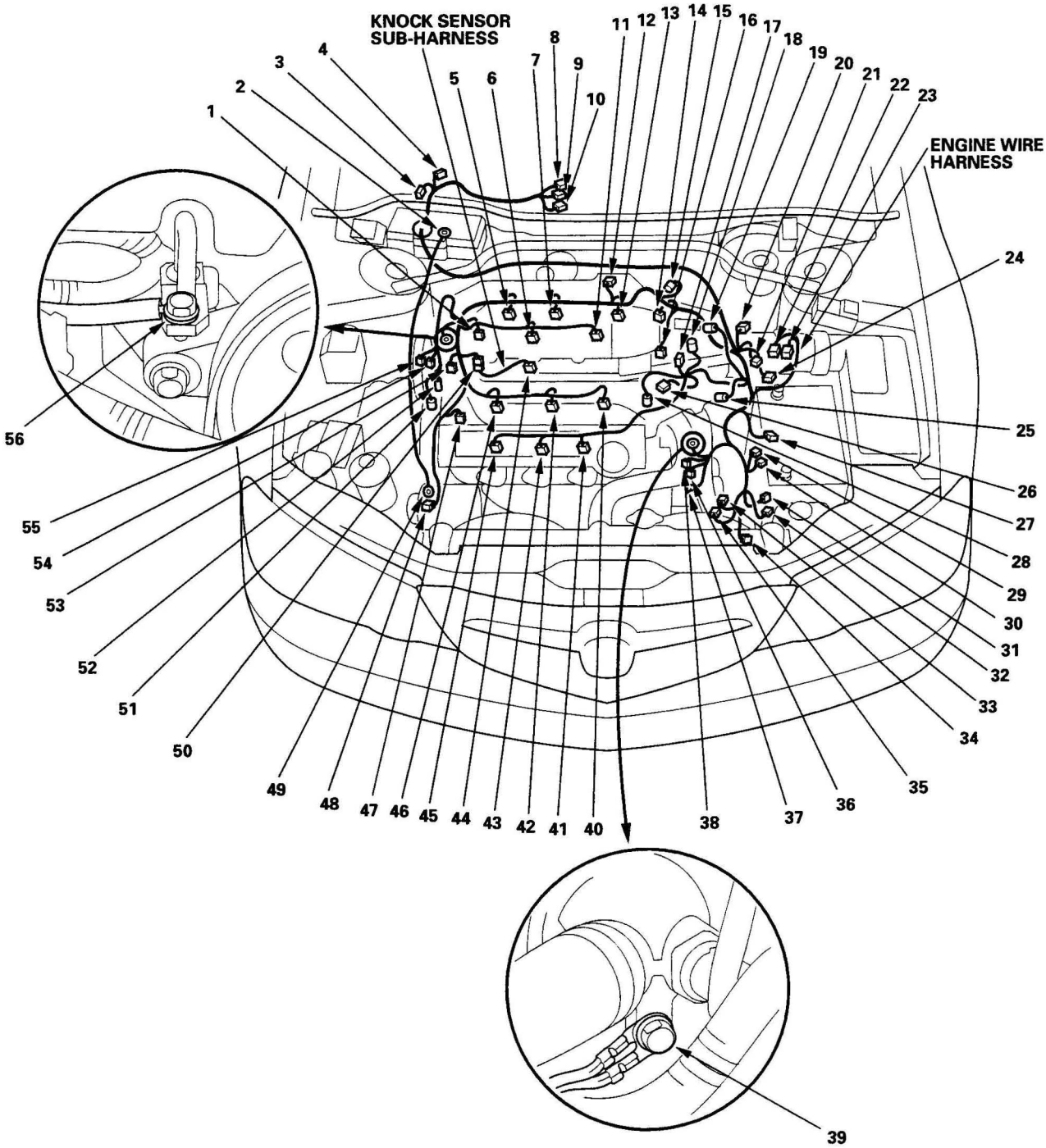
Connector to Harness Index (cont'd)

Engine Wire Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Alternator	48	4	Middle of engine compartment		
A/T clutch pressure control valve A	30	2	Left side of engine compartment		
A/T clutch pressure control valve B	29	2	Left side of engine compartment		
A/T clutch pressure control valve C	34	2	Left side of engine compartment		
CKP sensor	54	2	Right side of engine compartment		
Countershaft speed sensor	21	3	Left side of engine compartment		
EGR valve and EGR valve lift sensor	26	6	Left side of engine compartment		
Engine coolant temperature (ECT) sensor	28	2	Left side of engine compartment		
Engine oil pressure switch	52	1	Right side of engine compartment		
Fourth clutch pressure switch	32	1	Transmission housing		
Idle air control (IAC) valve	17	3	Left side of engine compartment		
Ignition coil No. 1	5	3	Middle of engine compartment		
Ignition coil No. 2	7	3	Middle of engine compartment		
Ignition coil No. 3	13	3	Middle of engine compartment		
Ignition coil No. 4	45	3	Middle of engine compartment		
Ignition coil No. 5	43	3	Middle of engine compartment		
Ignition coil No. 6	41	3	Middle of engine compartment		
Injector No. 1	1	2	Middle of engine compartment		
Injector No. 2	6	2	Middle of engine compartment		
Injector No. 3	11	2	Middle of engine compartment		
Injector No. 4	46	2	Middle of engine compartment		
Injector No. 5	42	2	Middle of engine compartment		
Injector No. 6	40	2	Middle of engine compartment		
Intake manifold runner control (IMRC) actuator	12	2	Middle of engine compartment		TYPE S
Intake air temperature (IAT) sensor	15	2	Middle of engine compartment		
Lock-up control solenoid valve	38	2	Left side of engine compartment		
Mainshaft speed sensor	31	3	Left side of engine compartment		
MAP sensor	19	3	Left side of engine compartment		
PCM connector B	8	25	Under middle of dash		
PCM connector C	9	31	Under middle of dash		
PCM connector D	10	16	Under middle of dash		
Primary heated oxygen sensor (Primary HO2S)	16	4	Left side of engine compartment		
Radiator fan switch B	25	2	Left side of engine compartment		
Radiator fan switch C	53	2	Right side of engine compartment		

BACK

Protected by AR



(cont'd)

BACK

Protected by AR

Connector to Harness Index (cont'd)

Engine Wire Harness ('02-03 Models) (cont'd)

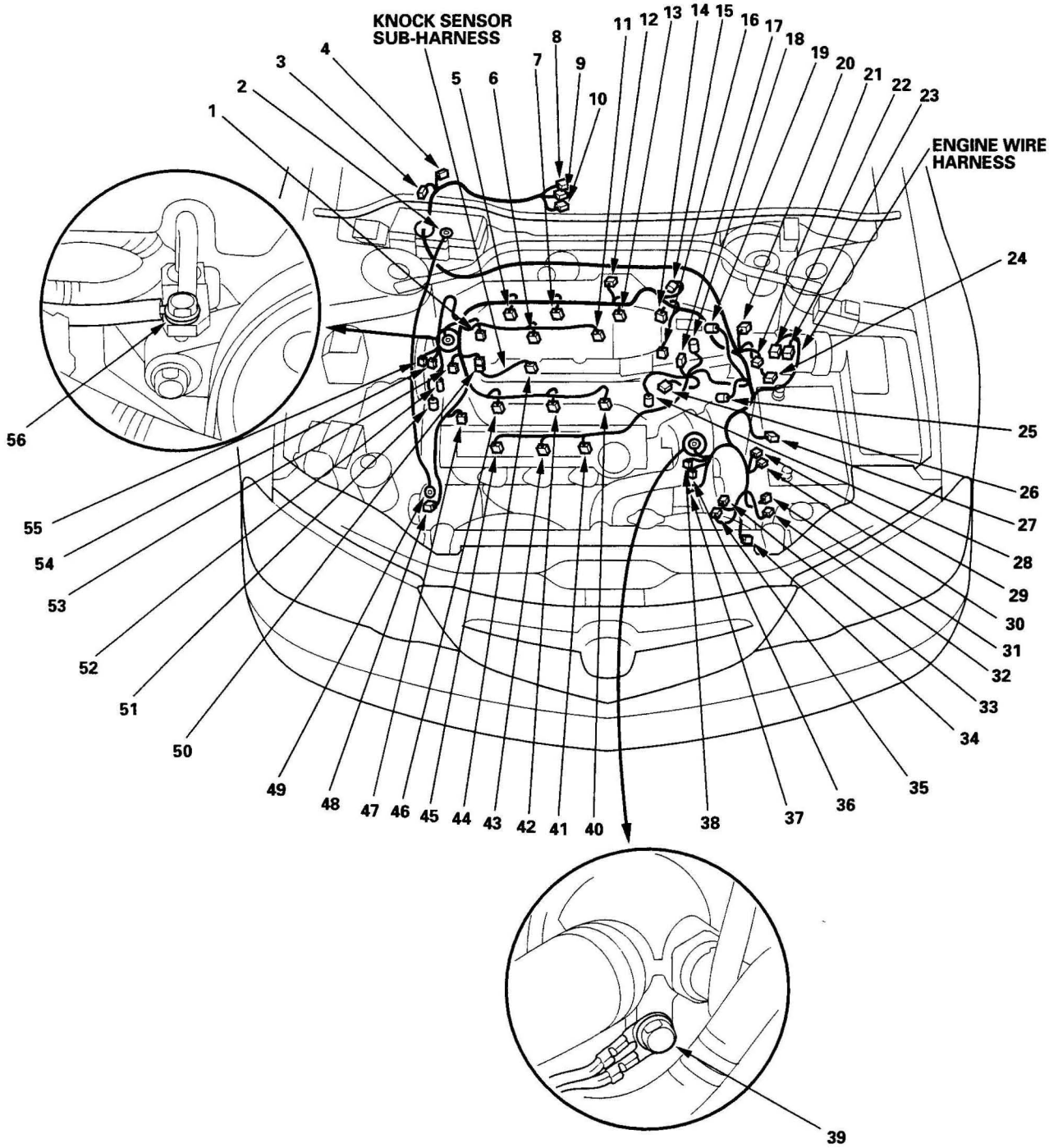
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Shift control solenoid valve A	33	2	Left side of engine compartment		
Shift control solenoid valve B	36	2	Left side of engine compartment		
Shift control solenoid valve C	35	2	Left side of engine compartment		
Starter solenoid	37	1	Left side of engine compartment		
CMP (TDC) sensor A/B	47	4	Right side of engine compartment		
Throttle position (TP) sensor	18	3	Left side of engine compartment		
Transmission range switch	24	10	Left side of engine compartment		
VTEC oil pressure switch	51	2	Right side of engine compartment		
VTEC solenoid valve	55	1	Right side of engine compartment		
C101	22	14	Left side of engine compartment	Left engine compartment wire harness (see page 22-42)	
C102	23	10	Left side of engine compartment	Left engine compartment wire harness (see page 22-42)	
C103	50	1	Middle of engine compartment	Knock sensor sub-harness	
C104 (Junction connector A)	14	8	Left side of engine compartment		
C105 (Junction connector B)	20	14	Left side of engine compartment		
C106 (Junction connector C)	3	20	Under middle of dash		
C107 (Junction connector D)	4	20	Under middle of dash		
C151	27	8	Left side of engine compartment	A/T sub-harness (see page 22-84)	
T101	2		Under-hood fuse/relay box		
T102	49		Alternator		
G101	39		Left side of engine compartment	Engine ground via engine wire harness	
G102	56		Right side of engine compartment	Engine ground via engine wire harness	

Knock Sensor Sub-harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Knock sensor	44	1	Middle of engine compartment		
C103	50	1	Right side of engine compartment	Engine wire harness	

BACK

Protected by AR



BACK

Protected by AR

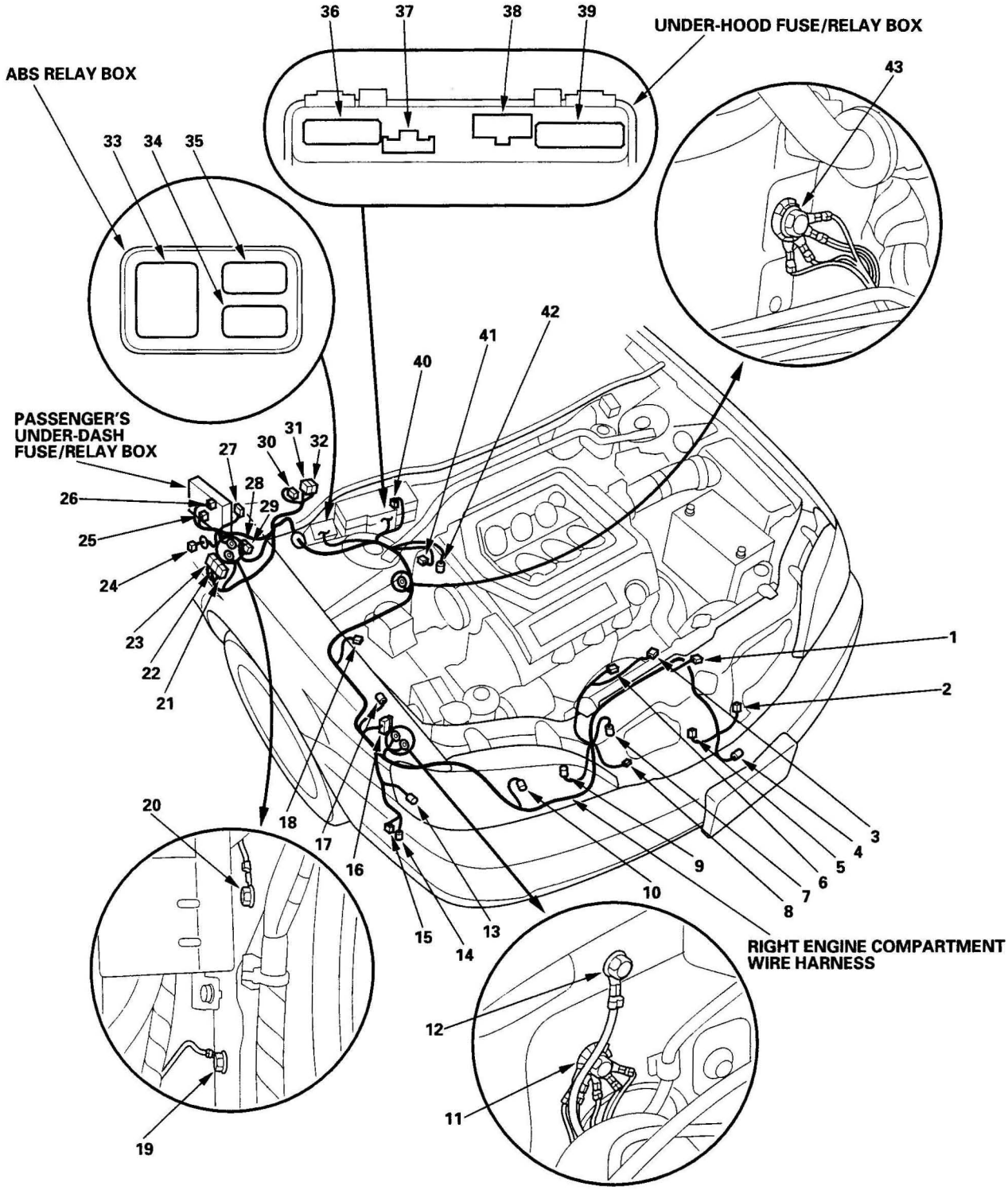
Connector to Harness Index (cont'd)

Right Engine Compartment Wire Harness ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS fail-safe relay	35	4	Right side of engine compartment		
ABS pump motor relay	33	4	Right side of engine compartment		
ABS right front wheel sensor	18	2	Right side of engine compartment		
ABS/TCS control unit connector A	21	26	Behind right kick panel		
ABS/TCS control unit connector B	22	16	Behind right kick panel		
ABS/TCS control unit connector C	23	12	Behind right kick panel		
ABS/TCS modulator unit	16	24	Right side of engine compartment		
A/C compressor clutch	8	1	Middle of engine compartment		
A/C pressure switch	7	2	Middle of engine compartment		
Condenser fan motor	6	2	Middle of engine compartment		
Cruise control actuator	17	4	Right side of engine compartment		
ELD unit (see page 22-92)	40	3	Into under-hood fuse/relay box		
High beam cut relay	28	4	Behind right kick panel		Canada ('99 model)
Horn (high)	2	1	Behind middle of front bumper		'99 model
Horn (low)	5	1	Behind middle of front bumper		
Keyless buzzer	24	2	Behind right fender		'00-01 models
Navigation relay	28	4	Behind right kick panel		Navigation ('99 model)
Outside air temperature sensor	4	2	Behind middle of front bumper		
Passenger's under-dash fuse/rely box connector C (see page 22-94)	25	18	Behind right kick panel		
Passenger's under-dash fuse/relay box connector D (see page 22-94)	26	3	Behind right kick panel		
Power steering pressure (PSP) switch	42	2	Right side of engine compartment		
Radiator fan motor	3	2	Middle of engine compartment		
Right headlight (high)	9	2	Behind right headlight		
Right headlight (low)	10	2	Behind right headlight		
Right side marker and turn signal lights	13	3	Behind right headlight		

BACK

Protected by AR



(cont'd)

BACK

Protected by AR

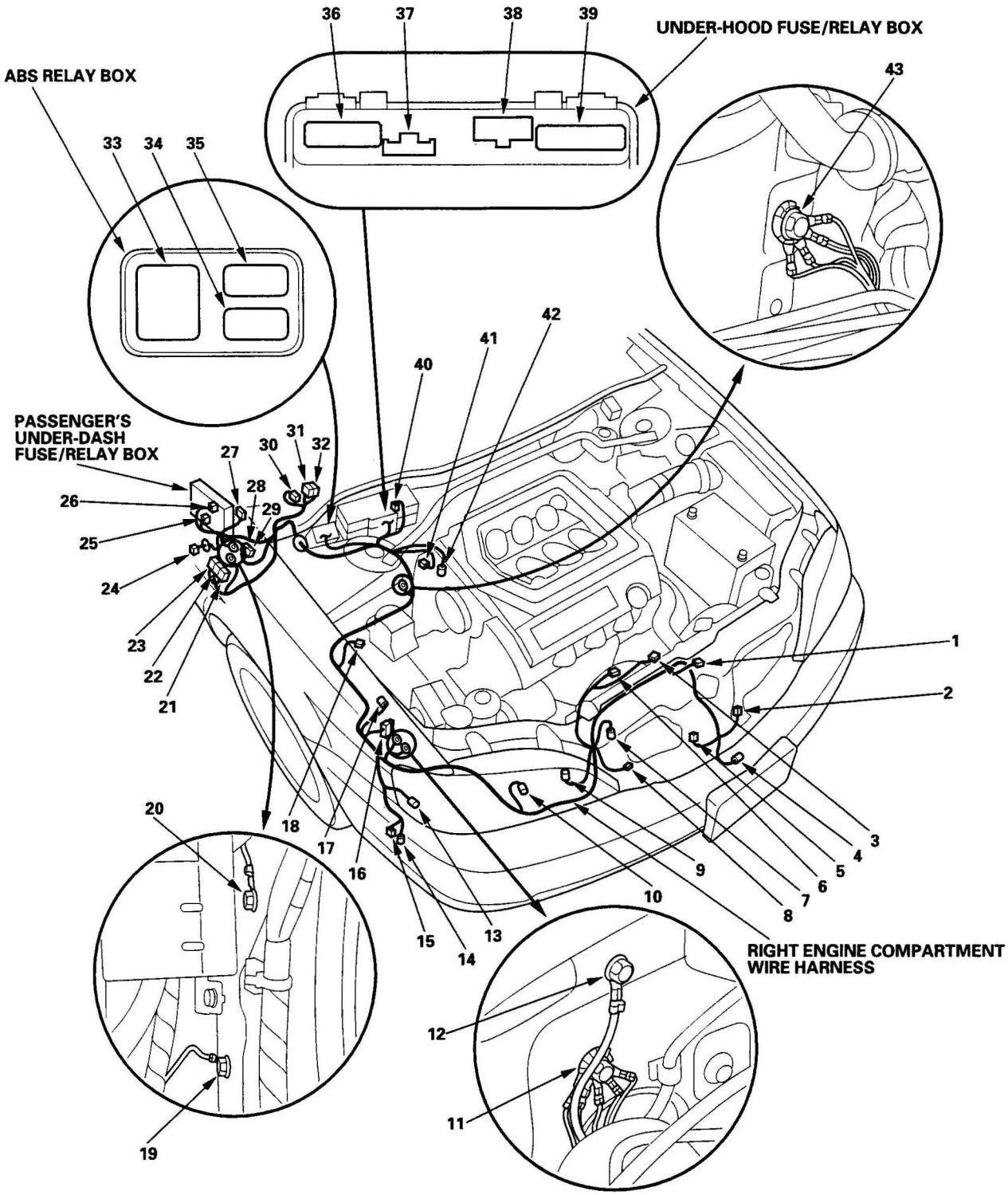
Connector to Harness Index (cont'd)

Right Engine Compartment Wire Harness ('99-01 Models)(cont'd)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Secondary heated oxygen sensor (Secondary HO2S)	41	4	Right side of engine compartment		
Security hood switch	1	2	Under hood latch		
Taillight relay	29	4	Right side of engine compartment		'99 model
TCS relay	34	4	Right side of engine compartment		
Under-hood fuse/relay box connector A (see page 22-92)	39	18	Right side of engine compartment		
Under-hood fuse/relay box connector B (see page 22-92)	38	7	Right side of engine compartment		
Under-hood fuse/relay box connector C (see page 22-92)	37	3	Right side of engine compartment		
Under-hood fuse/relay box connector D (see page 22-92)	36	16	Right side of engine compartment		
Washer fluid level switch	14	2	Behind right of front bumper		Canada
Windshield washer motor	15	2	Behind right of front bumper		
C201	32	16	Behind right side of dash	Dashboard wire harness B (see page 22-44)	
C202	31	7	Behind right side of dash	Dashboard wire harness B (see page 22-44)	
C203	30	5	Behind right side of dash	Dashboard wire harness B (see page 22-44)	
C204	27	24	Behind right kick panel	Dashboard wire harness A (see page 22-52)	
G201	11		Right side of engine compartment	Body ground via right engine compartment wire harness	
G202	43		Right side of engine compartment	Body ground via right engine compartment wire harness	
G203	12		Right side of engine compartment	Body ground via right engine compartment wire harness	
G402	20		Behind right kick panel	Body ground via right engine compartment wire harness	
G403	19		Behind right kick panel	Body ground via right engine compartment wire harness	

BACK

Protected by AR



Protected by AR

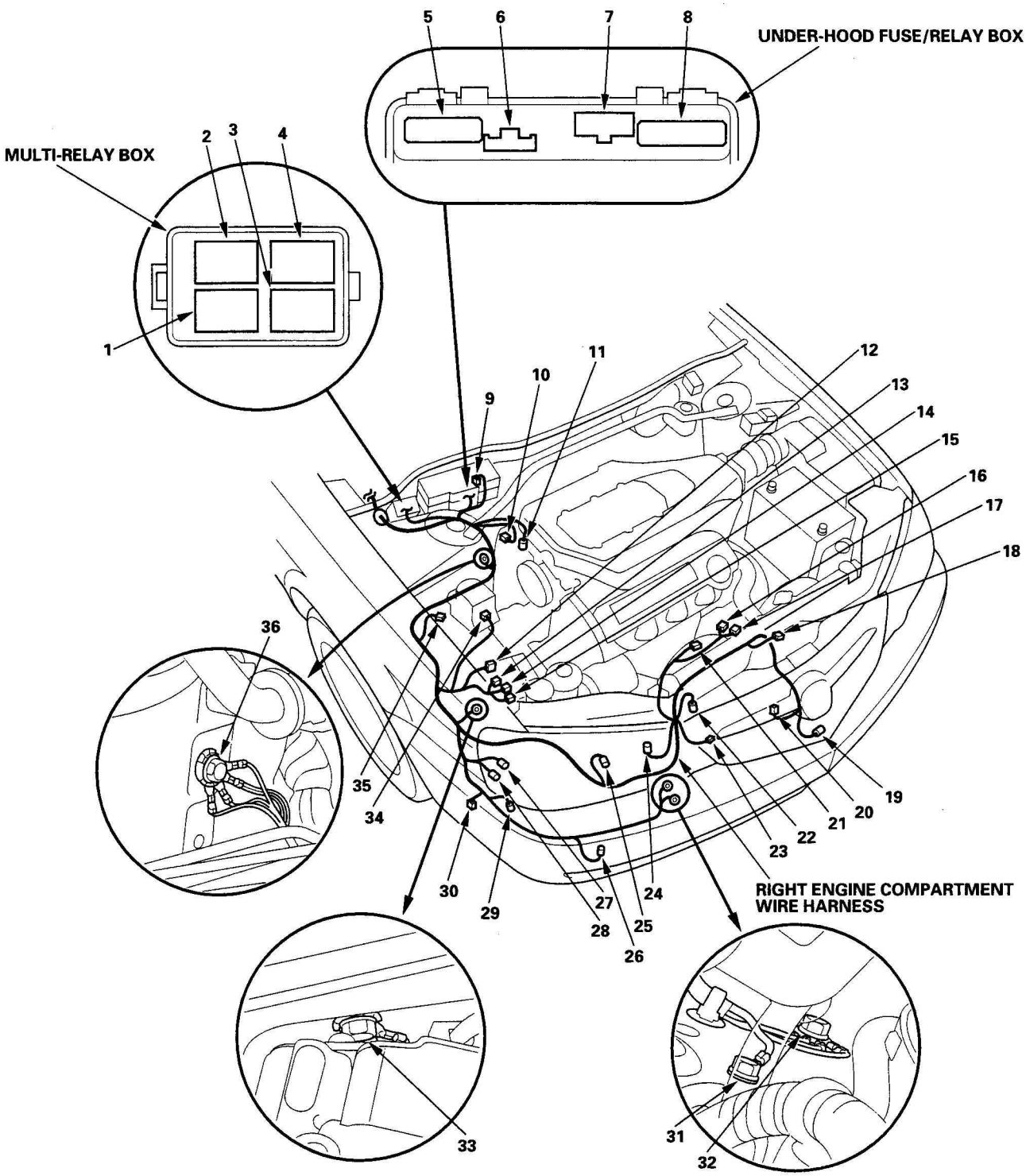
Connector to Harness Index (cont'd)

Right Engine Compartment Wire Harness (Engine compartment) ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS fail-safe relay	3	4	Right side of engine compartment		
ABS pump motor	14	2	Right side of engine compartment		TYPE S
ABS right front wheel sensor	35	2	Right side of engine compartment		
ABS/TCS modulator unit	12	24	Right side of engine compartment		PREMIUM
A/C compressor clutch	23	1	Middle of engine compartment		
A/C pressure switch	22	4	Middle of engine compartment		TYPE S
A/C pressure switch	22	2	Middle of engine compartment		PREMIUM
Condenser fan motor	21	2	Middle of engine compartment		
Cruise control actuator	34	4	Right side of engine compartment		
ELD unit	9	3	Into under-hood fuse/relay box		
Fan control relay	2	5	Right side of engine compartment		TYPE S
Horn (low)	20	1	Behind middle of front bumper		
Outside air temperature sensor	19	2	Behind middle of front bumper		
Power steering pressure (PSP) switch	11	2	Right side of engine compartment		
Radiator fan motor	17	2	Middle of engine compartment		
Radiator fan switch A	16	2	Middle of engine compartment		TYPE S
Right fog light	26	2	Behind right fog light		
Right headlight (high)	24	2	Behind right headlight		
Right headlight (low)	25	2	Behind right headlight		
Right parking/turn signal lights	27	3	Behind right headlight		
Right side marker light	28	2	Behind right headlight		
Secondary heated oxygen sensor (Secondary HO2S)	10	4	Right side of engine compartment		
Security hood switch	18	2	Under hood latch		
TCS relay	4	4	Right side of engine compartment		PREMIUM
Under-hood fuse/relay box connector A (see page 22-92)	8	18	Behind under-hood fuse/relay box		
Under-hood fuse/relay box connector B (see page 22-92)	7	7	Behind under-hood fuse/relay box		
Under-hood fuse/relay box connector C (see page 22-92)	6	3	Behind under-hood fuse/relay box		
Under-hood fuse/relay box connector D (see page 22-92)	5	16	Behind under-hood fuse/relay box		
VSA relay	4	4	Right side of engine compartment		TYPE S
VSA modulator unit connector A	13	10	Right side of engine compartment		TYPE S
VSA modulator unit connector B	15	8	Right side of engine compartment		TYPE S
VSA throttle motor relay	1	4	Right side of engine compartment		TYPE S
Washer fluid level switch	29	2	Behind right of front bumper		Canada
Windshield washer motor	30	2	Behind right of front bumper		
G201	32		Below right headlight	Body ground, via right engine compartment wire harness	
G202	36		Right side of engine compartment	Body ground, via right engine compartment wire harness	
G203	31		Below right headlight	Body ground, via right engine compartment wire harness	
G204	33		Right side of engine compartment	Body ground, via right engine compartment wire harness	

BACK

Protected by AR



(cont'd)

Protected by AR

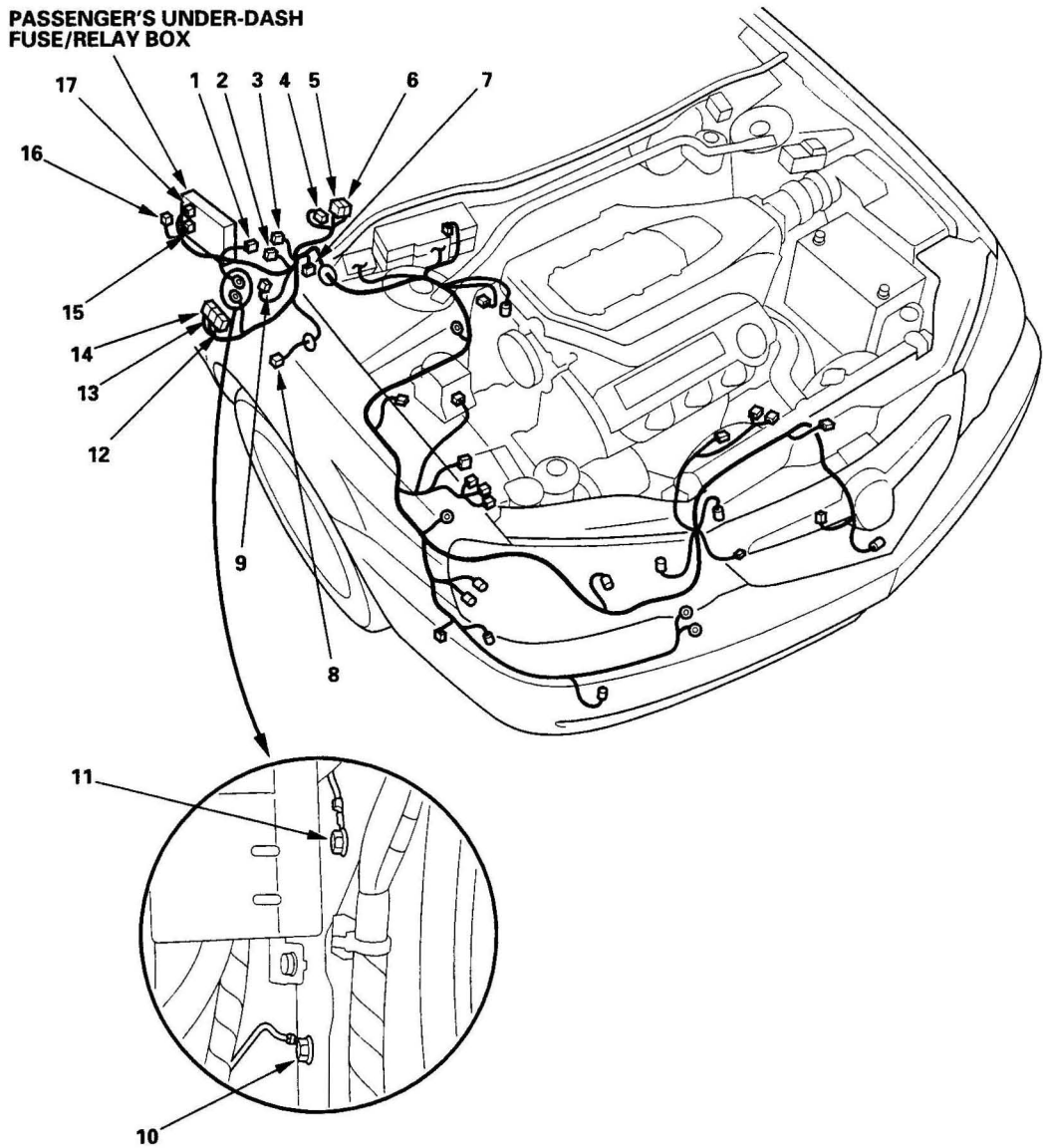
Connector to Harness Index (cont'd)

Right Engine Compartment Wire Harness (Dashboard) ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS/TCS control unit connector A	12	26	Behind right kick panel		PREMIUM
ABS/TCS control unit connector B	13	16	Behind right kick panel		PREMIUM
ABS/TCS control unit connector C	14	12	Behind right kick panel		PREMIUM
Diode A (for A/C)	1	2	Under right side of dash		TYPE S
Diode B (for A/C)	2	2	Under right side of dash		TYPE S
Diode C (for A/C)	3	2	Under right side of dash		TYPE S
Fog light relay	9	4	Under right side of dash		
Keyless buzzer	8	2	Behind right fender		
Passenger's under-dash fuse/relay box connector C (see page 22-94)	15	18	Behind right kick panel		
Passenger's under-dash fuse/relay box connector D (see page 22-94)	17	3	Behind right kick panel		
VSA control unit connector A	12	22	Behind right kick panel		TYPE S
VSA control unit connector B	13	16	Behind right kick panel		TYPE S
VSA control unit connector C	14	26	Behind right kick panel		TYPE S
C201	5	16	Under right side of dash	Dashboard wire harness B (see page 22-48)	
C202	6	7	Under right side of dash	Dashboard wire harness B (see page 22-48)	
C203	4	20	Under right side of dash	Dashboard wire harness B (see page 22-48)	TYPE S
C203	4	12	Under right side of dash	Dashboard wire harness B (see page 22-48)	PREMIUM
C204	16	24	Under right side of dash	Dashboard wire harness A (see page 22-56)	
C205 (Junction connector)	7	20	Under right side of dash		TYPE S
G402	11		Under right side of dash	Body ground, via right engine compartment wire harness	
G403	10		Under right side of dash	Body ground, via right engine compartment wire harness	

BACK

Protected by AR



Protected by AR

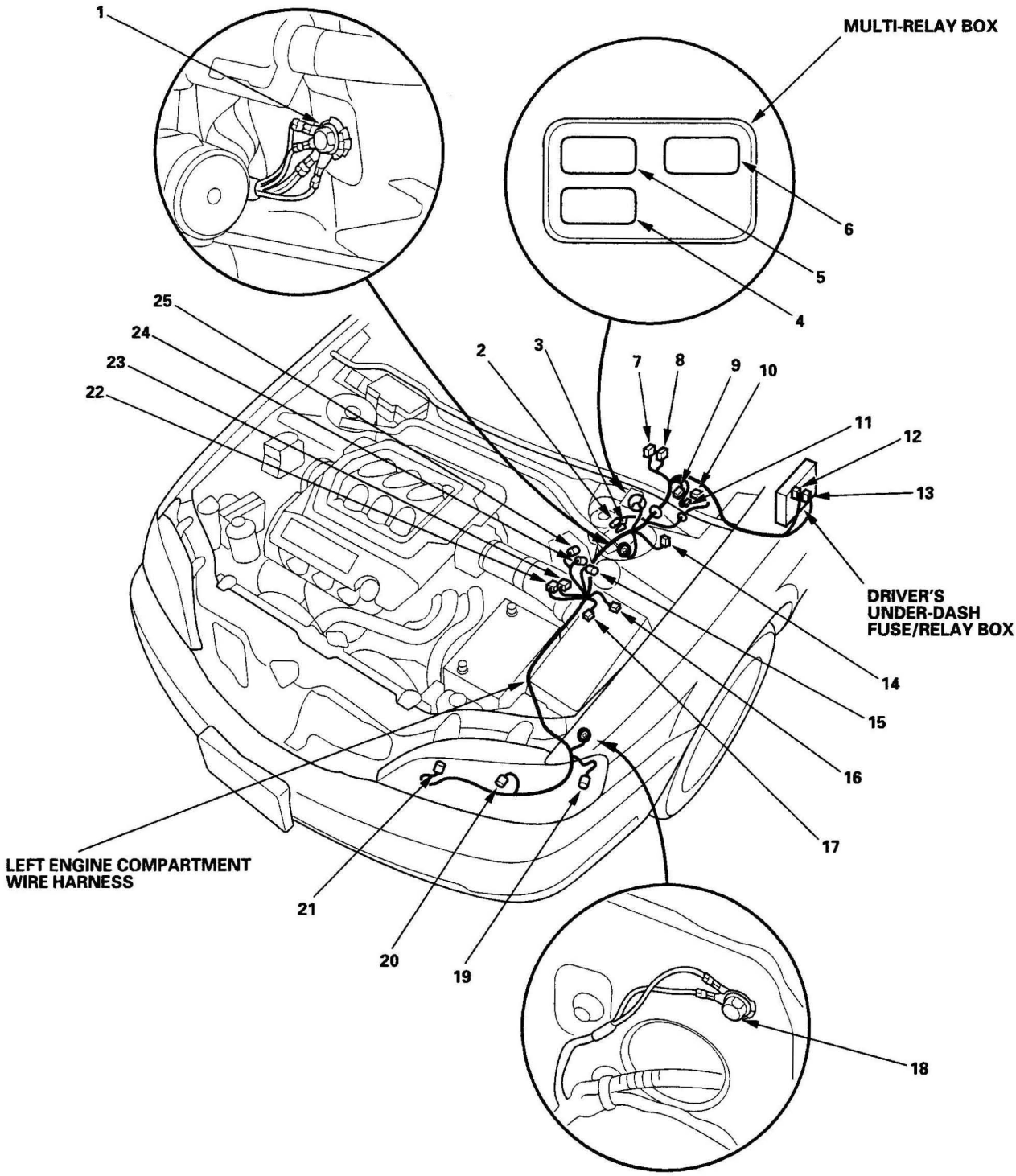
Connector to Harness Index (cont'd)

Left Engine Compartment Wire Harness ('99 Model)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS left front wheel sensor	16	2	Left side of engine compartment		
Brake fluid level switch connector (+)	2	1	Left side of engine compartment		
Brake fluid level switch connector (−)	3	1	Left side of engine compartment		
Driver's under-dash fuse/relay box connector C (see page 22-93)	12	5	Behind left kick panel		
Driver's under-dash fuse/relay box connector E (see page 22-93)	13	20	Behind left kick panel		
Engine mount control solenoid valve	25	2	Left side of engine compartment		
EVAP canister purge valve	24	2	Left side of engine compartment		
Left headlight (high)	21	2	Behind left headlight		
Left headlight (low)	20	2	Behind left headlight		
Left side marker and turn signal lights	19	3	Behind left headlight		
Parking brake switch	11	1	Under left side of dash		
Seat heater relay	4	4	Left side of engine compartment		
Security horn	15	2	Left side of engine compartment		
Security horn relay	5	4	Left side of engine compartment		
Shift lock relay	6	4	Left side of engine compartment		
Test tachometer connector	17	2	Left side of engine compartment		
Windshield wiper intermittent relay	14	6	Left side of engine compartment		
Windshield wiper motor	10	5	Left side of engine compartment		
C101	23	14	Left side of engine compartment	Engine wire harness (see page 22-18)	
C102	22	10	Left side of engine compartment	Engine wire harness (see page 22-18)	
C301	7	18	Under left side of dash	Dashboard wire harness A (see page 22-52)	
C302	8	20	Under left side of dash	Dashboard wire harness B (see page 22-44)	
C303 (Junction connector E)	9	20	Under left side of dash		
G301	18		Left side of engine compartment	Body ground via left engine compartment wire harness	
G302	1		Left side of engine compartment	Body ground via left engine compartment wire harness	

BACK

Protected by AR



Protected by AR

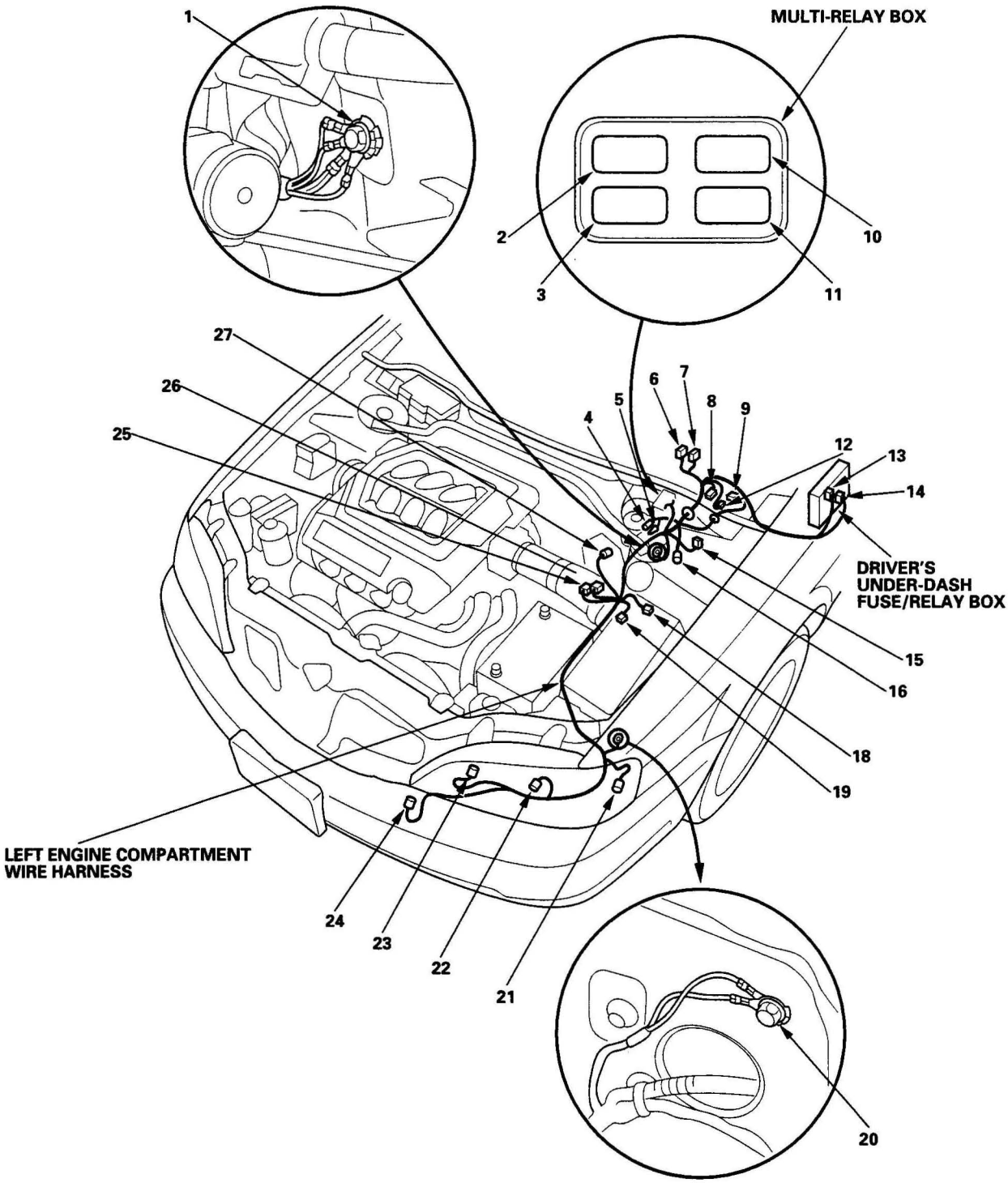
Connector to Harness Index (cont'd)

Left Engine Compartment Wire Harness ('00-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS left front wheel sensor	18	2	Left side of engine compartment		
Brake fluid level switch connector (+)	4	1	Left side of engine compartment		
Brake fluid level switch connector (−)	5	1	Left side of engine compartment		
Driver's under-dash fuse/relay box connector C (see page 22-93)	13	5	Behind left kick panel		
Driver's under-dash fuse/relay box connector E (see page 22-93)	14	20	Behind left kick panel		
Engine mount control solenoid valve	27	2	Left side of engine compartment		
EVAP canister purge valve	16	2	Left side of engine compartment		
High beam cut relay	10	4	Left side of engine compartment		
Horn (high)	24	1	Left side of engine compartment		
Left headlight (high)	23	2	Behind left headlight		
Left headlight (low)	22	2	Behind left headlight		
Left side marker and turn signal lights	21	3	Behind left headlight		
Parking brake switch	12	1	Under left side of dash		
Seat heater relay	11	4	Left side of engine compartment		
Shift lock relay	3	4	Left side of engine compartment		
Taillight relay	2	4	Left side of engine compartment		
Test tachometer connector	19	2	Left side of engine compartment		
Windshield wiper intermittent relay	15	6	Left side of engine compartment		
Windshield wiper motor	9	5	Left side of engine compartment		
C101	25	14	Left side of engine compartment	Engine wire harness (see page 22-22)	
C102	26	10	Left side of engine compartment	Engine wire harness (see page 22-22)	
C301	6	18	Under left side of dash	Dashboard wire harness A (see page 22-52)	
C302	7	20	Under left side of dash	Dashboard wire harness B (see page 22-44)	
C303 (Junction connector E)	8	20	Under left side of dash		
G301	20		Left side of engine compartment	Body ground via left side wire harness	
G302	1		Left side of engine compartment	Body ground via left side wire harness	

BACK

Protected by AR



Protected by AR

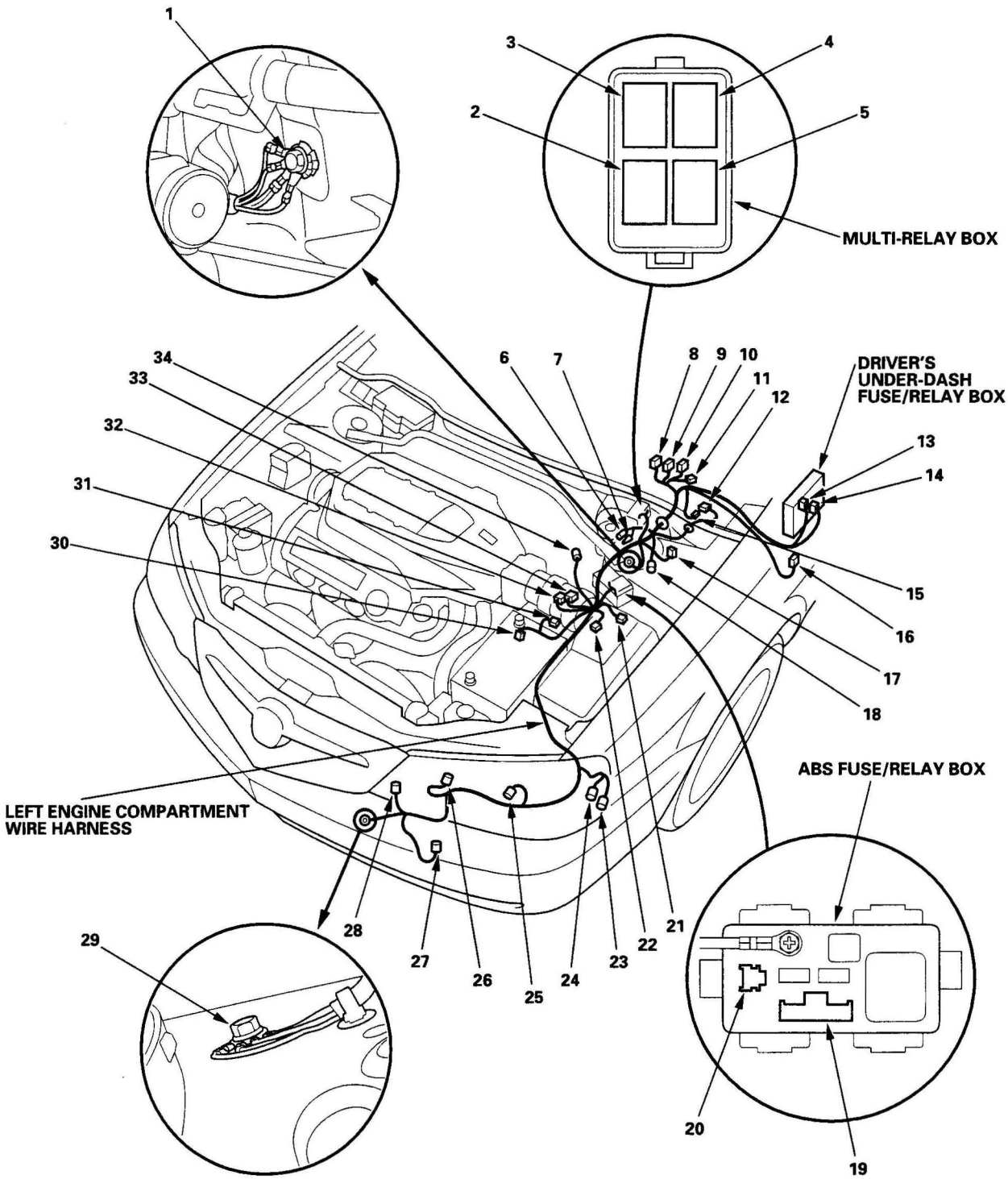
Connector to Harness Index (cont'd)

Left Engine Compartment Wire Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS left front wheel sensor	21	2	Left side of engine compartment		
ABS fuse/relay box connector A	20	2	Left side of engine compartment		
ABS fuse/relay box connector B	19	3	Left side of engine compartment		
Brake fluid level switch connector (+)	6	1	Left side of engine compartment		
Brake fluid level switch connector (−)	7	1	Left side of engine compartment		
Diode (for daytime running lights)	11	2	Under left side of dash		Canada
Driver's under-dash fuse/relay box connector C (see page 22-93)	13	5	Under left side of dash		
Driver's under-dash fuse/relay box connector E (see page 22-93)	14	20	Under left side of dash		
Engine mount control solenoid valve	34	2	Left side of engine compartment		
EVAP purge control solenoid valve	18	2	Left side of engine compartment		
High beam cut relay	5	4	In multi-relay box		Canada
Horn (high)	28	1	Below left headlight		
Intake manifold runner control module	16	14	Behind left kick panel		
Left fog light	27	2	Behind left fog light		
Left front parking/turn signal light	24	3	Behind left headlight		
Left front side marker light	23	2	Behind left headlight		
Left headlight (high)	26	2	Behind left headlight		
Left headlight (low)	25	2	Behind left headlight		
Parking brake switch	15	1	Under left side of dash		
Seat heater main relay	2	4	In multi-relay box		
Shift lock relay	3	5	In multi-relay box		
Taillight relay	4	4	In multi-relay box		
Test tachometer connector	22	2	Left side of engine compartment		
Throttle position sensor	31	3	Left side of engine compartment		TYPE S
Throttle motor	30	2	Left side of engine compartment		TYPE S
Windshield wiper intermittent relay	17	6	Left side of engine compartment		
Windshield wiper motor	12	5	Under left side of air scoop		
C101	33	10	Left side of engine compartment	Engine wire harness (see page 22-26)	
C102	32	14	Left side of engine compartment	Engine wire harness (see page 22-26)	
C301	8	16	Under left side of dash	Dashboard wire harness A (see page 22-56)	
C302	9	20	Under left side of dash	Dashboard wire harness B (see page 22-48)	
C304	10	10	Under left side of dash	Dashboard wire harness B (see page 22-48)	
G301	29		Left side of engine compartment	Body ground, via left engine compartment wire harness	
G302	1		Left side of engine compartment	Body ground, via left engine compartment wire harness	

BACK

Protected by AR



BACK

Protected by AR

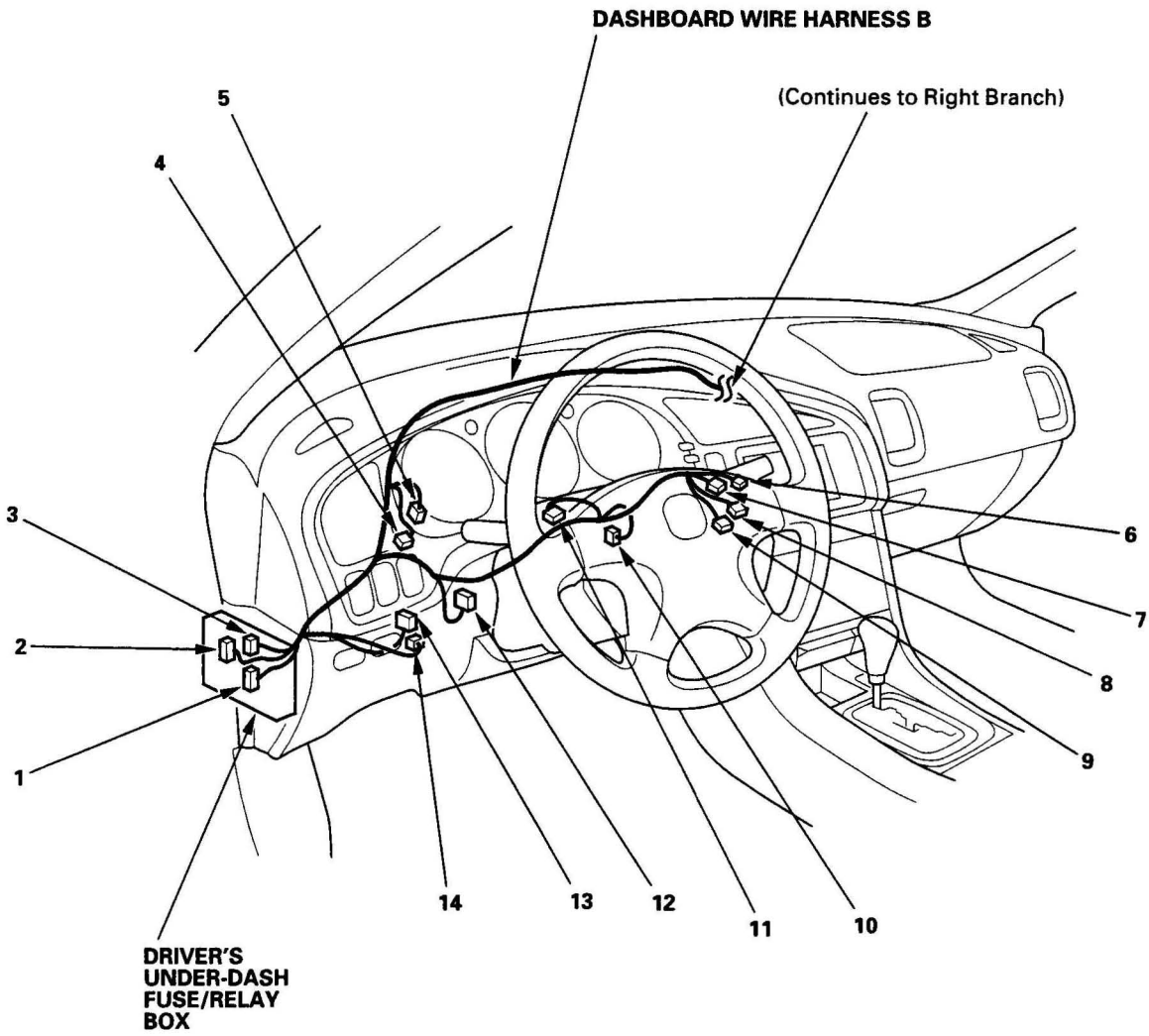
Connector to Harness Index (cont'd)

Dashboard Wire Harness B (Left branch) ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Brake switch	14	4	Under left side of dash		
Cable reel	10	4	Under left side of dash		
Combination light switch	11	14	Under left side of dash		
Daytime running lights control unit	12	14	Under left side of dash		Canada
Driver's under-dash fuse/relay box connector O (see page 22-93)	1	20	Behind left kick panel		
Driver's under-dash fuse/relay box connector P (see page 22-93)	3	7	Behind left kick panel		
Driver's under-dash fuse/relay box connector Q (see page 22-93)	2	22	Behind left kick panel		
Ignition key switch	8	7	Under left side of dash		
Immobilizer receiver unit	7	5	Under left side of dash		
Intermittent dwell time controller	6	2	Under left side of dash		
PGM-FI main relay	13	7	Under left side of dash		
Windshield wiper/washer switch	9	8	Under left side of dash		
C302	5	20	Under left side of dash	Left engine compartment wire harness (see page 22-38)	'99 model
C302	5	20	Under left side of dash	Left engine compartment wire harness (see page 22-40)	'00-01 models
C401	4	14	Under left side of dash	Dashboard wire harness A (see page 22-52)	

BACK

Protected by AR



(cont'd)

Protected by AR

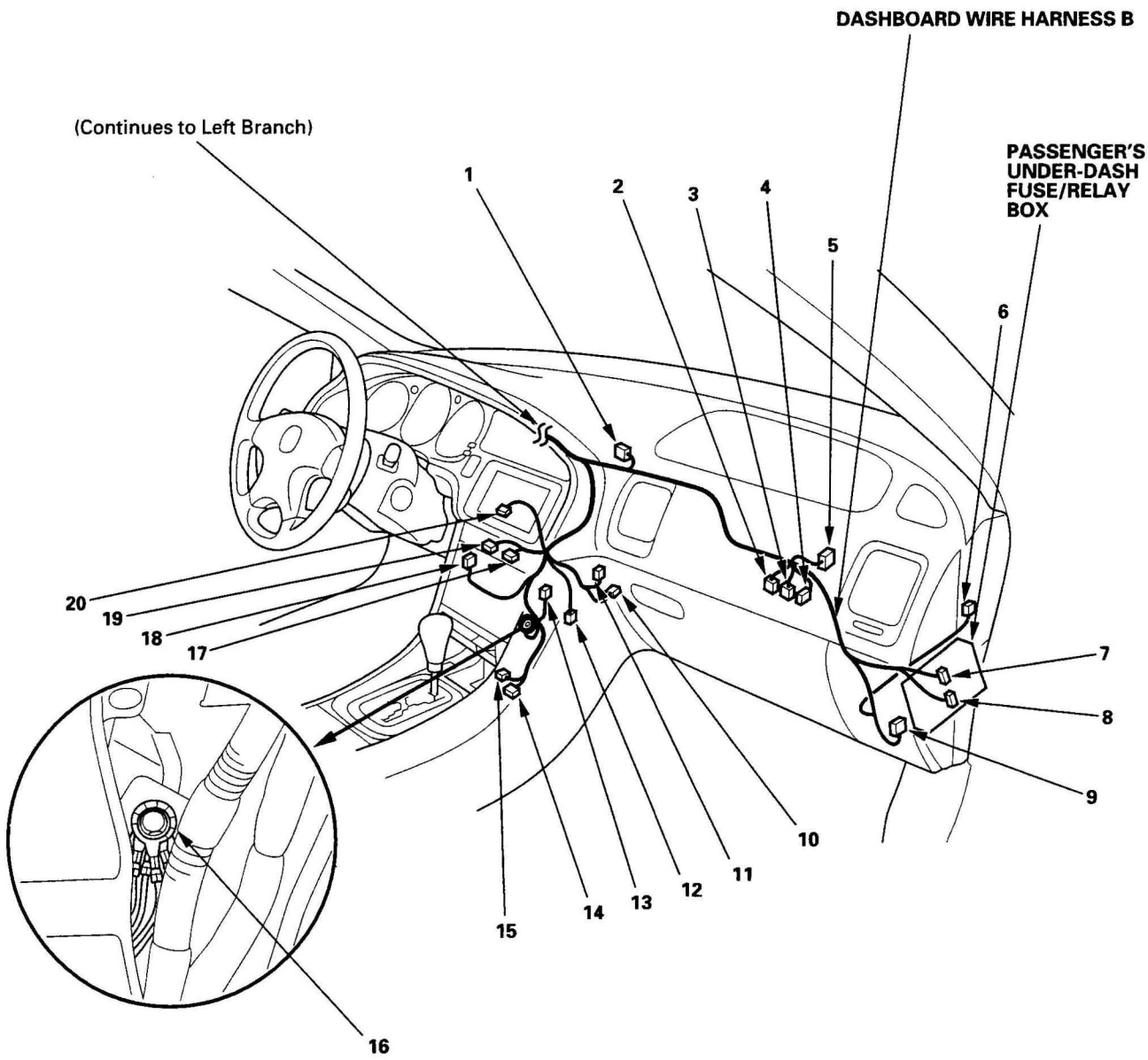
Connector to Harness Index (cont'd)

Dashboard Wire Harness B (Right branch) ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Air mix control motor	10	5	Under right side of dash		
Blower motor	9	2	Under right side of dash		
Climate control unit connector A	17	12	Under middle of dash		
Climate control unit connector B	19	20	Under middle of dash		
Data link connector (DLC)	14	16	Under right side of dash		
Evaporator temperature sensor	11	2	Under right side of dash		
Fan control module	13	8	Under right side of dash		
Mode control motor	18	10	Under left side of dash		
Navigation display unit connector A	20	5	Under middle of dash		
Passenger's under-dash fuse/relay box connector J (see page 22-94)	7	16	Behind right kick panel		
Passenger's under-dash fuse/relay box connector K (see page 22-94)	8	16	Behind right kick panel		
Power transistor	6	5	Behind right kick panel		
Recirculation control motor	5	5	Under right side of dash		
Trunk lid opener main switch	12	2	Under right side of dash		
C201	2	16	Under right side of dash	Right engine compartment wire harness (see page 22-30)	
C202	3	7	Under right side of dash	Right engine compartment wire harness (see page 22-30)	
C203	4	5	Under right side of dash	Right engine compartment wire harness (see page 22-30)	
C402	1	14	Under right side of dash	Dashboard wire harness A (see page 22-52)	
C403	15	2	Under middle of dash	Front accessory power socket sub-harness (see page 22-86)	'99 model
C403	15	4	Under middle of dash	Front accessory power socket sub-harness (see page 22-86)	'00-01 models
G401	16		Under middle of dash	Body ground via dashboard wire harness B	

BACK

Protected by AR



Protected by AR

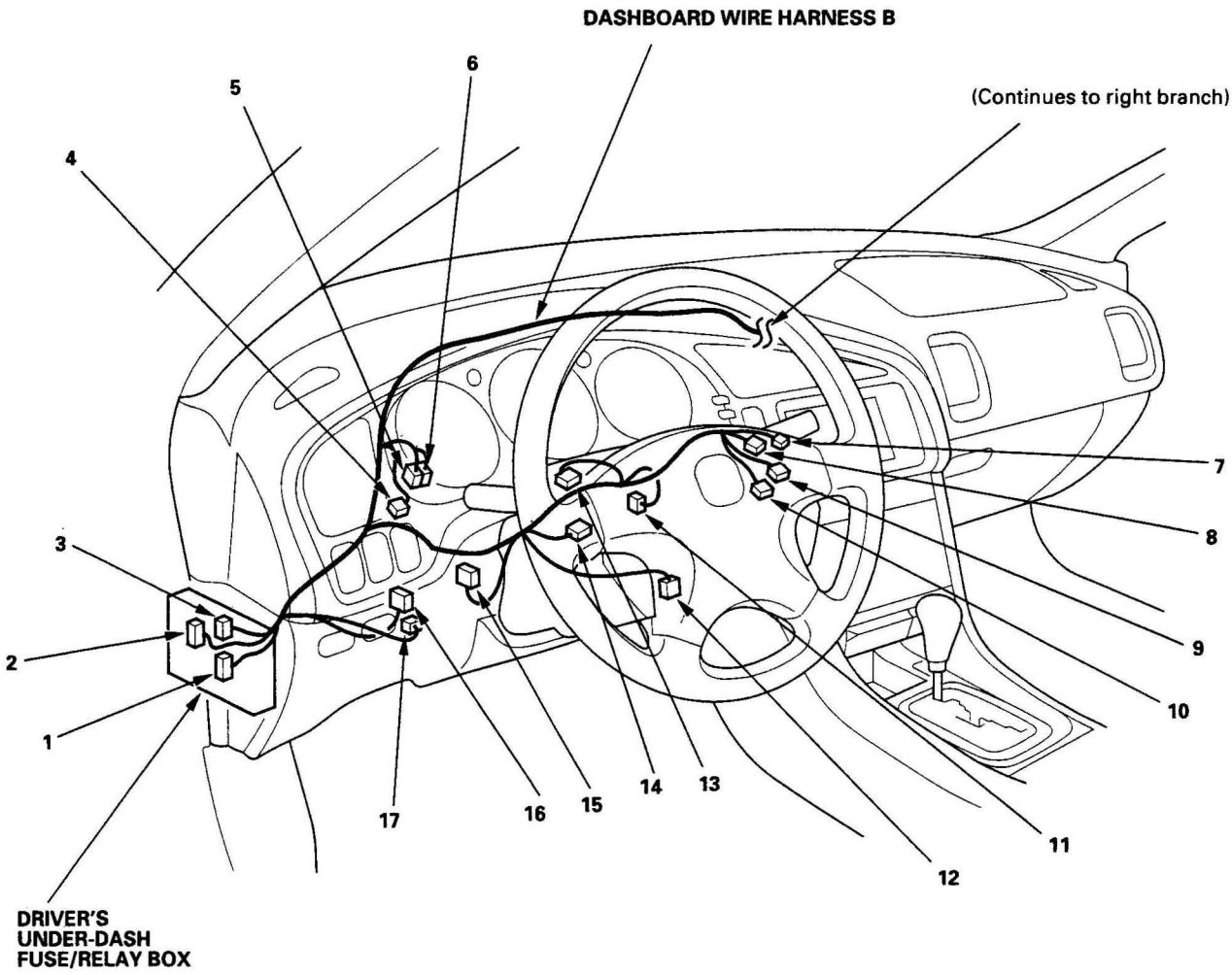
Connector to Harness Index (cont'd)

Dashboard Wire Harness B (Left branch) ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Brake pedal position switch	17	4	Under left side of dash		
Cable reel	14	4	Under left side of dash		
Combination light switch	13	14	In steering column cover		
Data link connector (DLC)	12	16	Under left side of dash		'03 model
Daytime running lights control unit	15	14	Under left side of dash		Canada
Driver's under-dash fuse/relay box connector O (see page 22-93)	1	20	Under left side of dash		
Driver's under-dash fuse/relay box connector P (see page 22-93)	3	7	Under left side of dash		
Driver's under-dash fuse/relay box connector Q (see page 22-93)	2	22	Under left side of dash		
Ignition key switch/key light	10	7	In steering column cover		
Immobilizer control unit-receiver	9	5	In steering column cover		
Intermittent dwell time controller	8	2	In steering column cover		
PGM-FI main relay	16	7	Under left side of dash		
Steering angle sensor	11	5	In steering column cover		TYPE S
Windshield wiper/washer switch	7	8	In steering column cover		
C302	5	20	Under left side of dash	Left engine compartment wire harness (see page 22-42)	
C304	6	10	Under left side of dash	Left engine compartment wire harness (see page 22-42)	
C401	4	18	Under left side of dash	Dashboard wire harness A (see page 22-56)	

BACK

Protected by AR



(cont'd)

Protected by AR

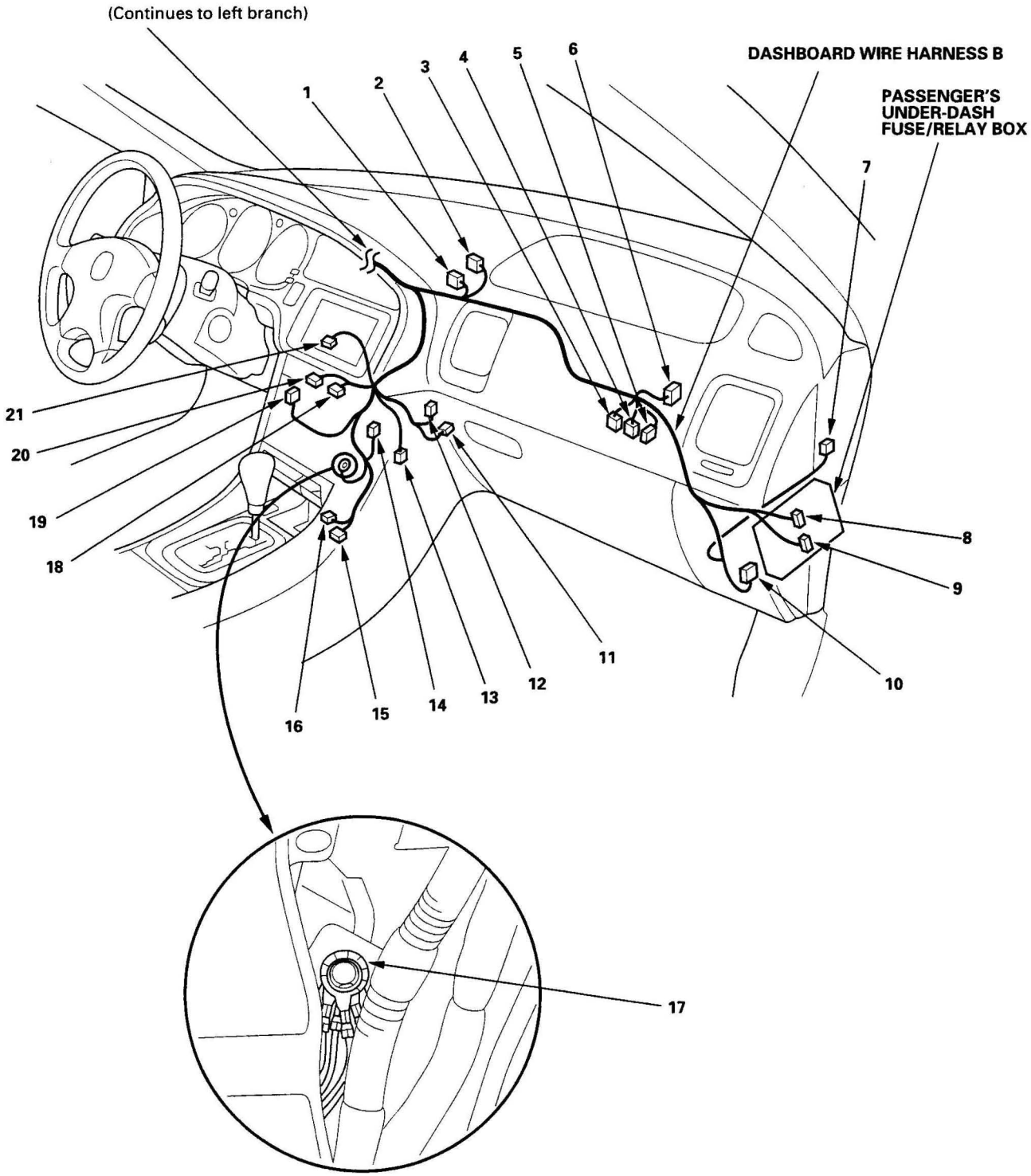
Connector to Harness Index (cont'd)

Dashboard Wire Harness B (Right branch) ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Air mix control motor	11	5	Under right side of dash		
Blower motor	10	2	Under right side of dash		
Climate control unit connector A	18	12	Under middle of dash		
Climate control unit connector B	20	20	Under middle of dash		
Data link connector (DLC)	15	16	Under right side of dash		'02 model
Evaporator temperature sensor	12	2	Under right side of dash		
Fan control module	14	8	Under right side of dash		
Mode control motor	19	10	Under left side of dash		
Navigation display unit connector A	21	5	Under middle of dash		
Passenger's under-dash fuse/relay box connector J (see page 22-94)	8	16	Behind right kick panel		
Passenger's under-dash fuse/relay box connector K (see page 22-94)	9	16	Behind right kick panel		
Power transistor	7	5	Behind right kick panel		
Recirculation control motor	6	5	Under right side of dash		
Trunk lid opener main switch	13	2	Under right side of dash		
C201	3	16	Under right side of dash	Right engine compartment wire harness (see page 22-34)	
C202	4	7	Under right side of dash	Right engine compartment wire harness (see page 22-34)	
C203	5	20	Under right side of dash	Right engine compartment wire harness (see page 22-34)	TYPE S
C203	5	12	Under right side of dash	Right engine compartment wire harness (see page 22-34)	PREMIUM
C402	1	16	Under right side of dash	Dashboard wire harness A (see page 22-56)	
C403	16	4	Under middle of dash	Front accessory power socket sub-harness (see page 22-86)	
C404	2	2	Under right side of dash	Dashboard wire harness A (see page 22-56)	'03 model
G401	17		Under middle of dash	Body ground via dashboard wire harness B	

BACK

Protected by AR



Protected by AR

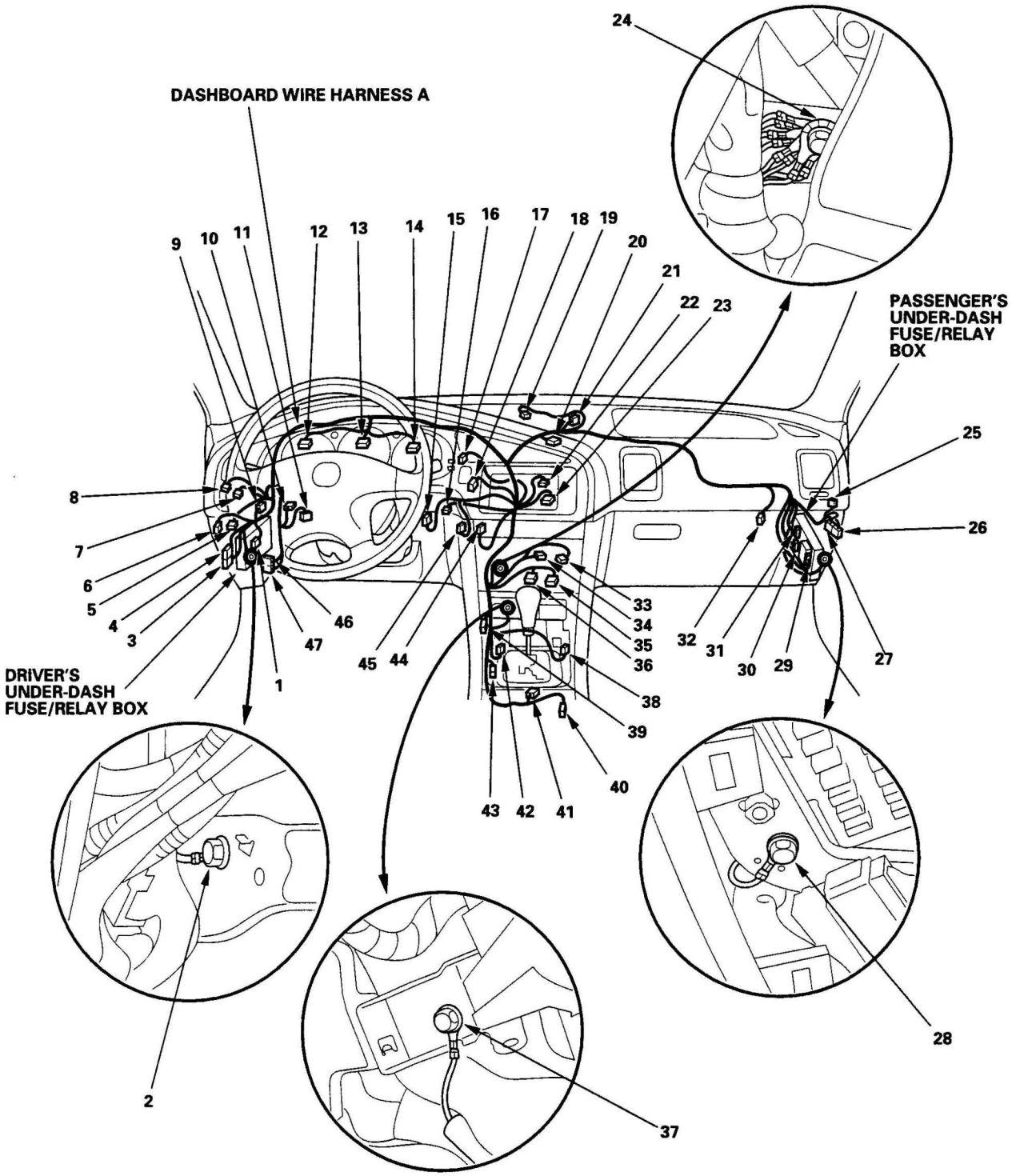
Connector to Harness Index (cont'd)

Dashboard Wire Harness A ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Audio unit connector A	35	12	Behind audio unit		
Audio unit connector B	36	20	Behind audio unit		
Clock	22	5	Behind middle of dash		
Cruise control unit	15	14	Behind left side of dash		
Cruise control main switch/TCS switch	7	8	Behind instrument panel		
Dash lights brightness controller	5	6	Behind instrument panel		
Driver's seat heater switch	42	6	Behind middle of dash		
Driver's under-dash fuse/relay box connector I (see page 22-93)	46	18	Behind left kick panel		
Driver's under-dash fuse/relay box connector K (see page 22-93)	47	18	Behind left kick panel		
Equalizer unit	44	14	Under middle of dash		
Gauge assembly connector A	12	30	Behind gauges		
Gauge assembly connector B	13	14	Behind gauges		
Gauge assembly connector C	14	18	Behind gauges		
Glove box light	32	2	Behind glove box		
Hazard warning switch	18	10	Behind middle of dash		
In-car temperature sensor	16	2	Behind middle of dash		
Moonroof switch	8	6	Behind instrument panel		
Mode switch	41	8	Middle of floor		'99 model
Mode switch	41	10	Middle of floor		'00-01 models
Multiplex control unit, driver's connector B	1	22	Behind left kick panel		
Multiplex control unit, passenger's connector B	29	22	Behind left kick panel		
Navigation display unit connector B	23	20	Behind display unit		
Passenger's seat heater switch	38	6	Behind middle of dash		
Passenger's under-dash fuse/relay box connector H (see page 22-94)	31	18	Behind left kick panel		
Passenger's under-dash fuse/relay box connector I (see page 22-94)	30	18	Behind left kick panel		
PCM connector A	33	32	Behind middle of dash		
PCM connector E	34	12	Behind middle of dash		'99 model
PCM connector E	34	20	Behind middle of dash		'00-01 models
Select/reset switch	17	5	Under middle of dash		
Sunlight sensor	19	2	Behind middle of dash		

BACK

Protected by AR



(cont'd)

Protected by AR

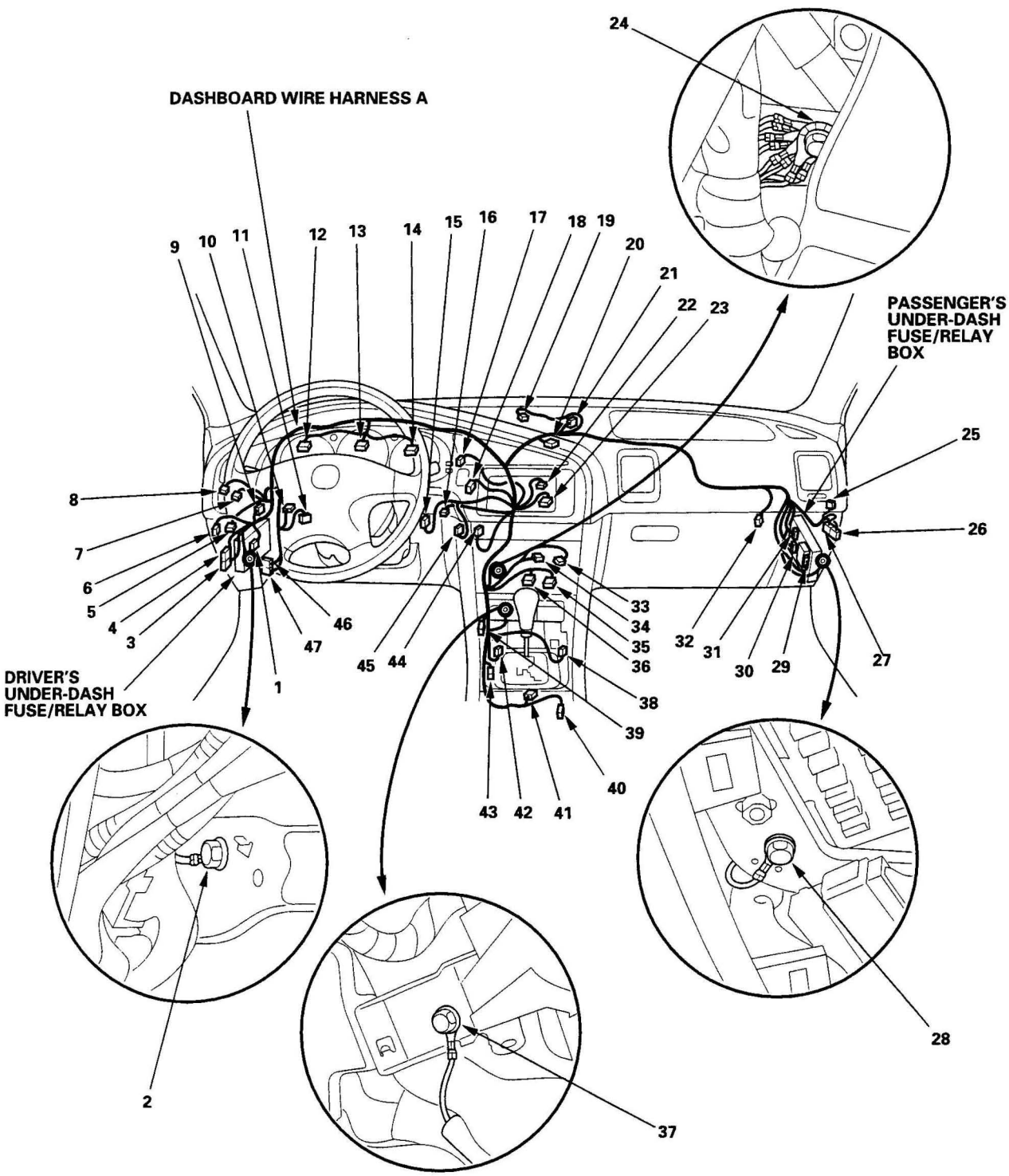
Connector to Harness Index (cont'd)

Dashboard Wire Harness A ('99-01 Models) (cont'd)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
C204	26	24	Behind right kick panel	Right engine compartment wire harness (see page 22-30)	
C301	11	18	Behind left side of dash	Left engine compartment wire harness (see page 22-38)	'99 model
C301	11	18	Behind left side of dash	Left engine compartment wire harness (see page 22-40)	'00-01 models
C401	10	14	Behind left side of dash	Dashboard wire harness B (see page 22-44)	
C402	21	14	Behind instrument panel	Dashboard wire harness B (see page 22-44)	
C451	43	2	Middle of floor between seats	Shift lock solenoid sub-harness (see page 22-71)	
C452 (Junction connector)	9	20	Behind left kick panel		
C453 (Junction connector)	20	20	Behind middle of dash		
C454 (Junction connector)	39	20	Behind middle of dash		
C501	27	10	Behind right kick panel	Right side wire harness (see page 22-66)	'99 model
C501	27	14	Behind right kick panel	Right side wire harness (see page 22-66)	'00-01 models
C551	4	18	Behind left kick panel	Left side wire harness (see page 22-62)	
C552	3	20	Behind left kick panel	Left side wire harness (see page 22-62)	Navigation
C601	6	7	Behind left kick panel	Moonroof wire harness (see page 22-71)	
C651	25	2	Behind right kick panel	Roof wire harness (see page 22-71)	
C801	45	3	Behind middle of dash	SRS main harness (see page 22-87)	'99 model
C801	45	8	Behind middle of dash	SRS main harness (see page 22-88)	'00-01 models
C851	40	3	Middle of floor between seats	Rear accessory power socket sub-harness (see page 22-86)	
G501	24		Under middle of dash	Body ground via dashboard wire harness A	
G502	37		Under middle of dash	Body ground via dashboard wire harness A	
G503	2		Behind left kick panel	Body ground via dashboard wire harness A	
G504	28		Behind right kick panel	Body ground via dashboard wire harness A	

BACK

Protected by AR



Protected by AR

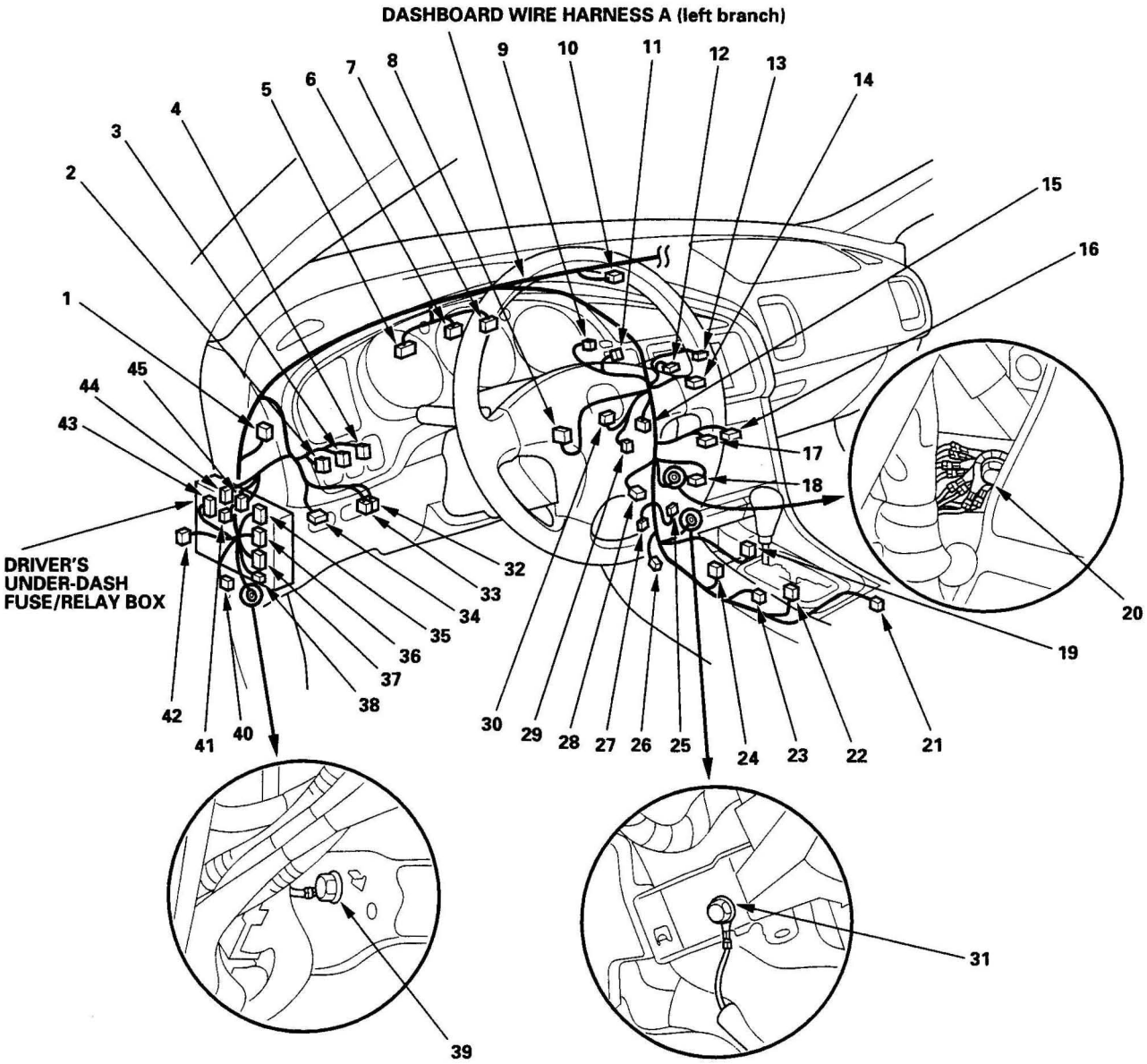
Connector to Harness Index (cont'd)

Dashboard Wire Harness A (Left branch) ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Audio unit connector A	16	12	Behind audio unit		
Audio unit connector B	17	20	Behind audio unit		
Clock	12	5	Behind clock		
Cruise control unit	8	14	Under middle of dash		
Cruise/TCS/VSA switch	3	8	Under left side of dash		
Dash lights brightness controller	34	6	Under left side of dash		
Driver's seat heater switch	24	6	Behind console panel		
Driver's under-dash fuse/relay box connector I (see page 22-93)	44	18	Under left side of dash		
Driver's under-dash fuse/relay box connector K (see page 22-93)	45	18	Under left side of dash		
Equalizer unit	30	14	Under middle of dash		
Fog light switch	2	5	Behind left side of dash		
Gauge assembly connector A	5	30	Behind gauge assembly		
Gauge assembly connector B	6	14	Behind gauge assembly		
Gauge assembly connector C	7	18	Behind gauge assembly		
Hazard warning switch	11	10	Behind middle of dash		Navigation
Hazard warning switch	13	10	Behind middle of dash		
In-car temperature sensor	29	2	Behind middle of dash		
Lateral acceleration (Lg) sensor	25	3	Under middle of dash		TYPE S
Memory erase signal (MES) connector	41	2	In driver's fuse/relay box		
Moonroof switch	4	6	Behind left side of dash		
Mode switch	22	10	Middle of floor		
Multiplex control unit, driver's connector B	43	22	Under left side of dash		
Navigation display unit connector B	14	20	Behind navigation display		
Passenger's seat heater switch	19	6	Behind console panel		
PCM connector A	18	32	Under middle of dash		
PCM connector E	28	20	Under middle of dash		
Select/reset switch	9	5	Right side of gauge assembly		
SRS unit connector C	27	8	Under middle of dash		

BACK

Protected by AR



(cont'd)

BACK

Protected by AR

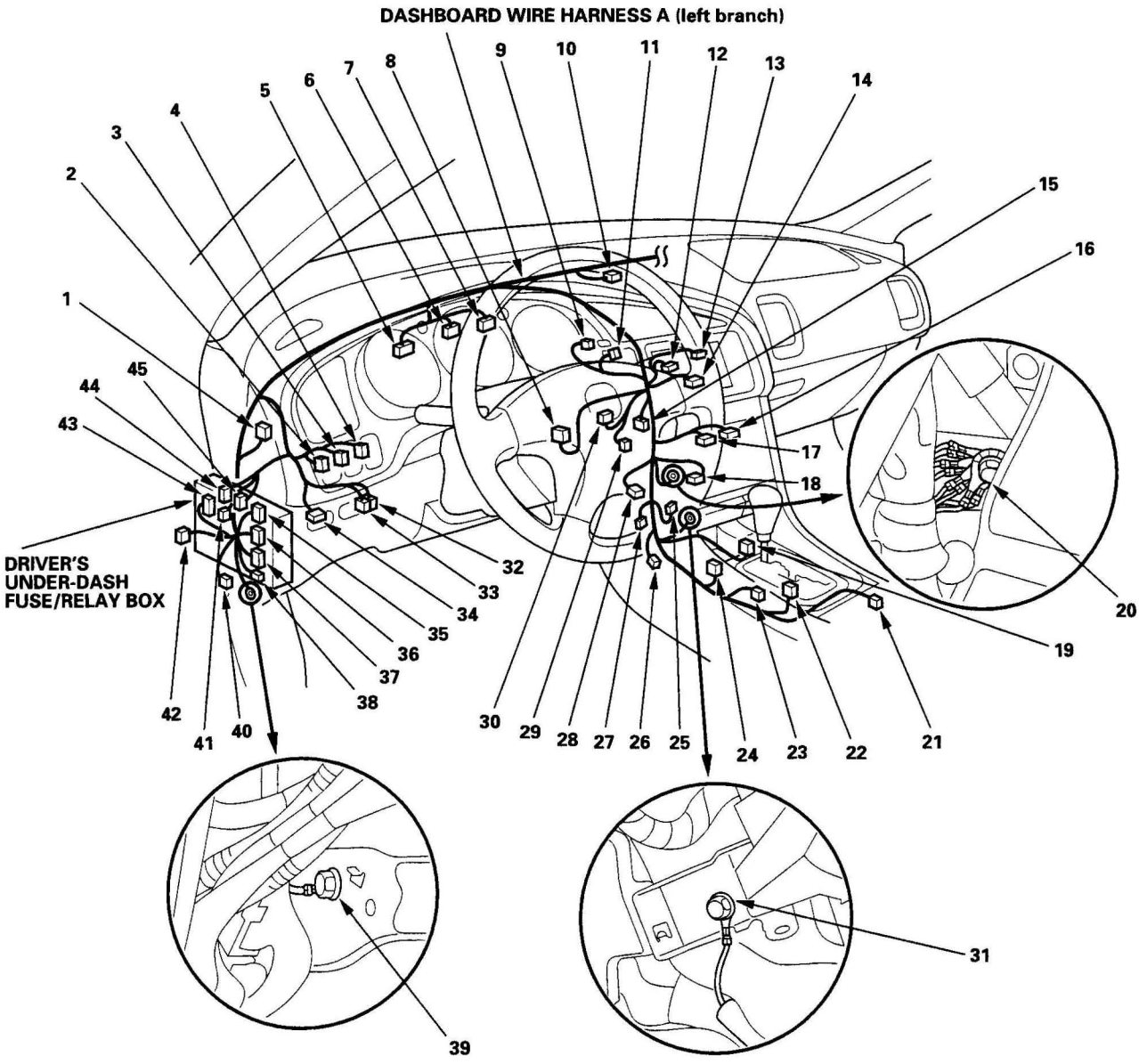
Connector to Harness Index (cont'd)

Dashboard Wire Harness A (Left branch) ('02-03 Models) (cont'd)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
C301	33	16	Under left side of dash	Left engine compartment wire harness (see page 22-42)	
C401	32	18	Under left side of dash	Dashboard wire harness B (see page 22-48)	
C451	23	2	Under console panel	Shift lock solenoid sub-harness (see page 22-71)	
C452 (Junction connector)	1	20	Behind left side of dash		
C453 (Junction connector)	10	20	Under middle of dash		
C454 (Junction connector)	26	20	Under middle of dash		
C551	36	22	Under left side of dash	Left side wire harness (see page 22-64)	
C552	37	24	Under left side of dash	Left side wire harness (see page 22-64)	Navigation
C552	37	13	Under left side of dash	Left side wire harness (see page 22-64)	'02 model
C552	37	6	Under left side of dash	Left side wire harness (see page 22-64)	'03 model
C556	38	4	Under left side of dash	Left side wire harness (see page 22-64)	
C557	42	20	Under left side of dash	Driver's door wire harness (see page 22-73)	
C559	40	6	Under left side of dash	Left side wire harness (see page 22-64)	'03 model, Navigation
C601	35	7	Under left side of dash	Moonroof wire harness (see page 22-71)	
C801	15	4	Under middle of dash	SRS main harness (see page 22-90)	
C851	21	3	Behind rear console	Rear accessory power socket sub-harness (see page 22-86)	
G501	20		Under middle of dash	Body ground, via dashboard wire harness A	
G502	31		Under middle of dash	Body ground, via dashboard wire harness A	
G503	39		Under left side of dash	Body ground, via dashboard wire harness A	

BACK

Protected by AR



(cont'd)

Protected by AR

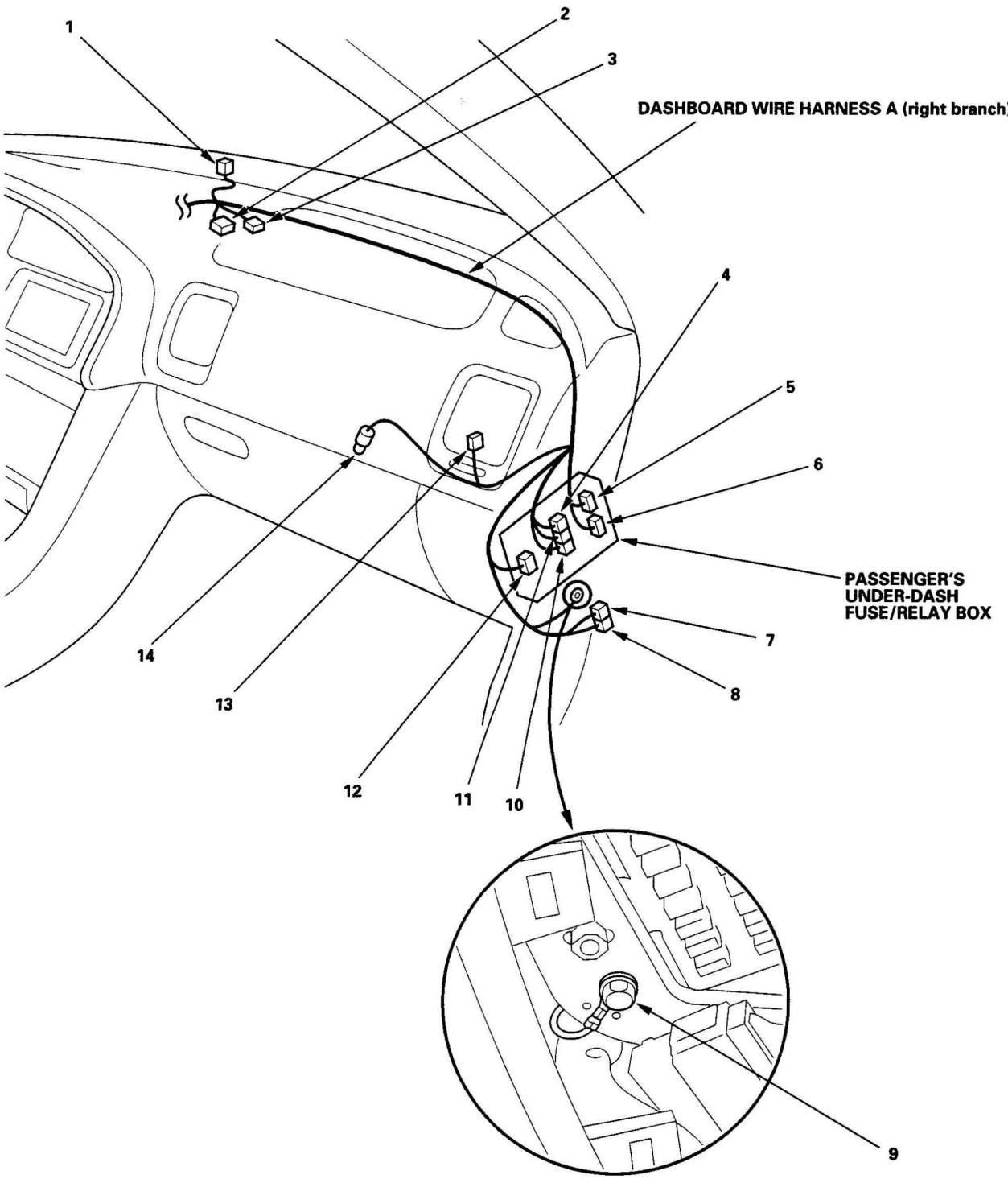
Connector to Harness Index (cont'd)

Dashboard Wire Harness A (Right branch) ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Glove box light	14	2	Behind glove box		
Keyless receiver unit	13	7	Under right side of dash		
Multiplex control unit, passenger's connector B	12	22	Under right side of dash		
Passenger's under-dash fuse/relay box connector H (see page 22-94)	6	18	Under right side of dash		
Passenger's under-dash fuse/relay box connector I (see page 22-94)	5	18	Under right side of dash		
Sunlight sensor	1	2	Middle of dash		
C204	7	24	Under right side of dash	Right engine compartment wire harness (see page 22-34)	
C402	2	16	Under middle of dash	Dashboard wire harness B (see page 22-48)	
C404	3	2	Under middle of dash	Dashboard wire harness B (see page 22-48)	'03 model
C501	11	20	Under right side of dash	Right side wire harness (see page 22-68)	
C502	10	4	Under right side of dash	Right side wire harness (see page 22-68)	
C558	8	13	Under right side of dash	Passenger's door wire harness (see page 22-75)	
C651	4	2	Under right side of dash	Roof wire harness (see page 22-71)	
G504	9		Behind right side dashboard cover	Body ground, via dashboard wire harness A	

BACK

Protected by AR



BACK

Protected by AR

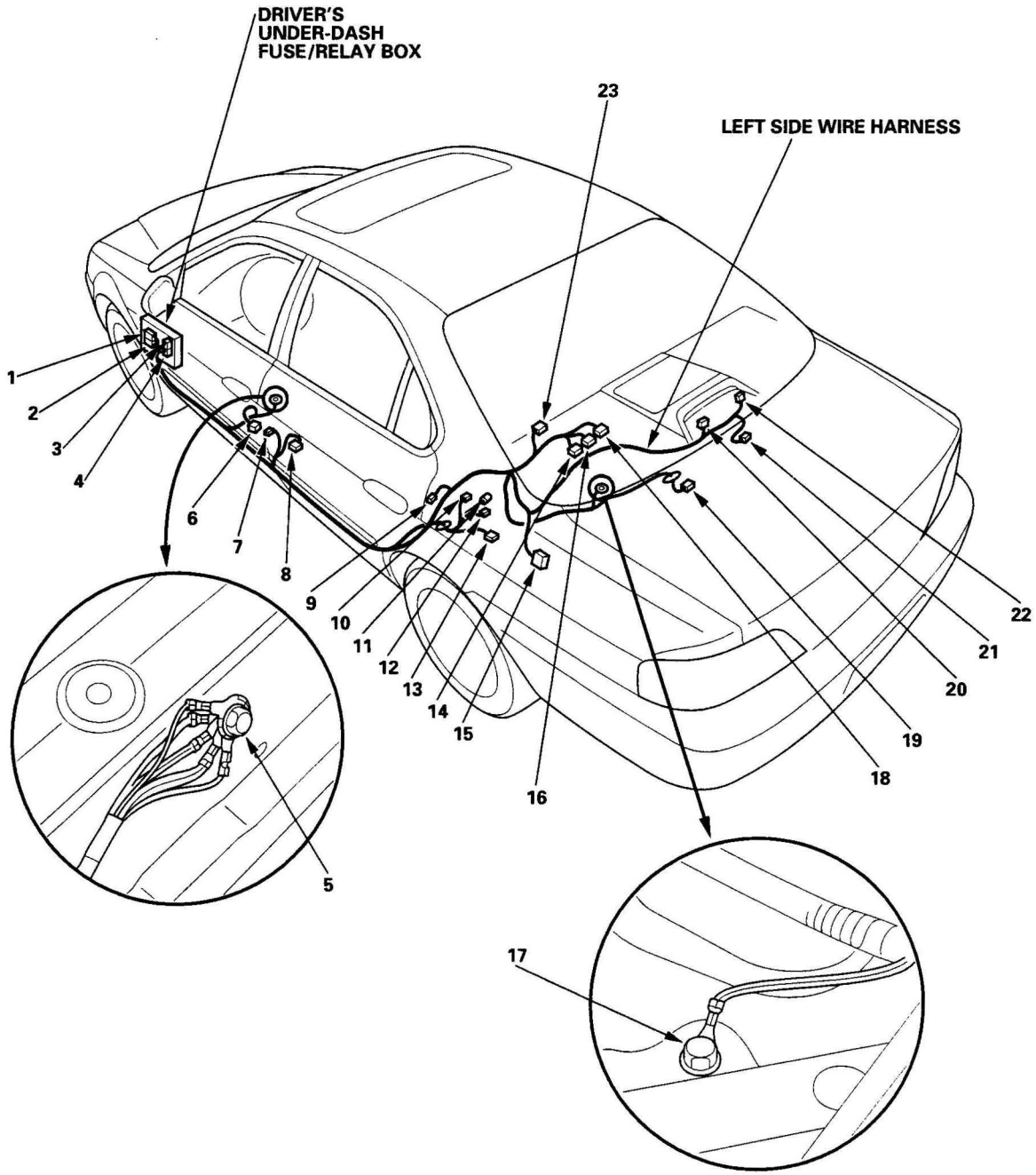
Connector to Harness Index (cont'd)

Left Side Wire Harness ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS left rear wheel sensor	13	2	Left side of trunk		
Driver's door switch	7	1	Left B-pillar		
Driver's under-dash fuse/relay box connector A (see page 22-93)	3	10	Left side of kick panel		
Driver's under-dash fuse/relay box connector B (see page 22-93)	4	14	Left side of kick panel		
EVAP bypass solenoid valve	12	2	Left side of trunk		
EVAP control canister vent shut valve	10	2	Left side of trunk		
EVAP fuel tank pressure switch	11	3	Left side of trunk		
Fuel pump /fuel gauge sending unit	19	5	Fuel tank		
High mount brake light connector A	20	2	Middle of rear shelf		
High mount brake light connector B	22	2	Middle of rear shelf		
Left rear door switch	9	1	Left quarter panel		
Navigation service check connector	23	2	Left side of trunk		
Navigation unit connector A	16	12	Left side of trunk		
Navigation unit connector B	14	16	Left side of trunk		
Navigation unit connector C	18	8	Left side of trunk		
Trunk light	21	2	Middle of rear shelf		
C551	1	18	Left side of kick panel	Dashboard wire harness A	
C552	2	20	Left side of kick panel	Dashboard wire harness A	Navigation
C553	6	10	Under driver's seat	Driver's seat wire harness (see page 22-78)	'99 model
C553	6	10	Under driver's seat	Driver's seat wire harness (see page 22-79)	'00-01 models
C554	8	10	Left B-pillar	Left rear door wire harness (see page 22-76)	
C555	15	10	Left side of trunk	Rear wire harness (see page 22-70)	
G551	5		Under driver's seat	Body ground via left side wire harness	
G552	17		Left side of trunk	Body ground via left side wire harness	

BACK

Protected by AR



Protected by AR

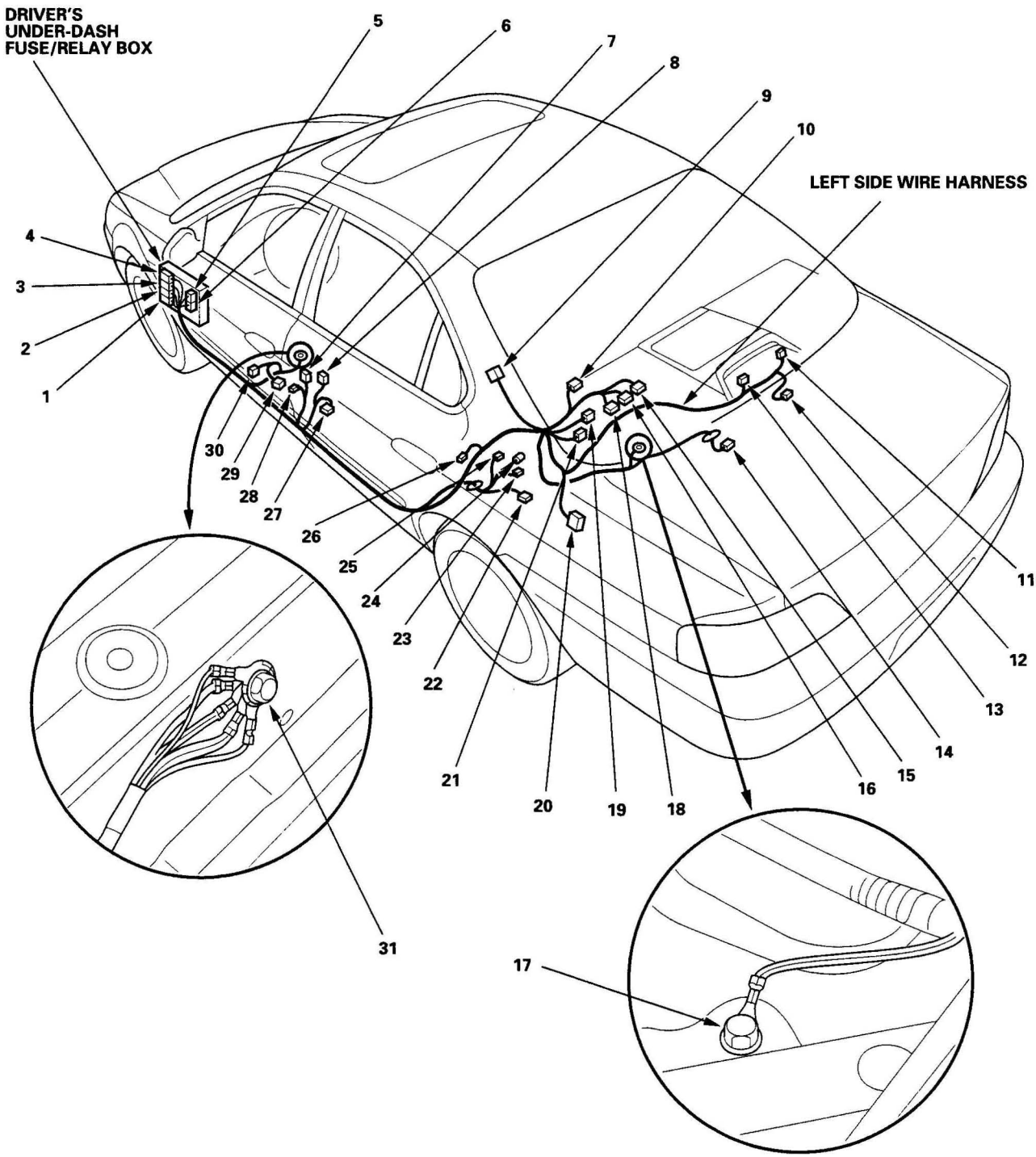
Connector to Harness Index (cont'd)

Left Side Wire Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS left rear wheel sensor	22	2	Left side of trunk		
Driver's door switch	28	1	Left B-pillar		
Driver's seat belt tensioner	7	2	Left B-pillar		
Driver's seat belt tension reducer solenoid	8	2	Left B-pillar		
Driver's under-dash fuse/relay box connector A (see page 22-93)	5	10	Under left side of dash		
Driver's under-dash fuse/relay box connector B (see page 22-93)	6	14	Under left side of dash		
EVAP bypass solenoid valve	25	2	Left side of trunk		
EVAP control canister vent shut valve	23	2	Left side of trunk		
EVAP fuel tank pressure switch	24	3	Left side of trunk		
Fuel pump/fuel gauge sending unit	14	5	Fuel tank		
High mount brake light connector A	11	2	Middle of rear shelf		
High mount brake light connector B	13	2	Middle of rear shelf		
Left rear door switch	26	1	Left quarter panel		
Navigation service check connector	10	2	Left side of trunk		
Navigation unit connector A	15	12	Left side of trunk		
Navigation unit connector B	16	16	Left side of trunk		
Navigation unit connector C	18	8	Left side of trunk		
Trunk light	12	2	Middle of rear shelf		
C551	4	22	Under left side of dash	Dashboard wire harness A (see page 22-56)	
C552	3	24	Under left side of dash	Dashboard wire harness A (see page 22-56)	Navigation
C552	3	13	Under left side of dash	Dashboard wire harness A (see page 22-56)	'02 model
C552	3	6	Under left side of dash	Dashboard wire harness A '03 model (see page 22-56)	'03 model
C553	29	24	Under driver's seat	Driver's seat wire harness (see page 22-80)	'02 model
C553	29	22	Under driver's seat	Driver's seat wire harness (see page 22-80)	'03 model
C554	27	10	Left B-pillar	Left rear door wire harness (see page 22-76)	
C555	20	10	Left side of trunk	Rear wire harness (see page 22-70)	
C556	2	4	Under left side of dash	Dashboard wire harness A (see page 22-56)	
C559	1	6	Under left side of dash	Dashboard wire harness A (see page 22-56)	'03 model, Navigation
C560	30	1	Under driver's seat	SRS floor harness (see page 22-90)	'03 model, Navigation
C561	19	6	Left side of trunk	OnStar system subharness (see page 22-70)	'03 model, Navigation
C562	21	21	Left side of trunk	OnStar system subharness (see page 22-70)	'03 model, Navigation
C563	9	8	Left C-pillar	Moonroof wire harness (see page 22-71)	'03 model, Navigation
G551	31		Under driver's seat	Body ground, via left side wire harness	
G552	17		Left side of trunk	Body ground, via left side wire harness	

BACK

Protected by AR



BACK

Protected by AR

Connector to Harness Index (cont'd)

Right Side Wire Harness ('99-01 Models)

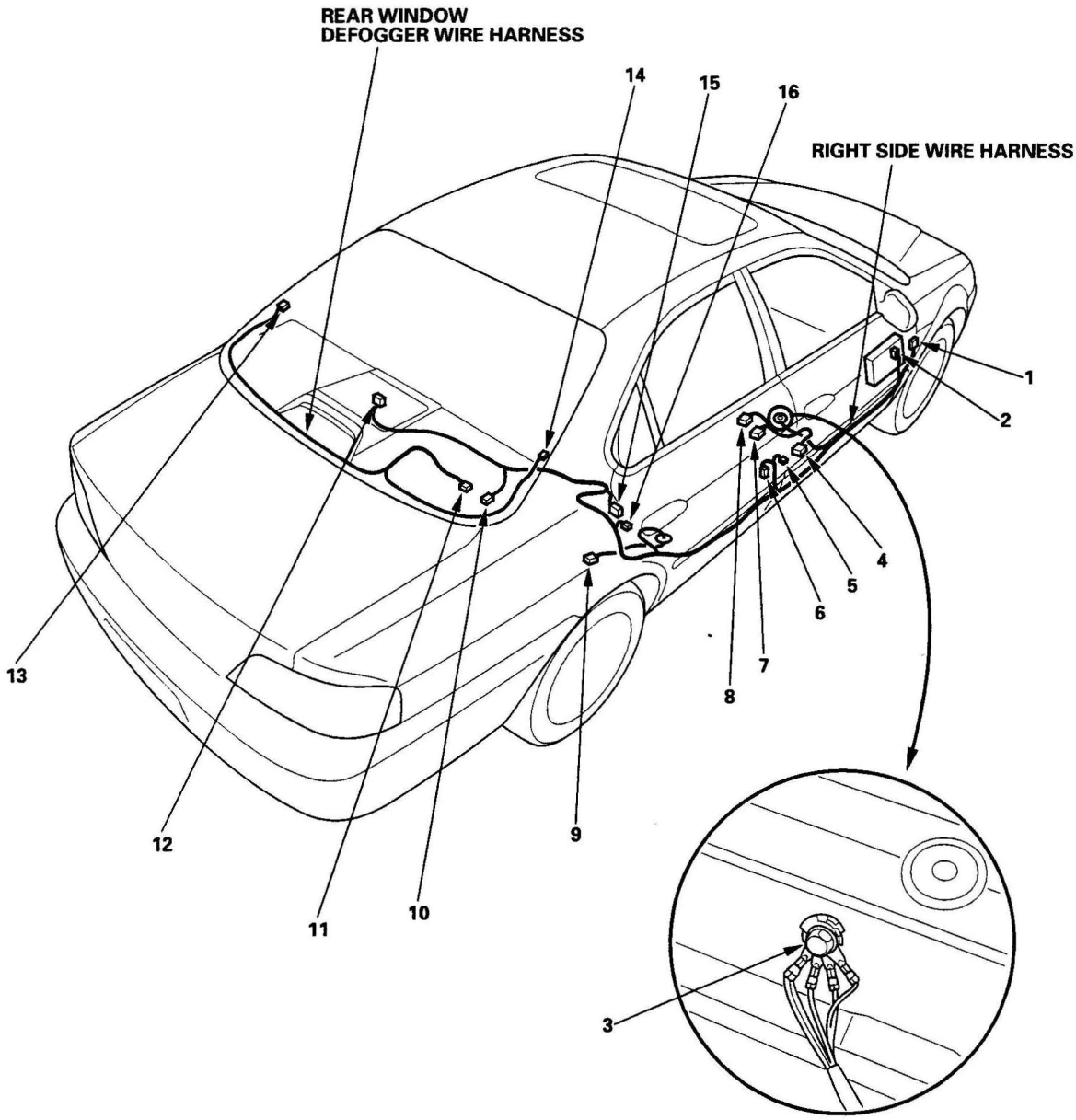
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS right rear wheel sensor	9	2	Under right side of rear seat		
OPDS unit	7	4	Under passenger's seat		'00-01 models
Passenger's door switch	5	1	Right B-pillar		
Passenger's under-dash fuse/relay box connector A (see page 22-94)	2	20	Behind right kick panel		
Right rear door switch	16	1	Right quarter panel		
Stereo amplifier	15	12	Right quarter panel		
Window antenna coil connector A	10	1	Middle of rear shelf		
Woofer speaker	12	5	Middle of rear shelf		
C501	1	10	Behind right kick panel	Dashboard wire harness A (see page 22-52)	'99 model
C501	1	14	Behind right kick panel	Dashboard wire harness A (see page 22-52)	'00-01 models
C581	4	8	Under passenger's seat	Passenger's seat wire harness (see page 22-81)	'99 model
C581	4	10	Under passenger's seat	Passenger's seat wire harness (see page 22-82)	'00-01 models
C582	6	10	Right B-pillar	Right rear door wire harness (see page 22-77)	
C583	8	1	Under passenger's seat	SRS floor harness (see page 22-88)	'00-01 models
G581	3		Under passenger's seat	Body ground via right side wire harness	

Rear Window Defogger Wire Harness ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Rear window defogger connector A (+)	14	1	Right C-pillar		
Rear window defogger connector B (−)	13	1	Left C-pillar		
Window antenna coil connector B	11	2	Middle of rear shelf		

BACK

Protected by AR



BACK

Protected by AR

Connector to Harness Index (cont'd)

Right Side Wire Harness ('02-03 Models)

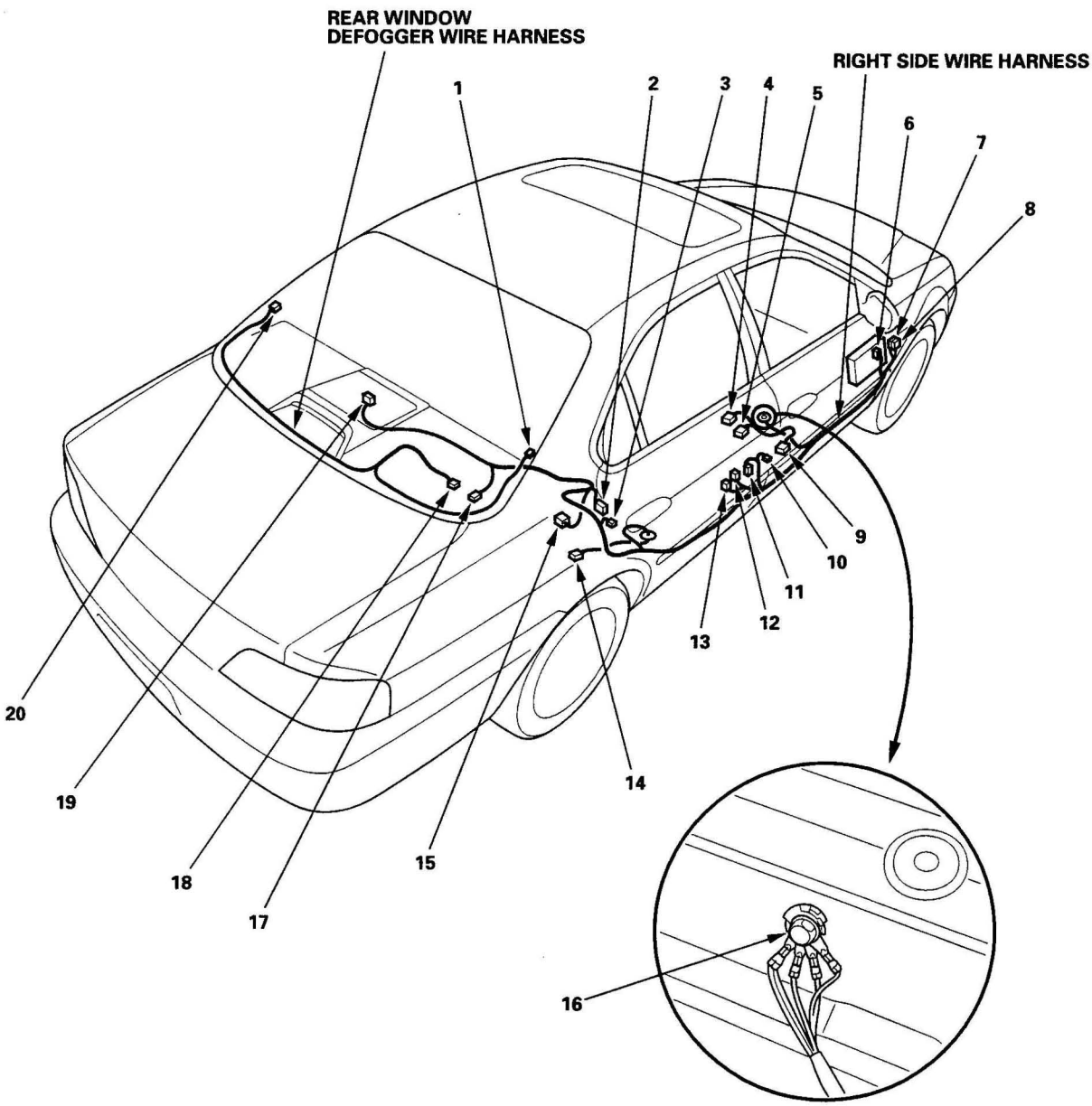
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS right rear wheel sensor	14	2	Under right side of rear seat		
Front passenger's door switch	10	1	Right B-pillar		
Front passenger's side seat belt tensioner	12	2	Right B-pillar		
Front passenger's side seat belt tension reducer	13	2	Right B-pillar		
OPDS unit connector	4	4	Under passenger's seat		
Passenger's under-dash fuse/relay box connector A (see page 22-94)	6	20	Behind right kick panel		
Right rear door switch	3	1	Right quarter panel		
Stereo amplifier	2	12	Right quarter panel		
Window antenna coil connector A	17	1	Middle of rear shelf		
Woofer speaker	19	5	Middle of rear shelf		
Yaw rate sensor	15	4	Behind right rear quarter trim		
C501	7	20	Behind right kick panel	Dashboard wire harness A (see page 22-56)	
C502	8	4	Behind right kick panel	Dashboard wire harness A (see page 22-56)	
C581	9	10	Under passenger's seat	Passenger's seat wire harness (see page 22-83)	
C582	11	10	Right B-pillar	Right rear door wire harness (see page 22-77)	
C583	5	1	Under passenger's seat	SRS floor harness (see page 22-90)	
G581	16		Under passenger's seat	Body ground via right side wire harness	

Rear Window Defogger Wire Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Rear window defogger connector A (+)	1	1	Right C-pillar		
Rear window defogger connector B (−)	20	1	Left C-pillar		
Window antenna coil connector B	18	2	Middle of rear shelf		

BACK

Protected by AR



Protected by AR

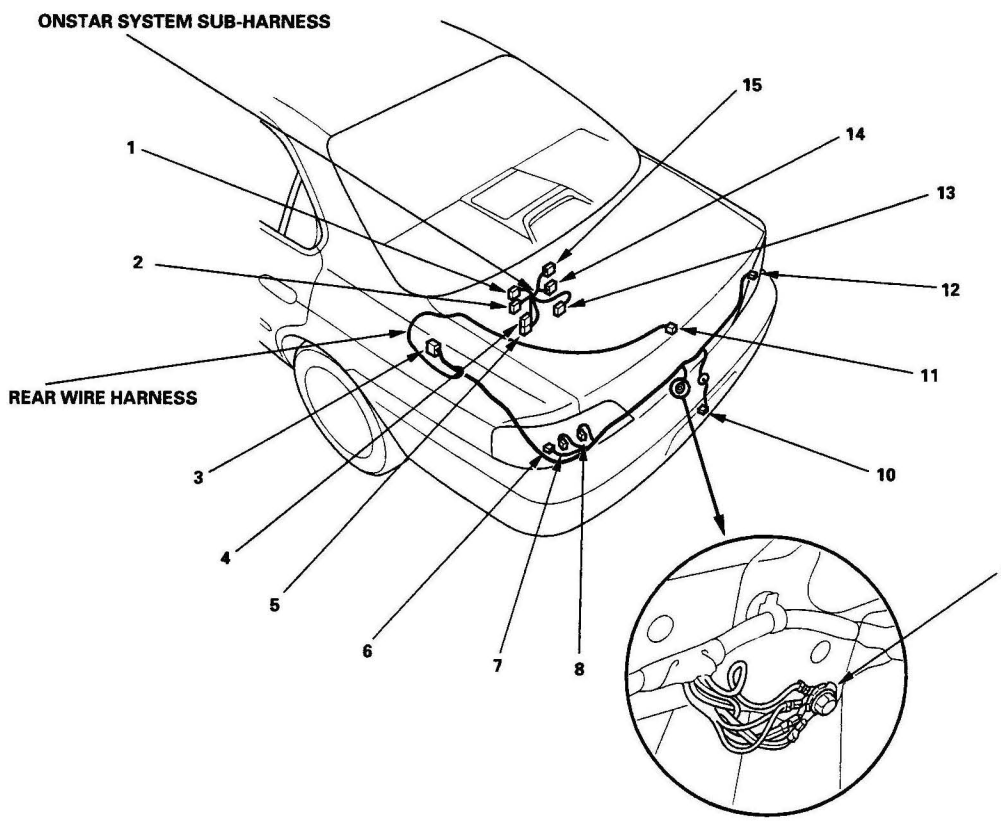
Connector to Harness Index (cont'd)

Rear Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Brake light failure sensor	8	6	Left side of trunk		
Left taillight	7	8	Left side of trunk		
License plate lights	10	2	Right side of trunk		
Right taillight	12	8	Right side of trunk		
Trailer lighting connector	6	6	Left side of trunk		
Trunk lid latch switch and opener solenoid	11	6	Left side of trunk		
C555	3	10	Left side of trunk	Left side wire harness (see page 22-62)	'99-01 models
C555	3	10	Left side of trunk	Left side harness (see page 22-64)	'02-03 models
G601	9		Middle of trunk	Body ground via rear wire harness	

OnStar System Subharness (03 Model: With Navigation)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
OnStar control unit connector A	15	32	Left side of trunk		
OnStar control unit connector B	14	32	Left side of trunk		
OnStar system interface unit connector A	4	12	Left side of trunk		
OnStar system interface unit connector B	5	16	Left side of trunk		
OnStar system radio frequency modulator unit	13	25	Left side of trunk		
C561	1	6	Left side of trunk	Left side wire harness (see page 22-64)	
C562	2	21	Left side of trunk	Left side wire harness (see page 22-64)	



BACK

Protected by AR

Roof Wire Harness

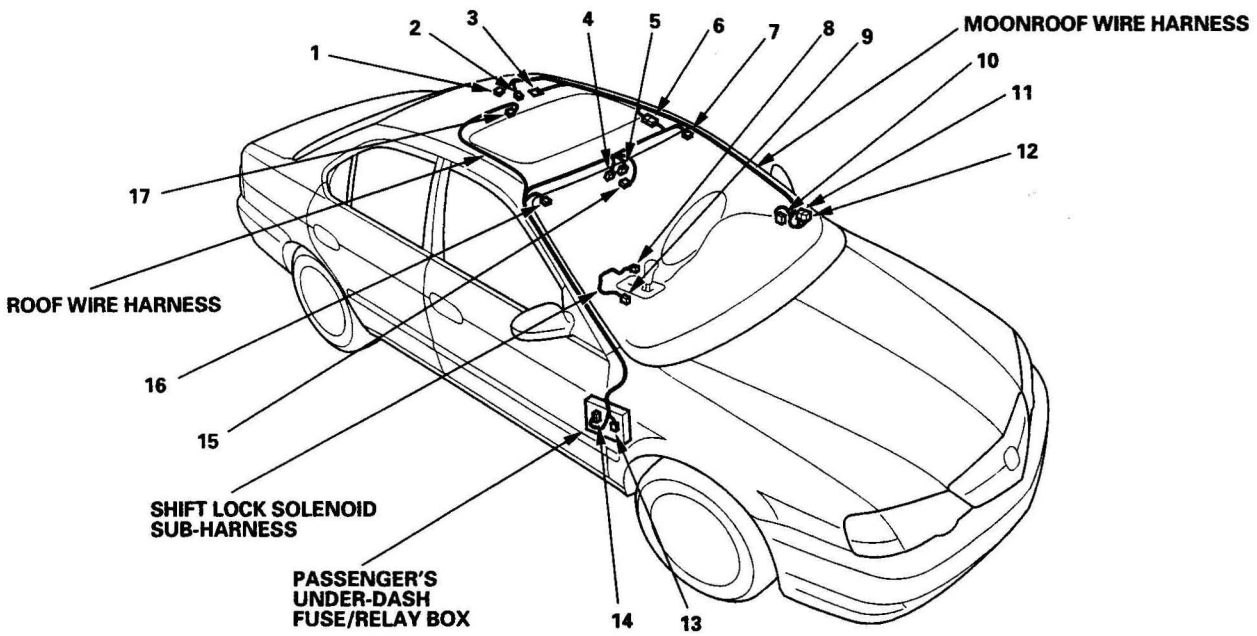
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Automatic dimming mirror	4	3	Roof		
Ceiling light	17	3	Roof		
Driver's vanity mirror light	7	2	Roof		
Onstar switches and microphone/ automatic dimming inside mirror	15	16	Rear view mirror		'03 model, Navigation
Passenger's under-dash fuse/relay box connector B (see page 22-94)	14	4	Under right side of dash		
Passenger's vanity mirror light	16	2	Roof		
Spotlights	5	3	Roof		
C651	13	2	Under right side of dash	Dashboard wire harness A (see page 22-52)	'99-01 models
C651	13	2	Under right side of dash	Dashboard wire harness A (see page 22-52)	'02-03 models
C652	6	8	Roof	Moonroof wire harness	'03 model, Navigation

Moonroof Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Moonroof close relay	12	5	Behind left kick panel		
Moonroof motor	2	2	Roof		
Moonroof open relay	11	5	Behind left kick panel		
Moonroof position switch	1	4	Roof		
C563	3	8	Left C-pillar	Left side wire harness (see page 22-64)	'03 model, Navigation
C601	10	7	Behind left kick panel	Dashboard wire harness A (see page 22-52)	'99-01 models
C601	10	7	Behind left kick panel	Dashboard wire harness A (see page 22-56)	'02-03 models
C652	6	8	Roof	Roof wire harness	'03 model, Navigation

Shift Lock Solenoid Sub-harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Shift lock solenoid	9	2	Middle of floor between seats		
C451	8	2	Middle of floor between seats	Dashboard wire harness A (see page 22-56)	



Protected by AR

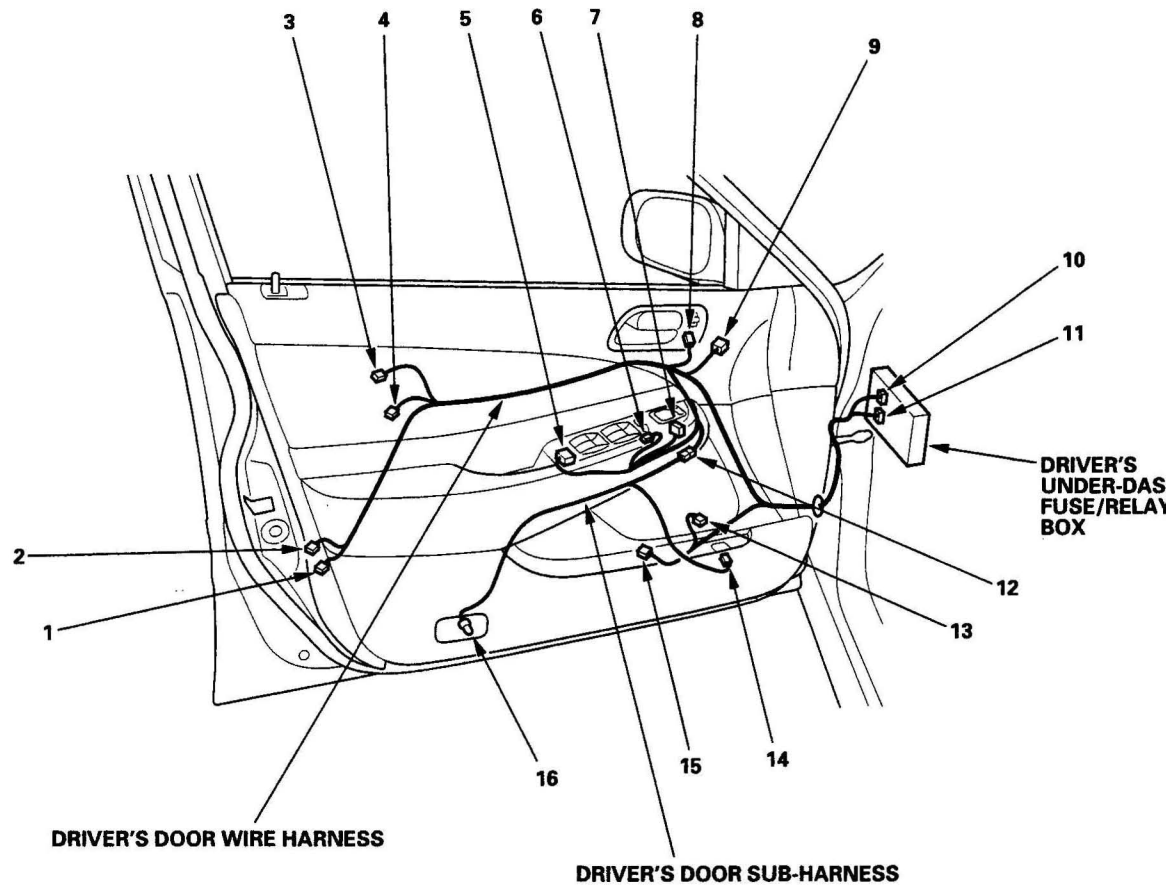
Connector to Harness Index (cont'd)

Driver's Door Wire Harness ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's door key cylinder switch	4	3	Driver's door		
Driver's door lock actuator	1	2	Driver's door		
Driver's door lock knob switch	2	3	Driver's door		
Driver's door lock switch	8	3	Driver's door		
Driver's door speaker	13	2	Driver's door		
Driver's power window motor	15	4	Driver's door		
Driver's under-dash fuse/relay box connector F (see page 22-93)	10	6	Behind left kick panel		
Driver's under-dash fuse/relay box connector G (see page 22-93)	11	18	Behind left kick panel		
Left power mirror actuator	9	6	Driver's door		
Multiplex control unit, door connector B	6	2	Driver's door		
Multiplex control unit, door connector A	5	20	Driver's door		
Power mirror switch	7	10	Driver's door		
Security indicator	3	2	Driver's door		
C631	12	4	Driver's door	Driver's door sub-harness	

Driver's Door Sub-harness ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's door courtesy light	16	2	Driver's door		
Trunk lid opener switch	14	2	Driver's door		
C631	12	4	Driver's door	Driver's door wire harness	



BACK

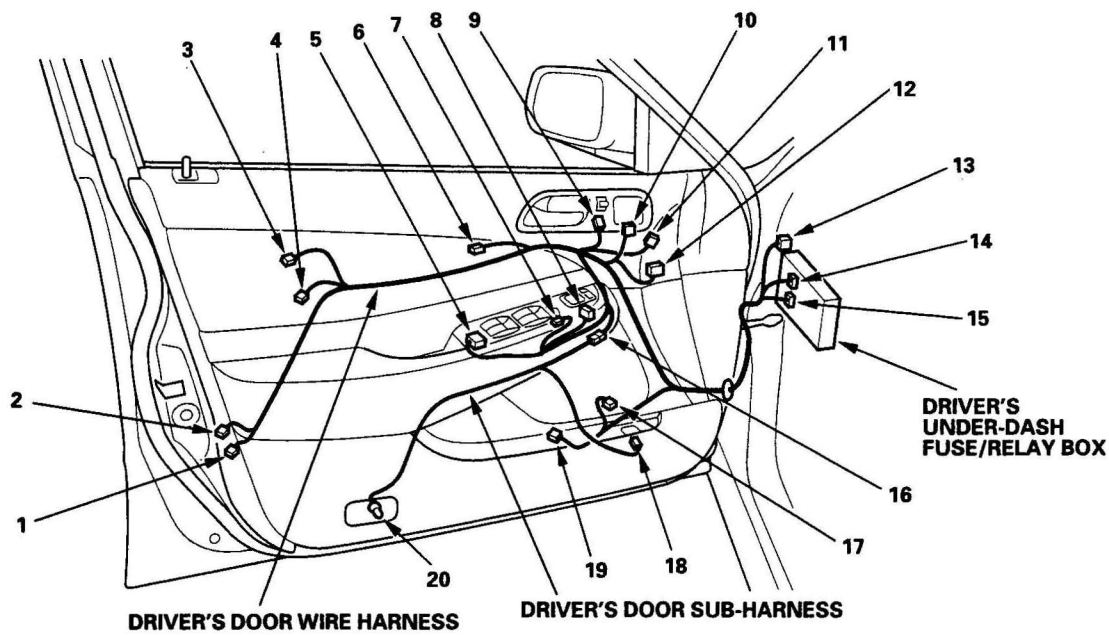
Protected by AR

Driver's Door Wire Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's door key cylinder switch	4	3	Driver's door		
Driver's door lock actuator	1	2	Driver's door		
Driver's door lock knob switch	2	3	Driver's door		
Driver's door lock switch	9	3	Driver's door		
Driver's door speaker	17	2	Driver's door		
Driver's power window motor	19	6	Driver's door		
Driver's under-dash fuse/relay box connector F (see page 22-93)	14	6	Under left side of dash		
Driver's under-dash fuse/relay box connector G (see page 22-93)	15	18	Under left side of dash		
Driving position memory switch	10	10	Driver's door		
Left power mirror actuator	11	13	Driver's door		
Multiplex control unit, door connector A	5	20	Driver's door		
Multiplex control unit, door connector B	7	2	Driver's door		
Power mirror switch	8	13	Driver's door		
Power window control unit	12	18	Driver's door		
Security indicator	3	2	Driver's door		
C557	13	20	Under left side of dash	Dashboard wire harness A (see page 22-56)	
C631	16	6	Driver's door	Driver's door sub-harness	
C632 (Junction connector)	6	20	Driver's door		'03 model

Driver's Door Sub-harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's door courtesy light	20	2	Driver's door		
Trunk opener switch	18	2	Driver's door		
C631	16	6	Driver's door	Driver's door wire harness	



Protected by AR

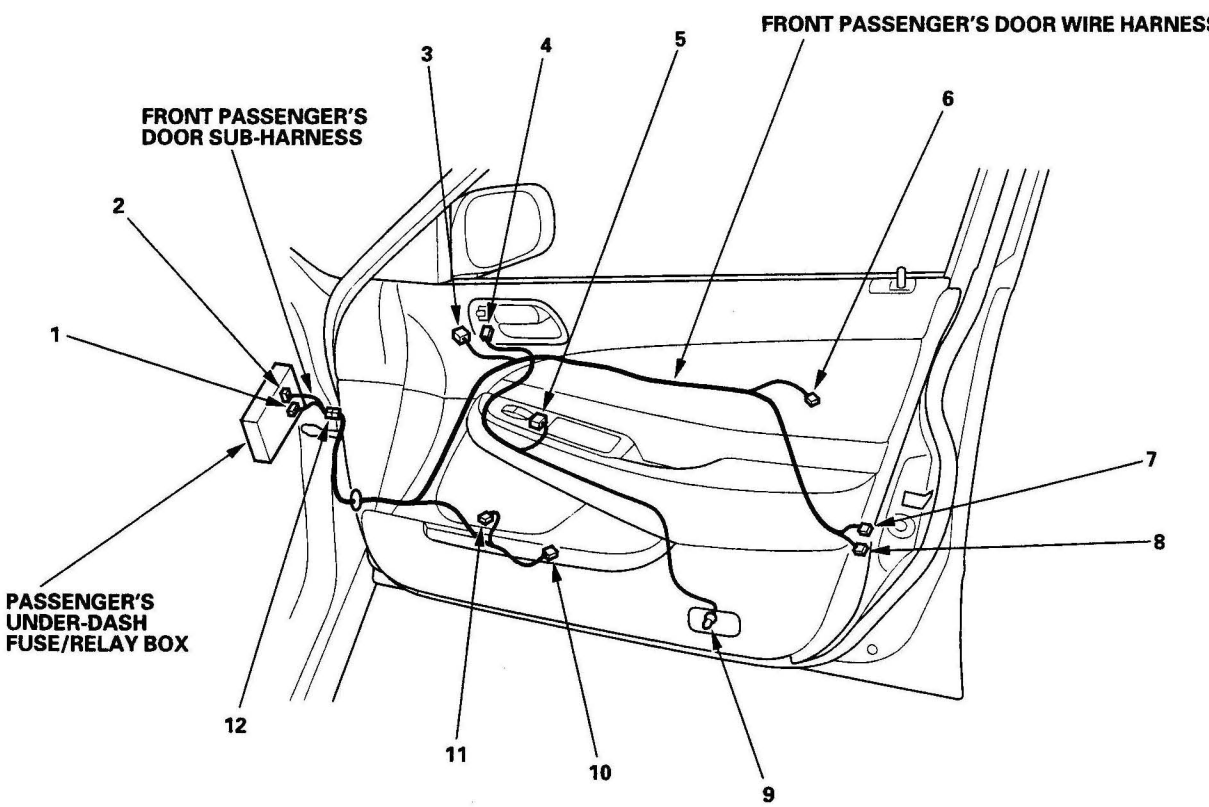
Connector to Harness Index (cont'd)

Front Passenger's Door Wire Harness ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Passenger's door courtesy light	9	2	Passenger's door		
Passenger's door key cylinder switch	6	3	Passenger's door		
Passenger's door lock actuator	8	2	Passenger's door		
Passenger's door lock knob switch	7	3	Passenger's door		
Passenger's door lock switch	4	3	Passenger's door		
Passenger's door speaker	11	2	Passenger's door		
Passenger's power window motor	10	2	Passenger's door		
Passenger's power window switch	5	6	Passenger's door		
Right power mirror actuator	3	6	Passenger's door		
C701	12	22	Passenger's door jamb area	Front passenger's door sub-harness	

Front Passenger's Door Sub-harness ('99-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Passenger's under-dash fuse/relay box connector E (see page 22-94)	1	2	Behind left kick panel		
Passenger's under-dash fuse/relay box connector F (see page 22-94)	2	20	Behind left kick panel		
C701	12	22	Passenger's door jamb area	Front passenger's door wire harness	



BACK

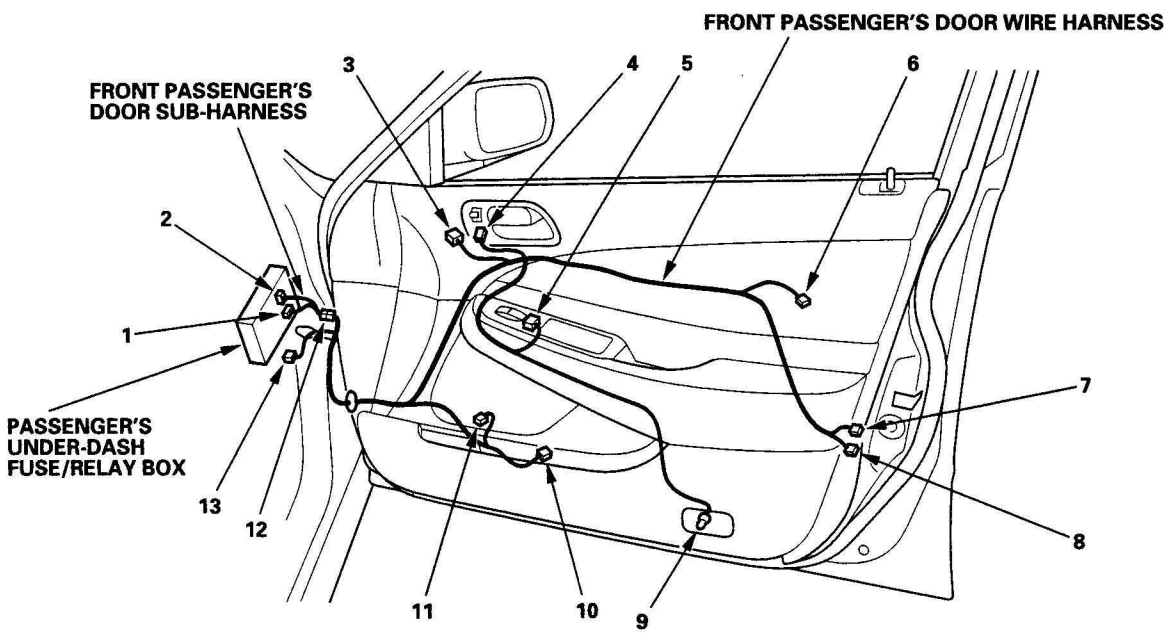
Protected by AR

Front Passenger's Door Wire Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front passenger's door courtesy light	9	2	Front passenger's door		
Front passenger's door key cylinder switch	6	3	Front passenger's door		
Front passenger's door lock actuator	8	2	Front passenger's door		
Front passenger's door lock knob switch	7	3	Front passenger's door		
Front passenger's door lock switch	4	3	Front passenger's door		
Front passenger's door speaker	11	2	Front passenger's door		
Front passenger's power window motor	10	2	Front passenger's door		
Front passenger's power window switch	5	6	Front passenger's door		
Right power mirror actuator	3	13	Front passenger's door		
C558	13	13	Under right side of dash	Dashboard wire harness A (see page 22-56)	
C701	12	22	Front passenger's door jamb area	Front passenger's door sub-harness	

Front Passenger's Door Sub-harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Passenger's under-dash fuse/relay box connector E (see page 22-94)	1	2	Behind left kick panel		
Passenger's under-dash fuse/relay box connector F (see page 22-94)	2	20	Behind left kick panel		
C701	12	22	Front passenger's door jamb area	Front passenger's door wire harness	

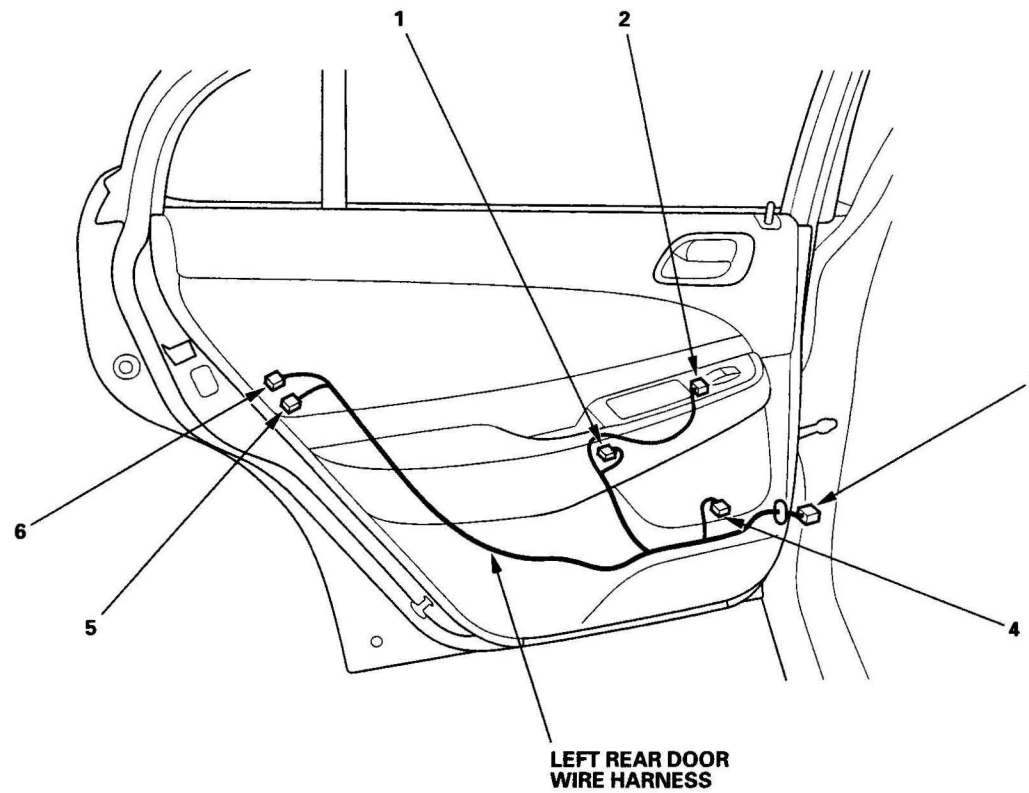


Protected by AR

Connector to Harness Index (cont'd)

Left Rear Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Left rear door lock actuator	5	2	Left rear door		
Left rear door lock knob switch	6	3	Left rear door		
Left rear door speaker	4	2	Left rear door		
Left rear power window motor	1	2	Left rear door		
Left rear power window switch	2	6	Left rear door		
C554	3	10	Left rear door	Left side wire harness (see page 22-62)	'99-01 models
C554	3	10	Left rear door	Left side wire harness (see page 22-64)	'02-03 models

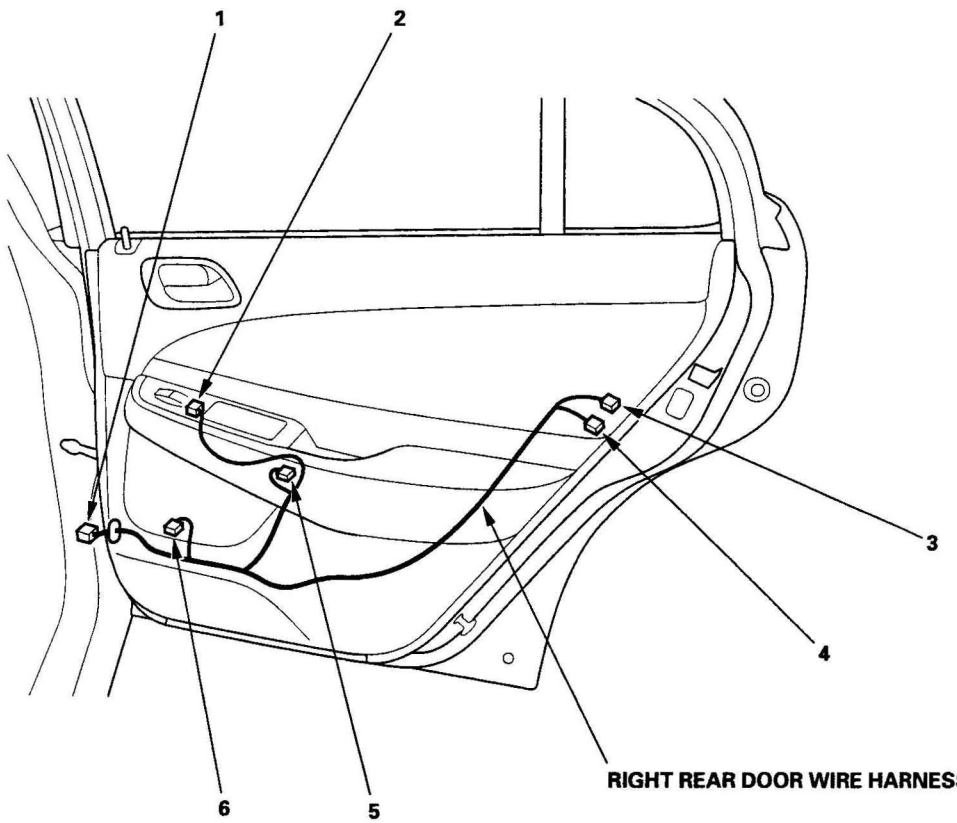


BACK

Protected by AR

Right Rear Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Right rear door lock actuator	4	2	Right rear door		
Right rear door lock knob switch	3	3	Right rear door		
Right rear door speaker	6	2	Right rear door		
Right rear power window motor	5	2	Right rear door		
Right rear power window switch	2	6	Right rear door		
C582	1	10	Right rear door	Right side wire harness (see page 22-66)	'99-01 models
C582	1	10	Right rear door	Right side wire harness (see page 22-68)	'02-03 models



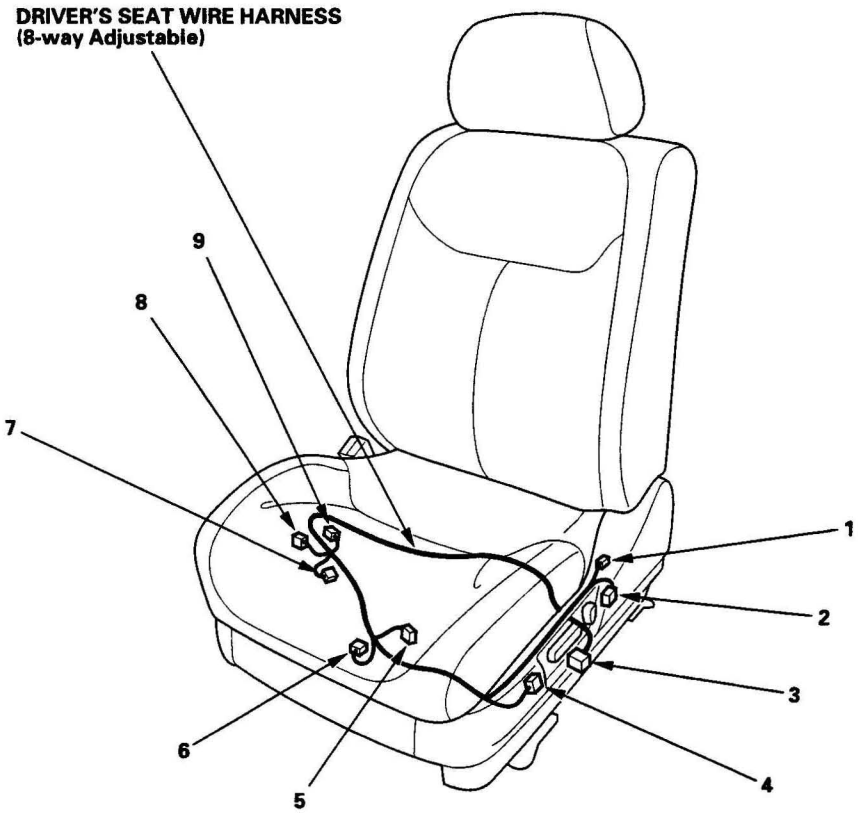
RIGHT REAR DOOR WIRE HARNESS

Protected by AR

Connector to Harness Index (cont'd)

Driver's Seat Wire Harness (8-way Adjustable) ('99 Model)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's seat belt switch	9	2	Under driver's seat		
Driver's seat heater	7	3	Under driver's seat		
Driver's power seat adjustment switch connector A	4	6	Left side of driver's seat		
Driver's power seat adjustment switch connector B	2	6	Left side of driver's seat		
Front up-down motor	5	4	Under driver's seat		
Recline motor	1	2	Under driver's seat		
Rear up-down motor	8	4	Under driver's seat		
Slide motor	6	2	Under driver's seat		
C553	3	10	Left side of driver's seat	Left side wire harness (see page 22-62)	

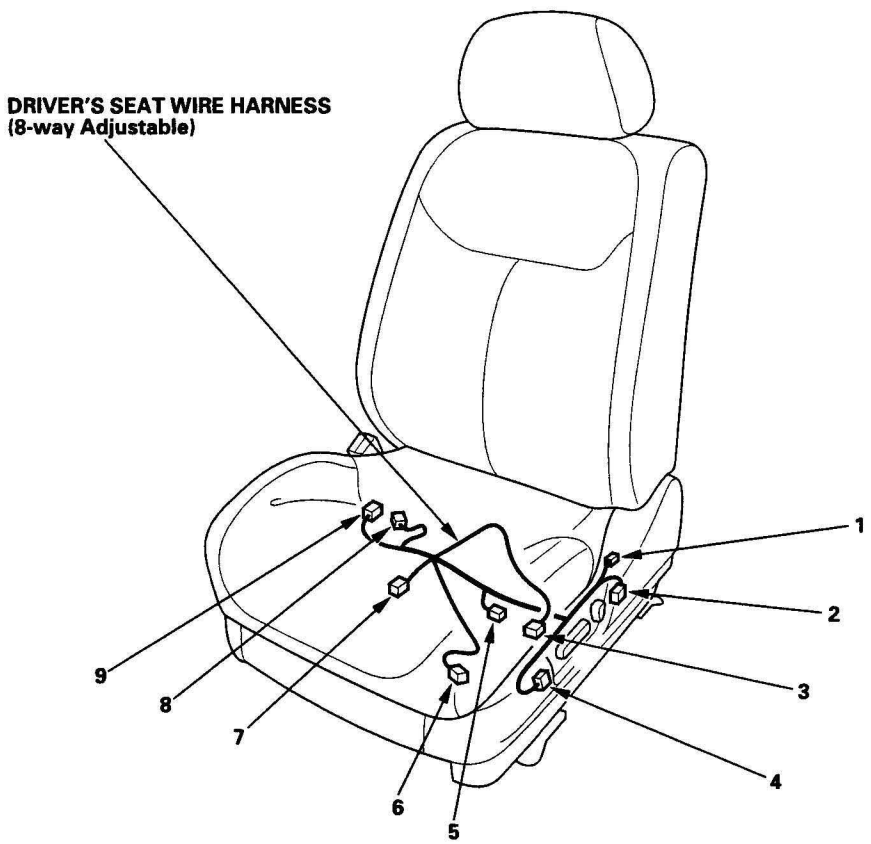


BACK

Protected by AR

Driver's Seat Wire Harness (8-way Adjustable) ('00-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's power seat adjustment switch connector A	4	6	Left side of Driver's seat		
Driver's power seat adjustment switch connector B	2	6	Left side of Driver's seat		
Driver's seat belt switch	9	3	Under Driver's seat		
Driver's seat heater	7	4	Under Driver's seat		
Front up-down motor	5	4	Under Driver's seat		
Rear up-down motor	8	4	Under Driver's seat		
Recline motor	1	2	Under Driver's seat		
Slide motor	6	2	Under driver's seat		
C553	3	10	Under driver's seat	Left side wire harness (see page 22-62)	

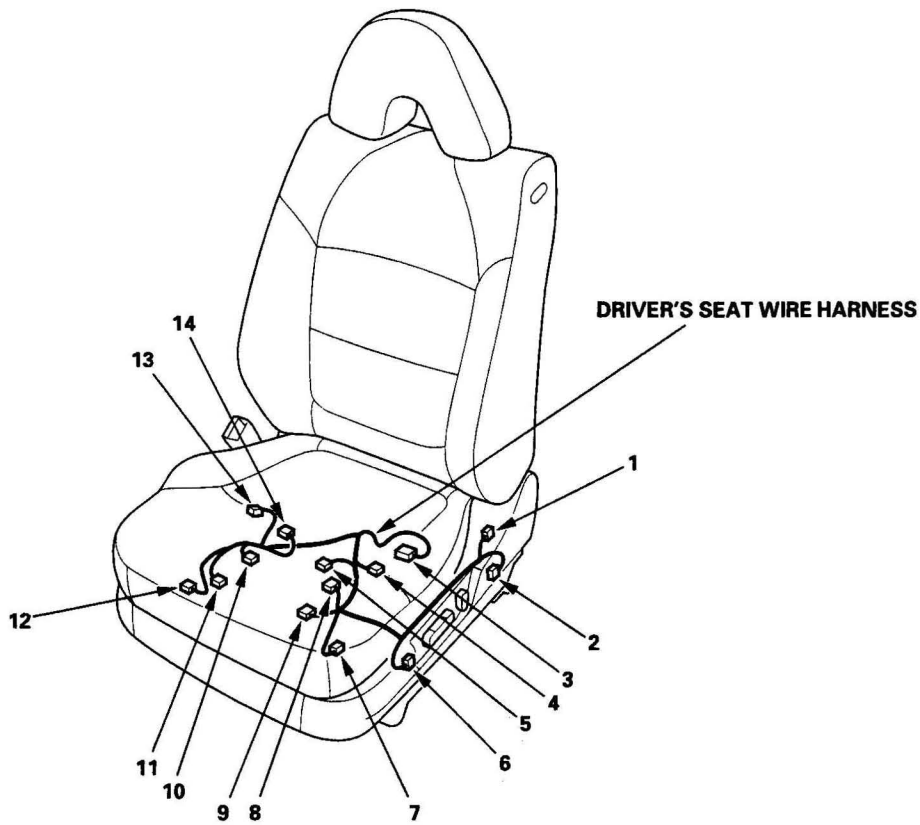


Protected by AR

Connector to Harness Index (cont'd)

Driver's Seat Wire Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's power seat adjustment switch connector A	6	6	Left side of driver's seat		
Driver's power seat adjustment switch connector B	2	6	Left side of driver's seat		
Driver's seat belt switch	13	3	Under driver's seat		
Driver's seat heater	5	4	Under driver's seat		
Front up-down motor	4	5	Under driver's seat		
Power seat control unit connector A	8	20	Under driver's seat		
Power seat control unit connector B	9	8	Under driver's seat		
Power seat control unit connector C	10	12	Under driver's seat		
Power seat control unit connector D	11	6	Under driver's seat		
Rear up-down motor	14	5	Under driver's seat		
Recline motor	1	6	Under driver's seat		
Slide motor	7	2	Under driver's seat		
Slide position sensor	12	3	Under driver's seat		
C553	3	24	Under driver's seat	Left side wire harness (see page 22-64)	'02 model
C553	3	22	Under driver's seat	Left side wire harness (see page 22-64)	'03 model

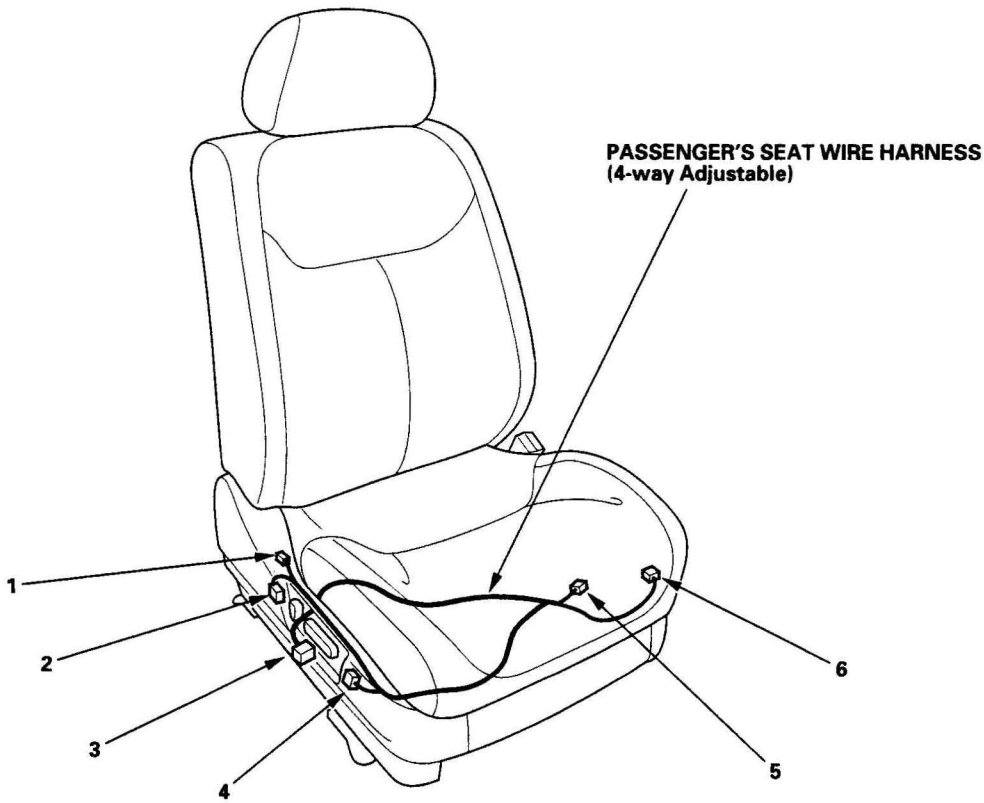


BACK

Protected by AR

Passenger's Seat Wire Harness (4-way Adjustable) ('99 Model)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Passenger's power seat adjustment switch connector A	4	6	Right side of passenger's seat		
Passenger's power seat adjustment switch connector B	2	6	Right side of passenger's seat		
Passenger's seat heater	5	3	Under passenger's seat		
Recline motor	1	2	Under passenger's seat		
Slide motor	6	2	Under passenger's seat		
C581	3	8	Right side of passenger's seat	Right side wire harness (see page 22-66)	

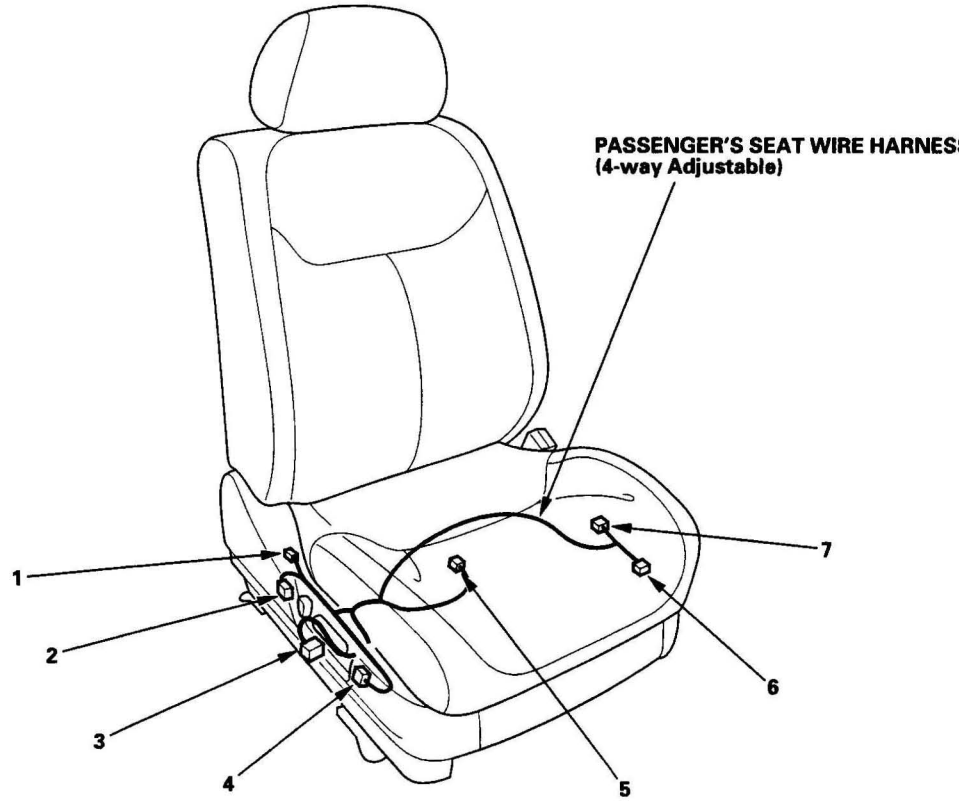


Protected by AR

Connector to Harness Index (cont'd)

Passenger's Seat Wire Harness (4-way Adjustable) ('00-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Passenger's power seat adjustment switch connector A	4	6	Right side of passenger's seat		
Passenger's power seat adjustment switch connector B	2	6	Right side of passenger's seat		
Passenger's seat belt switch	7	3	Under passenger's seat		
Passenger's seat heater	5	4	Under passenger's seat		
Recline motor	1	2	Under passenger's seat		
Slide motor	3	2	Under passenger's seat		
C581	6	10	Right side of passenger's seat	Right side wire harness (see page 22-66)	

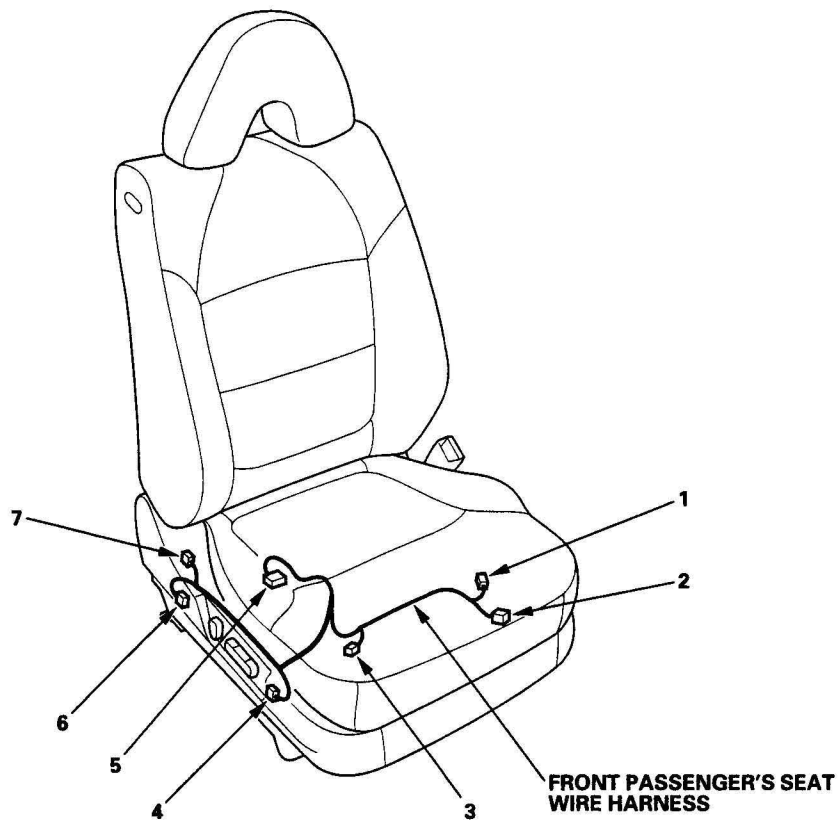


BACK

Protected by AR

Front Passenger's Seat Wire Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front passenger's power seat adjustment switch connector A	4	6	Right side of front passenger's seat		
Front passenger's power seat adjustment switch connector B	6	6	Right side of front passenger's seat		
Front passenger's seat belt switch	1	3	Under front passenger's seat		
Front passenger's seat heater	3	4	Under front passenger's seat		
Recline motor	7	2	Under front passenger's seat		
Slide motor	2	2	Under front passenger's seat		
C581	5	10	Under front passenger's seat	Right side wire harness (see page 22-68)	



Protected by AR

Connector to Harness Index (cont'd)

Ignition Switch Lead

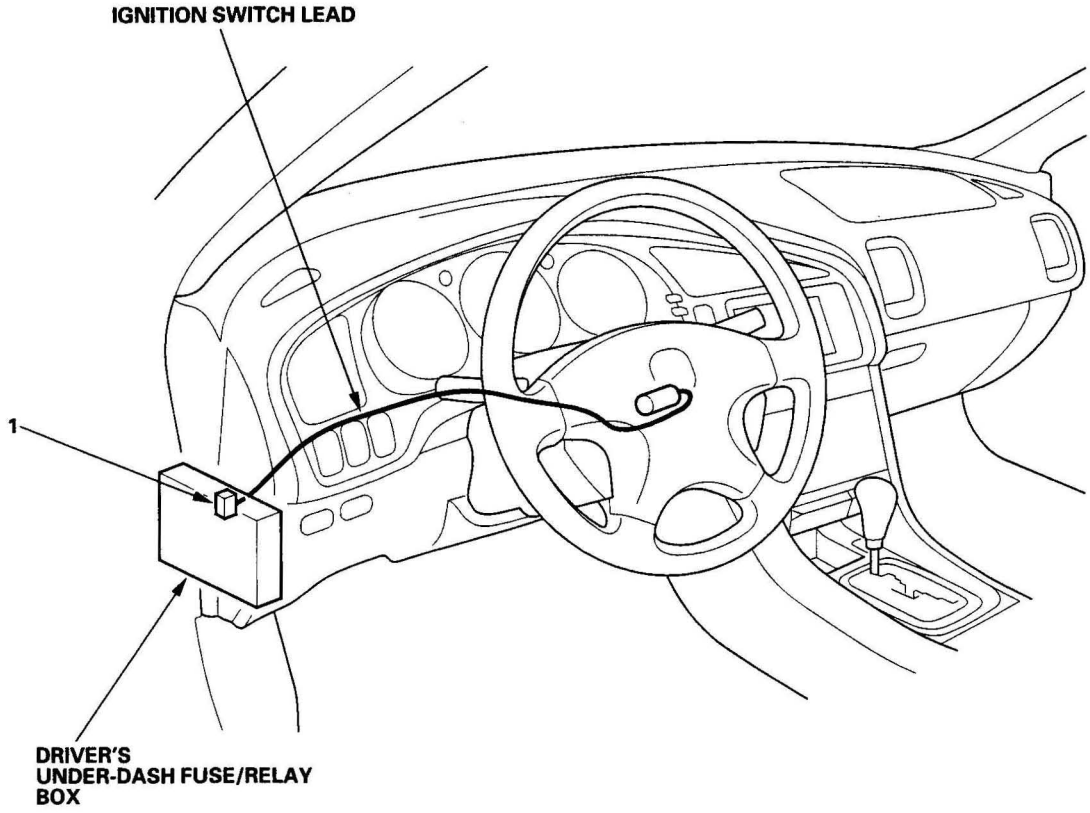
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's under-dash fuse/relay box connector M (see page 22-93)	1	6	Behind left kick panel		

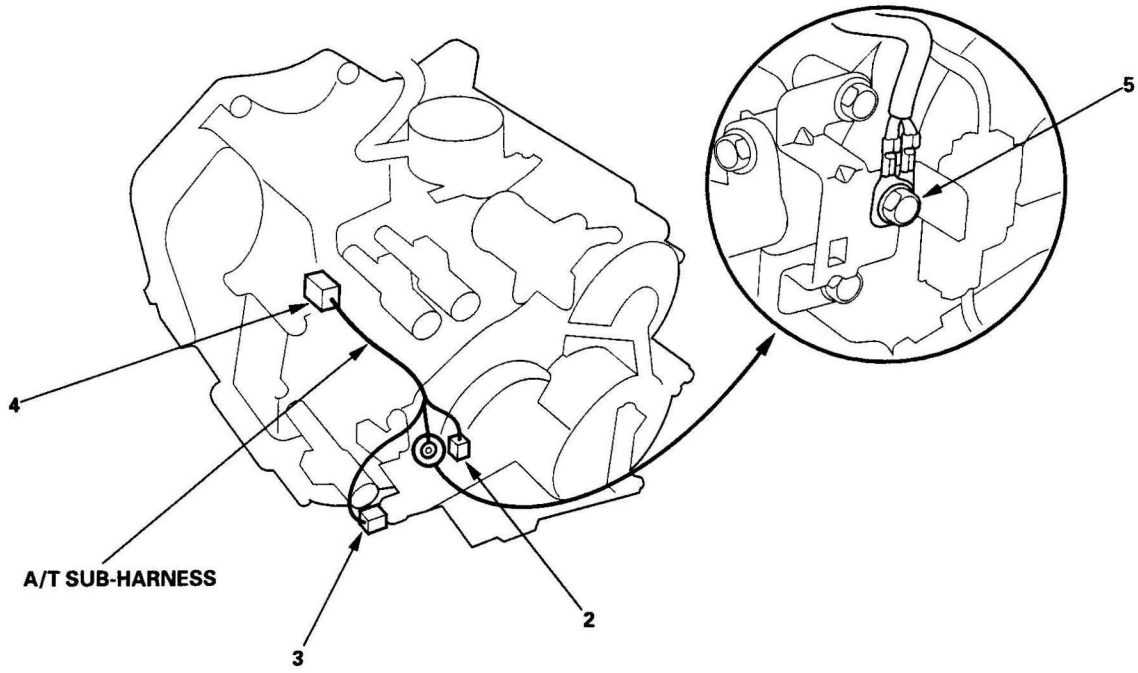
A/T Sub-harness ('00-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
A/T fluid temperature sensor	2	2	Left side of engine compartment		
Third clutch pressure switch	3	1	On transmission housing		
C151	4	8	On transmission housing	Engine wire harness (see page 22-22)	
G151	5		On transmission housing	Body ground via A/T sub-harness	

BACK

Protected by AR





Protected by AR

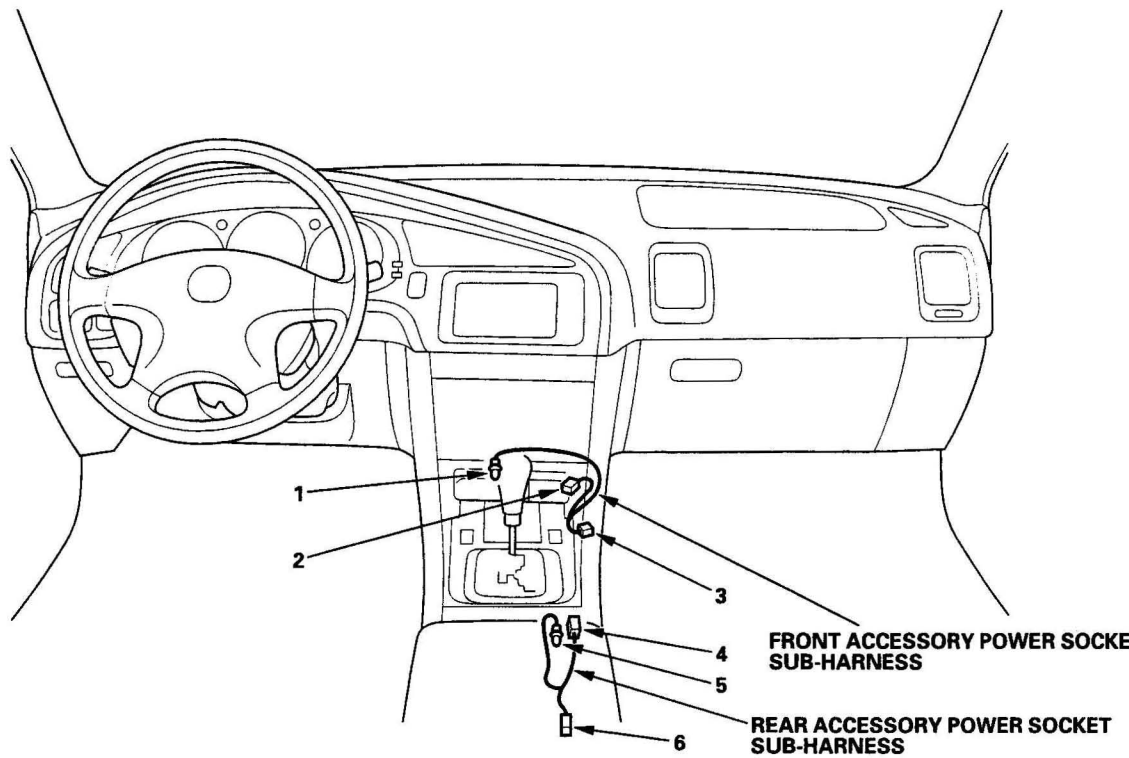
Connector to Harness Index (cont'd)

Front Accessory Power Socket Sub-harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Note
Coin pocket light	1	2	Under middle of dash		
Front accessory power socket	2	2	Under middle of dash		
C403	3	2	Under right side of dash	Dashboard wire harness B (see page 22-44)	'99 mod
C403	3	4	Under right side of dash	Dashboard wire harness B (see page 22-48)	'00-03 models

Rear Accessory Power Socket Sub-harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Console box light	5	2	Behind console box		
Rear accessory power socket	6	2	Behind console box		
C851	4	3	Behind console box	Dashboard wire harness A (see page 22-52)	'99-01 models
C851	4	3	Behind console box	Dashboard wire harness A (see page 22-56)	'02-03 models

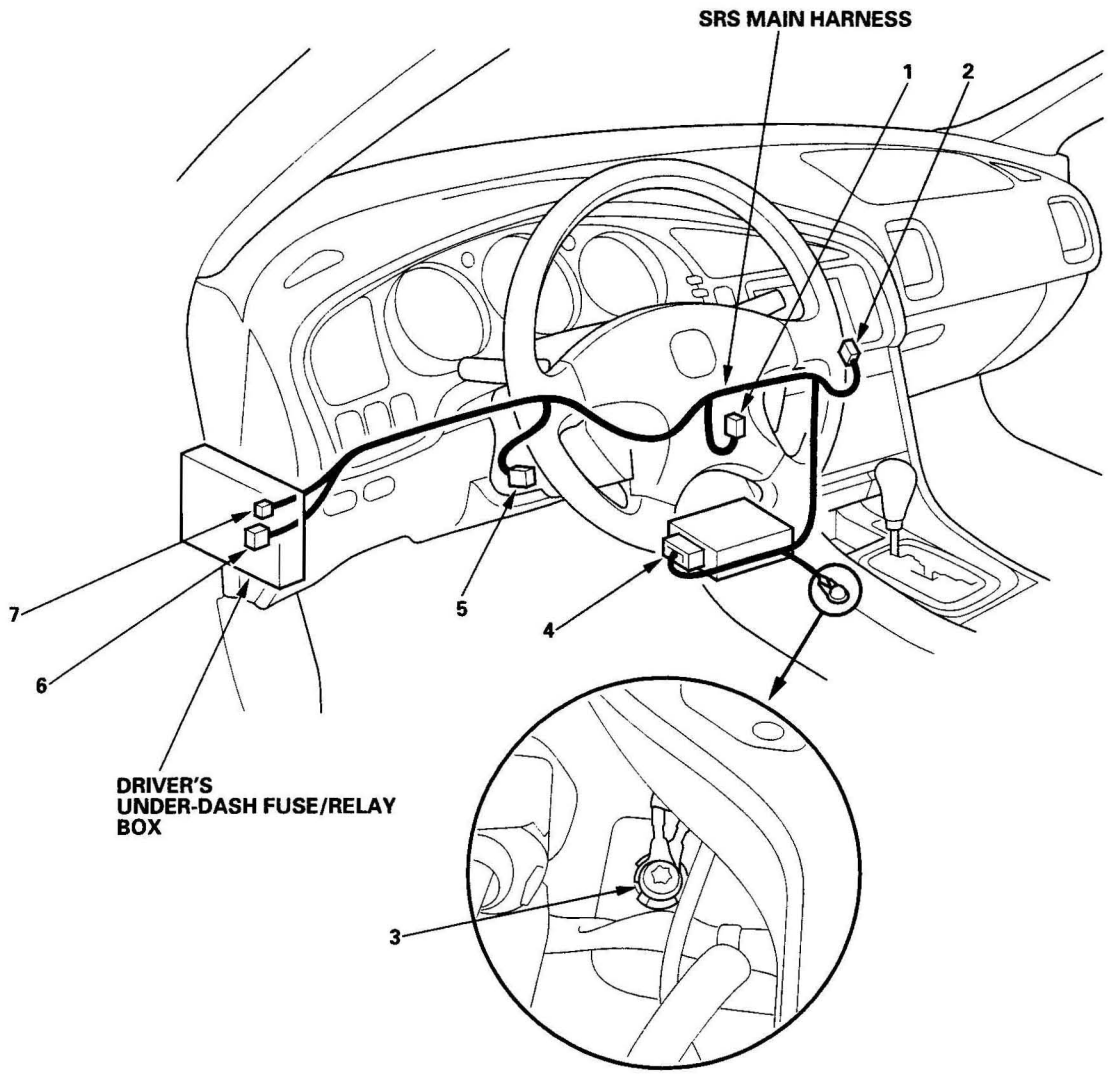


BACK

Protected by AR

SRS Main Harness ('99 Model)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Cable reel	5	2	Under left side of dash		
Driver's under-dash fuse/relay box connector N (see page 22-93)	7	2	Behind left kick panel		
Front passenger's airbag assembly	2	2	Behind glove box		
Memory erase signal (MES) connector	6	2	Under left side of dash		
SRS unit	4	18	Middle of floor		
C801	1	3	Under middle of dash	Dashboard wire harness A (see page 22-52)	
G801	3		Middle of floor	Body ground via SRS main harness	



Protected by AR

Connector to Harness Index (cont'd)

SRS Main Harness ('00-01 Models)

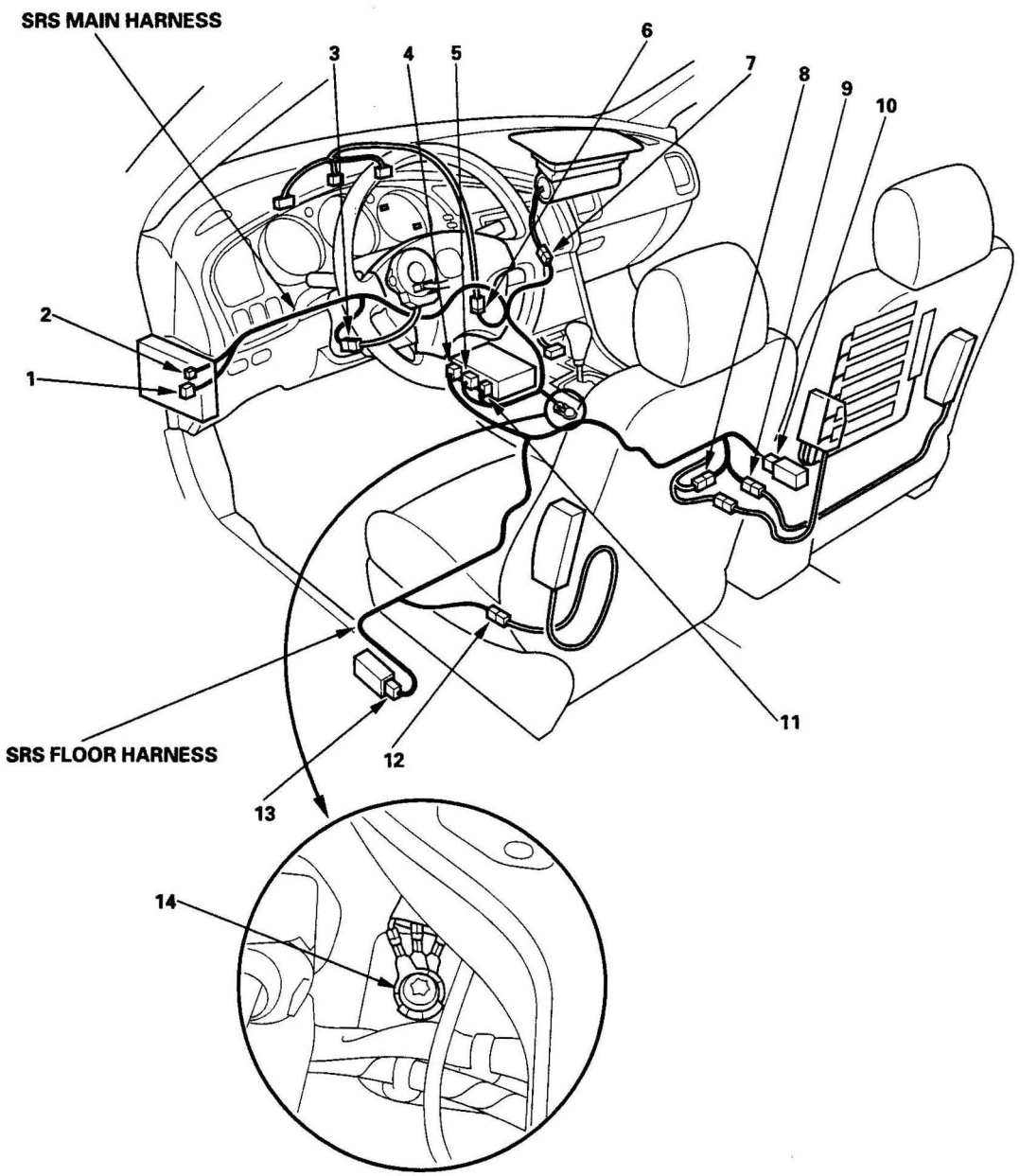
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Cable reel	3	2	Under left side of dash		
Driver's under-dash fuse/relay box connector N (see page 22-93)	1	2	Behind left kick panel		
Front passenger's airbag assembly	7	4	Behind glove box		
SRS memory erase signal (MES) connector	2	2	Behind left kick panel		
SRS unit connector B	4	18	Middle of floor		
SRS unit connector C	11	8	Middle of floor		
C801	6	8	Under middle of dash	Dashboard wire harness A (see page 22-52)	
G801	14		Middle of floor	Body ground via SRS main harness	

SRS Floor Harness ('00-01 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's side airbag inflator	12	2	Under driver's seat		
Driver's side impact sensor	13	4	Left side of floor		
Front passenger's side airbag inflator	9	2	Under front passenger's seat		
Front passenger's side impact sensor	10	4	Right side of floor		
SRS unit connector A	5	14	Middle of floor		
C583	8	1	Under middle of dash	Right side wire harness (see page 22-66)	

BACK

Protected by AR



Protected by AR

Connector to Harness Index (cont'd)

SRS Main Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Cable reel	18	4	Under left side of dash		
Driver's under-dash fuse/relay box connector N (see page 22-93)	19	2	Under left side of dash		
Front passenger's airbag assembly	5	4	Under middle of dash		
SRS unit connector B	1	18	Under middle of dash		
C801	4	4	Under middle of dash	Dashboard wire harness A	
G801	6		Under middle of dash	Body ground via SRS main harness	

SRS Floor Harness ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's side airbag inflator	15	2	Under driver's seat		
Driver's side impact sensor	17	4	Left B-pillar		
Front passenger's side airbag inflator	10	2	Under front passenger's seat		
Front passenger's side impact sensor	7	4	Right B-pillar		
SRS unit connector A	2	14	Under middle of dash		
C560	16	1	Under driver's seat	Left side wire harness	'03 model Navigation
C583	12	1	Under front passenger's seat	Right side wire harness	

Dashboard Wire Harness A (SRS branch) ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Memory erase signal (MES) connector	20	2	Under left side of dash		
SRS unit connector C	3	8	Under middle of dash		
C801	4	4	Under middle of dash	SRS main harness	

Left Side Wire Harness (SRS branch) ('02-03 Models)

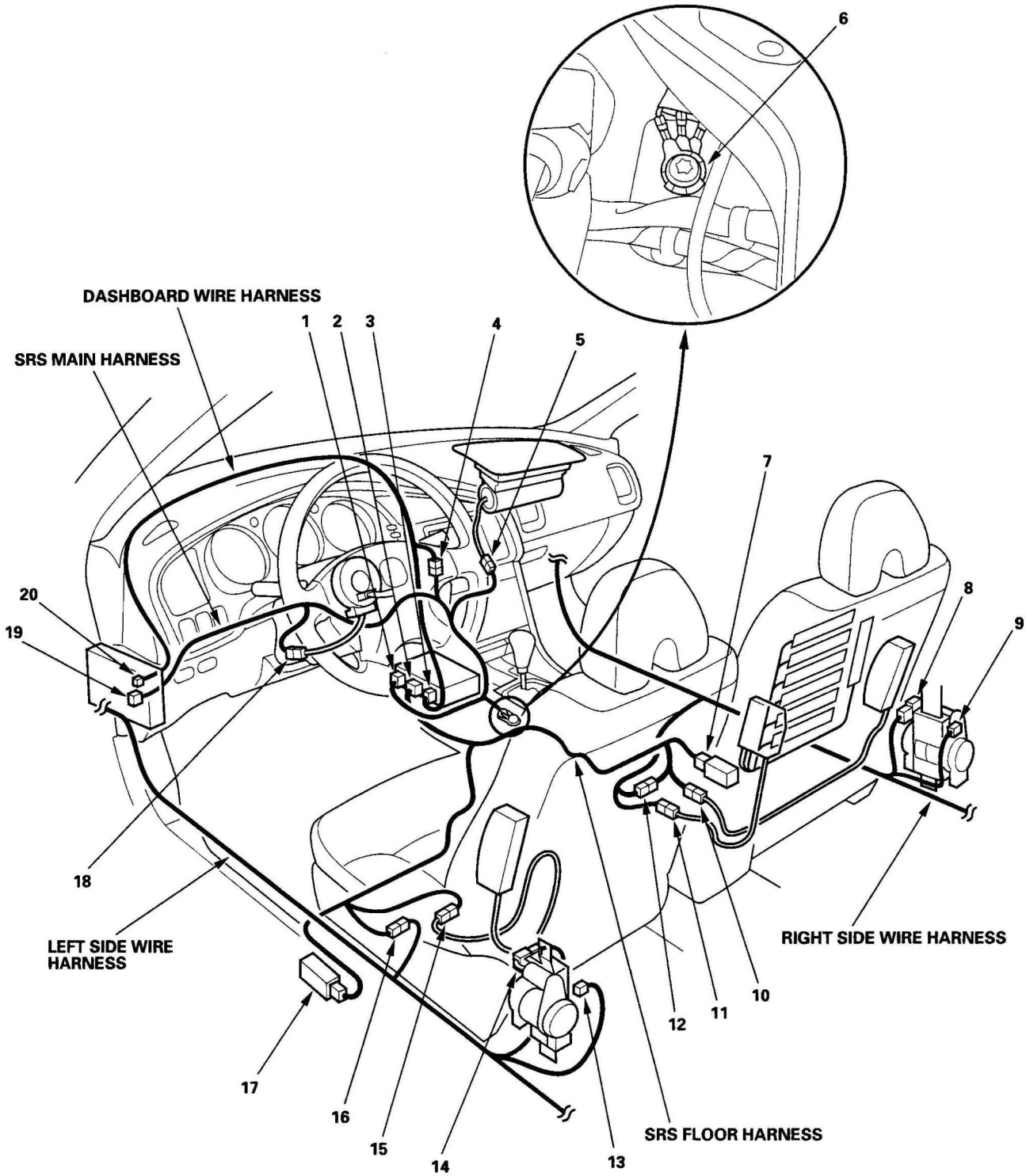
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's seat belt tensioner	14	2	Left B-piller		
Driver's seat belt tension reducer solenoid	13	2	Left B-piller		
C560	16	1	Under driver's seat	SRS floor harness	'03 model, Navigation

Right Side Wire Harness (SRS branch) ('02-03 Models)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front passenger's seat belt tensioner	8	2	Right B-piller		
Front passenger's seat belt tension reducer solenoid	9	2	Right B-piller		
OPDS unit	11	4	Under front passenger's seat		
C583	12	1	Under front passenger's seat	SRS floor harness	

BACK

Protected by AR



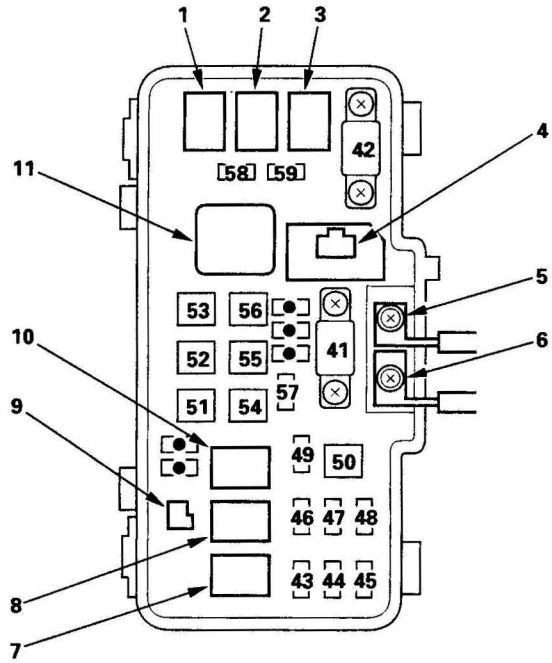
BACK

Protected by AR

Connector to Fuse/Relay Box Index

Under-hood Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	15	18	Right engine compartment wire harness (see page 22-30)
A/C compressor clutch relay	3	4	
B	14	7	Right engine compartment wire harness (see page 22-30)
Blower motor relay	11	4	
C	13	3	Right engine compartment wire harness (see page 22-30)
Condenser fan relay	1	4	
D	12	16	Right engine compartment wire harness (see page 22-30)
Diode	9	—	
ELD Unit	4	3	Right engine compartment wire harness (see page 22-30)
Horn relay	10	4	
Headlight relay 1	7	4	
Headlight relay 2	8	4	
Radiator fan relay	2	4	
T1	6		Battery positive cable (see page 22-17)
T101	5		Engine wire harness (see page 22-18)



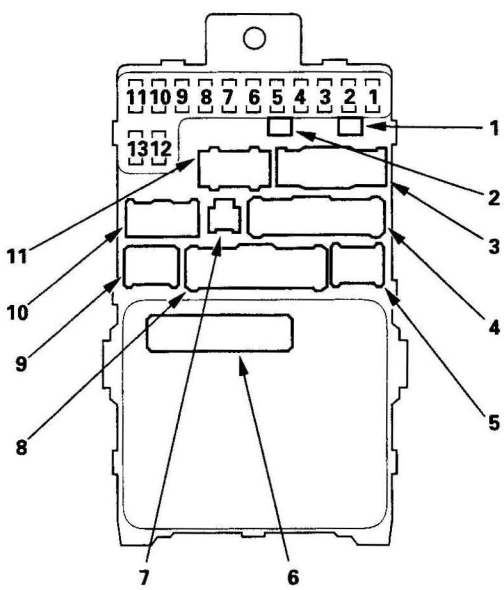


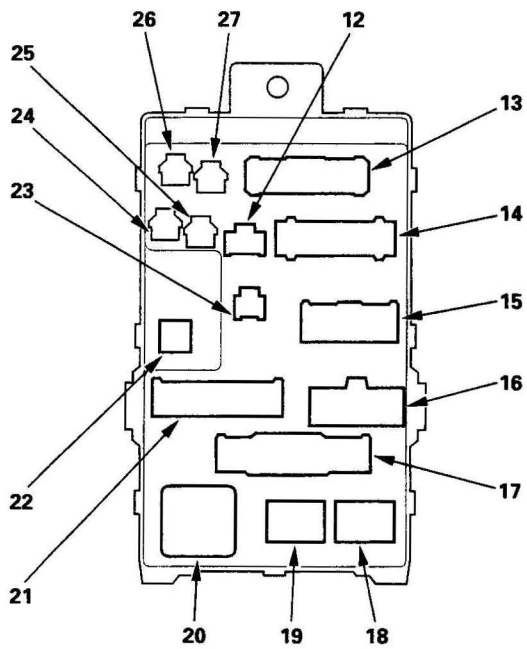
BACK

Protected by AR

Driver's Under-dash Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	11	10	Left side wire harness (see page 22-62)
B	3	14	Left side wire harness (see page 22-62)
C	10	5	Left engine compartment wire harness (see page 22-38)
D	7	———	Not used
Diode	1	———	Driver's door curtesy light
Diode	2	———	Not used
E	4	20	Left engine compartment wire harness (see page 22-38)
F	9	6	Driver's door wire harness (see page 22-72)
G	8	18	Driver's door wire harness (see page 22-72)
H	5	6	Not used
I	13	18	Dashboard wire harness A (see page 22-52)
J	12	2	Multiplex control inspection connector
K	14	18	Dashboard wire harness A (see page 22-52)
L	23	———	Not used
M	15	6	Ignition switch lead (see page 22-84)
Multiplex control unit, driver's, connector A	6	24	(Plugs directly into the fuse box)
N	22	2	SRS main harness (see page 22-87)
O	21	20	Dashboard wire harness B (see page 22-44)
P	16	7	Dashboard wire harness B (see page 22-44)
Q	17	22	Dashboard wire harness B (see page 22-44)
R	26	1	Optional connector
Reverse relay	19	4	
S	27	1	Optional connector
Starter cut relay	18	4	
T	24	1	Optional connector
Turn signal/hazard relay	20	4	
U	25	1	Optional connector





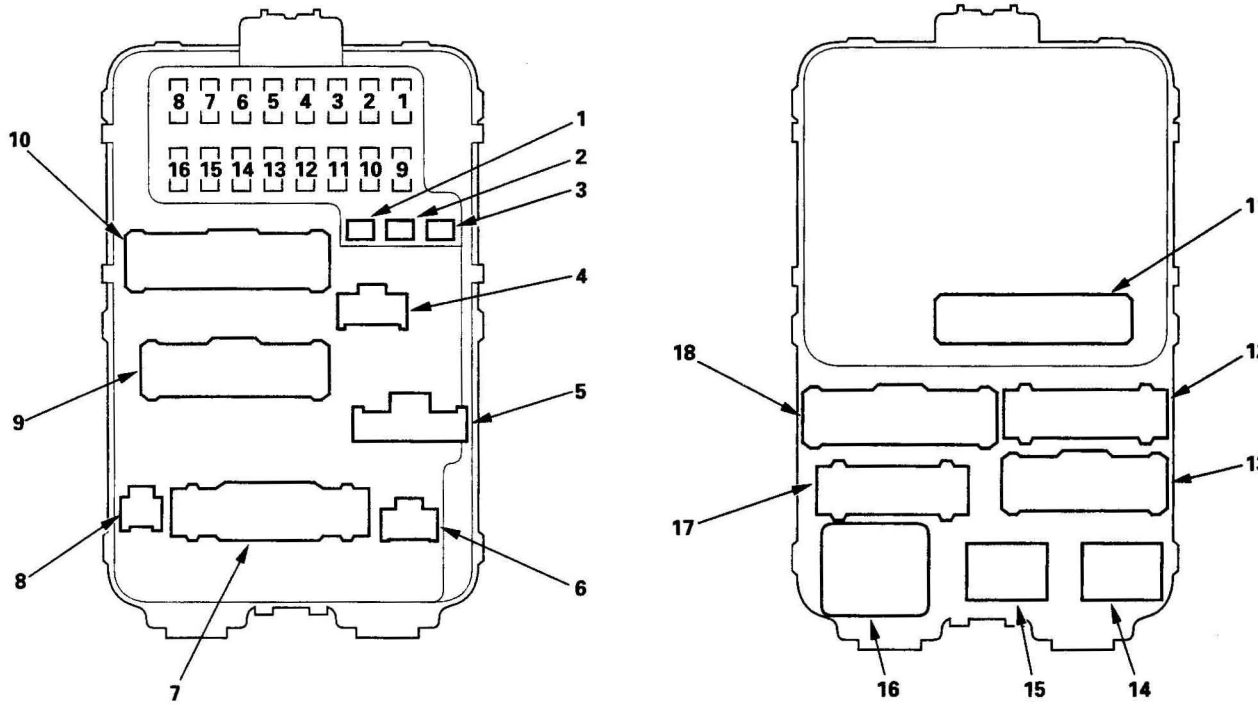
BACK

Protected by AR

Connector to Fuse/Relay Box Index (cont'd)

Passenger's Under-dash Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	10	20	Right side wire harness (see page 22-66)
Accessory power socket relay	15	4	
B	4	4	Roof wire harness (see page 22-71)
C	9	18	Right engine compartment wire harness (see page 22-30)
D	5	3	Right engine compartment wire harness (see page 22-30)
Diode	1	——	Not used
Diode	2	——	Not used
Diode	3	——	Passenger's door curtesy light
E	8	2	Passenger's door wire harness (see page 22-74)
F	7	20	Passenger's door wire harness (see page 22-74)
G	6	——	Not used
H	18	18	Dashboard wire harness A (see page 22-52)
I	12	18	Dashboard wire harness A (see page 22-52)
J	17	16	Dashboard wire harness B (see page 22-44)
K	13	16	Dashboard wire harness B (see page 22-44)
Multiplex control unit, passenger's, connector A	11	24	(Plugs directly into the fuse box)
Power window relay	14	4	
Rear window defogger relay	16	4	

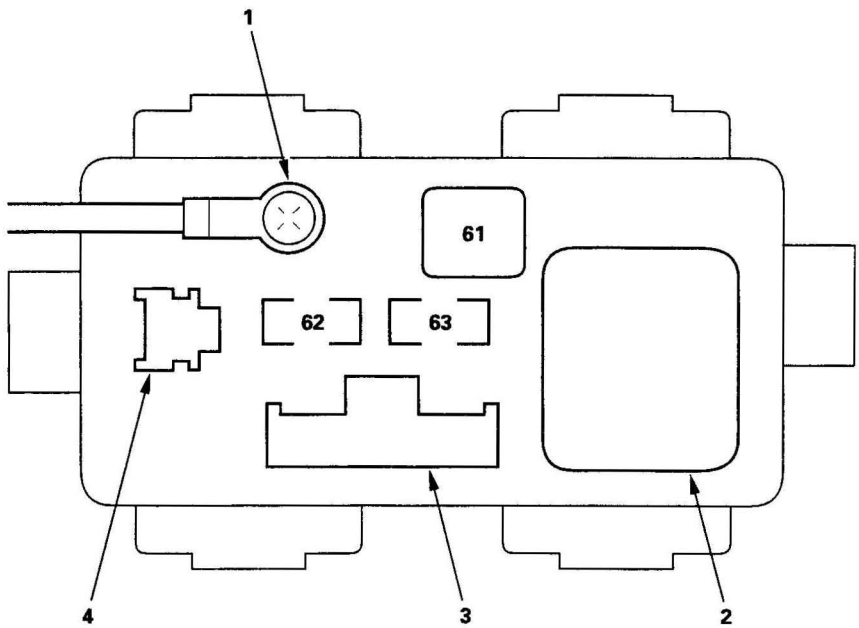


BACK

Protected by AR

Under-hood ABS Fuse/Relay Box ('02-03 Models)

Socket	Ref	Terminal	Connects to
A	4	2	Left engine compartment wire harness (see page 22-42)
ABS pump motor relay	2		
B	3	3	Left engine compartment wire harness (see page 22-42)
T5	1		Starter cable



Protected by AR

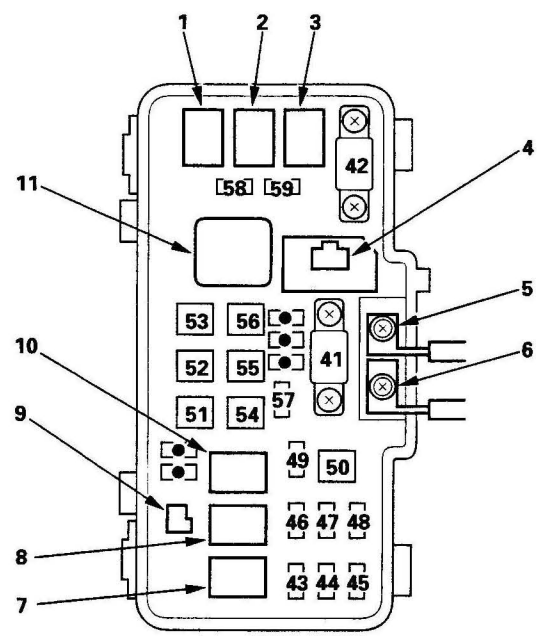
Power Distribution

Fuse to Components Index

Under-hood Fuse/Relay Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
41	120A	———	Battery, Power distribution
42	60A	WHT	Ignition switch (BAT)
43	20A	RED/GRN	Right headlight, Daytime running lights control unit (Canada)
44	———	———	Not used
45	20A	RED/YEL	High beam indicator light, Left headlight, Daytime running lights control unit (Canada), High beam cut relay (Canada)
46	15A	WHT/GRN	Data link connector (DLC), PGM-FI main relay
47	20A	WHT/YEL	ABS/TCS control unit * 2, Brake lights, Cruise control unit, High mount brake light, Horns, Ignition key light, Key interlock solenoid, Multiplex control unit, driver's, VSA control unit * 1
48	20A	GRN*1	VSA modulator unit (via VSA relay)
		BLU*2	ABS/TCS modulator unit (via TCS relay)
49	15A	WHT/GRN	Hazard warning lights
50	20A	PNK*1	VSA control unit (via VSA throttle motor relay)
51	40A	WHT/BLU	No. 1, 7, 8, 15 and 16 fuses (in the passenger's under-dash fuse/relay box)
52	20A	BLU/RED	Fog lights
53	40A	WHT/GRN	Rear window defogger (via rear window defogger relay in the passenger's under-dash fuse/relay box)
54	40A	YEL	No. 9, 10, 11, 12 and 13 fuses (in the passenger's under-dash fuse/relay box)
55	40A	YEL/GRN	No. 2, 3, 4, 5 and 6 fuses (in the passenger's under-dash fuse/relay box)
56	40A	YEL/BLK	Blower motor
57	30A*1	BLU/BLK	Fan control relay, Radiator fan motor
	20A*2		Radiator fan motor
58	30A*1	BLU/YEL	Condenser fan motor
		WHT	No. 14 fuse (in the passenger's under-dash fuse/relay box)
	20A*2	BLU/YEL	Condenser fan motor
		WHT	Fan control module
		RED	Compressor clutch
59	15A	RED/GRN	A/T gear position console light, Audio unit, Climate control unit, Clock, Cruise main/VSA (or TCS) switch light, Dash light brightness controller, Gauge lights, Glove box light, Hazard warning light, License plate light, Multiplex control units, Mode switch light, Moonroof switch light, Navigation display and unit, Parking lights, Seat heater switch light, Side marker lights, Select/reset switch light, Taillights, Vanity mirror lights

* 1: TYPE S
* 2: PREMIUM



● : Spare fuse

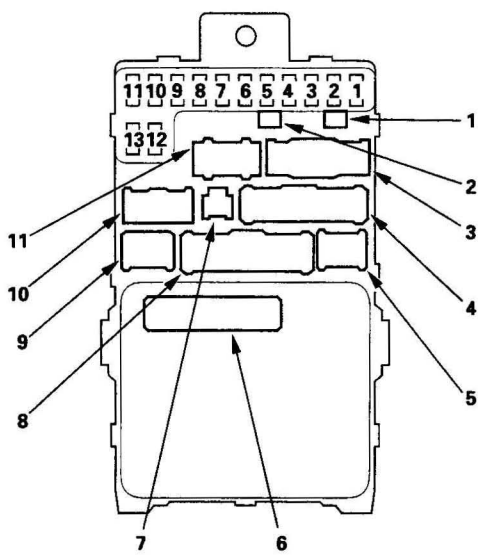
BACK

Protected by AR

Driver's Under-dash Fuse/Relay Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	15A	RED/WHT	PGM-FI main relay
		RED/WHT or GRN	SRS unit (VA)
2	10A	PNK or GRN	SRS unit (VB)
3	7.5A	BLK/YEL	A/C compressor clutch relay, Blower motor relay, Climate control unit, Fan control module, Fan control relay * 6, Rear window defogger relay, Recirculation control motor
4	7.5A	YEL/BLK	ABS/TCS control unit, Power mirror actuators, Power mirror defoggers, Seat heater relay, BSC control unit
		Fuse/relay box socket	Optional connector
5	7.5A	YEL/RED	Daytime running lights control unit (Canada)
6	15A	BLK/YEL	Alternator, Charging system light, Cruise control main switch, Cruise control unit, ELD unit, Engine mount control solenoid valve, EVAP bypass solenoid valve, EVAP canister vent shut valve, EVAP canister purge valve,Fan control module, Gauge assembly, PCM, Primary and secondary heated oxygen sensors, Intake manifold runner control, IMRC module * 6, VSA control unit * 6
7	7.5A	YEL/GRN	Multiplex control unit, driver's * 1, OPDS unit * 3, OnStar control unit * 5 (with Navigation) Shift lock relay * 1, Windshield washer motor * 1
8	7.5A	YEL/BLK	Accessory power socket relay, Navigation display and unit, Navigation relay * 3, Shift lock solenoid, OnStar control unit * 5 (with Navigation)
		Fuse/relay box socket	Optional connector
9	7.5A	YEL	A/T reverse relay, Automatic dimming mirror, Back-up lights * 2, Brake light failure sensor, Tension reducer solenoid * 4, Clock, DRL indicator light (Canada), Gauge assembly, Keyless receiver unit * 4, Multiplex control unit, passenger's, Power seat control unit * 4, Shift lock relay * 3, OnStar switches and microphone/automatic dimming mirror * 5 (with Navigation)
		Fuse/relay box socket	Multiplex control unit, driver's
10	7.5A	YEL/RED	Hazard warning switch
11	15A	BLK/YEL	Ignition coils
12	30A	GRN/BLK	Windshield wiper/washer switch, Windshield wiper intermittent relay, Windshield wiper motor, Windshield washer motor * 3, Multiplex control unit, driver's * 3
13	7.5A	BLU/ORN	PCM, PGM-FI main relay

* 1: '99 model
* 2: '99-01 models
* 3: '00-03 models
* 4: '02-03 models
* 5: '03 model
* 6: TYPE S



(cont'd)

Protected by AR

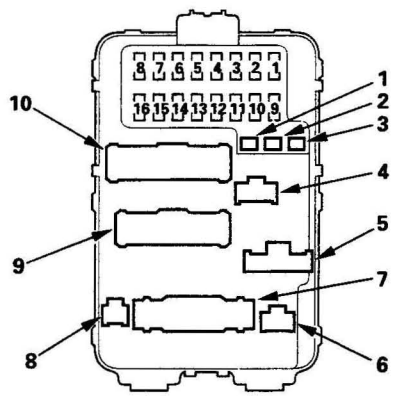
Power Distribution

Fuse to Components Index (cont'd)

Passenger's Under-dash Fuse/Relay Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	30A*2	GRN*2	Moonroof relays
	20A*4	GRN/WHT*4	Power window control unit
2	20A	RED	Driver's power seat recline motor and rear up-down motor * 2, Power seat controlo unit * 4
3	20A	WHT/GRN	Driver's and passenger's seat heaters
4	20A	BLU	Driver's power seat slide motor and front up-down motor * 2, Driver's power seat control unit * 4
5	20A	RED	Front passenger's power seat slide motor, Multiplex control unit, passenger's * 4
6	20A	WHT/RED	Front passenger's power seat recline motor
7	20A	WHT/YEL	Power window control unit * 4, Left rear power window switch, Moonroof relays, Multiplex control unit, door * 4
8	20A	BLU/BLK	Front passenger's power window switch
9	20A	WHT/GRN	Audio unit, Front and rear accessory power sockets, Stereo amplifier
10	10A	RED/YEL	Navigation display and unit, OnStar control unit * 5 (with Navigation)
		RED/BLU	Daytime running lights control unit (Canada)
11	7.5A	WHT/BLU	Ceiling light, Courtesy light, Power seat control unit * 4, Spotlights, Trunk light
12	20A	WHT	Trunk lid opener solenoid
		Fuse/relay box socket	Multiplex control unit, passenger's
13	7.5A	WHT/YEL*1	Climate control unit, Clock, Gauge assembly, Immobilizer indicator light, Multiplex control units, driver's and door, PCM (VBU), Security indicator light, Power window control unit, Fan control module, Driving position memory switch * 4, Keyless receiver unit * 4
		WHT/RED*3	
		Fuse/relay box socket	Multiplex control unit, passenger's
14	7.5A	GRN	A/C compressor clutch * 6
15	20A*2	GRN/WHT*2	Driver's power window motor, Power window control unit
	30A*4	GRN*4	Moonroof relays
16	20A	WHT/BLK	Right rear power window switch

* 1: '99 model
* 2: '99-01 models
* 3: '00-03 models
* 4: '02-03 models
* 5: '03 model
* 6: TYPE S



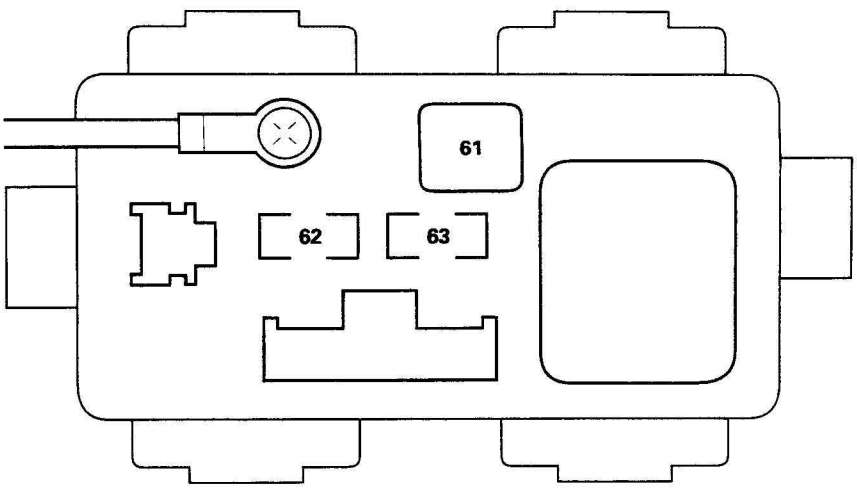
BACK

Protected by AR

Under-hood ABS Fuse/Relay Box ('02-03 Models)

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
61	40A	———	ABS pump motor
62	20A	WHT/GRN	ABS pump motor relay, Fail safe relay, TCS relay, VSA relay * 1, ABS/TCS modulator unit, VSA modulator unit * 1
63	7.5A	GRN	VSA control unit, ABS/TCS control unit

* 1: TYPE S



Protected by AR

Ground Distribution

Ground to Components Index

Ground	Component or Circuit Grounded
G1	Battery, Transmission housing
G2	Engine block
G101, and G102 ('00-03 Models)	PCM (PG1 and PG2 are BLK; LG1 and LG2 are BRN/YEL) BLK: EGR valve, IAC valve, Ignition coils, PGM-FI main relay, Radiator fan switch A (PREMIUM), Radiator fan switch A and B (TYPE S), Transmisson range switch BRN/YEL: Data link connector (DLC), Immobilizer receiver unit, VTEC oil pressure switch Shift control solenoid valves ('99 model), VSS (with navigation) ('99 model)
	Shielding between the PCM and these components have BRN/YEL ('99 model: BRN/BLK) wires: CKP/TDC sensor ('99 model), CYP sensor ('99 model), CKP sensor, Knock sensor (KS), Primary and secondary HO2S, TDC 1/2 sensors
G151	Lock-up control solenoid valve, Shift control solenoid valve A, Shift control solenoid valve B, Shift control solenoid valve C
G201	Condenser fan motor ('99-01 models), Hood switch ('99-01 models), Keyless buzzer ('00-01 models), Right headlight (low beam), Right front turn signal/parking lights, Right side marker light, Right fog light, Windshield washer fluid level switch (Canada), Windshield washer motor
G202	ABS fail-safe relay, Blower motor relay, Cruise control actuator, ELD unit, Fan control relay (TYPE S), Keyless buzzer ('02-03 models), Power steering pressure (PSP) switch, VSA control unit (TYPE S), Navigation relay ('99 model)
G203	ABS pump motor, ABS/TCS modulator unit (PREMIUM), VSA control unit (TYPE S)
G204	Condensor fan motor ('02-03 models),, Radiator fan motor ('02-03 models), Radiator fan switch C (TYPE S), Security hood switch ('02-03 models)
G301	Left headlight (low beam), Left side marker light, Left fog light, Left front turn signal/parking lights
G302	Brake fluid level switch, Seat heater relay, Security horn ('99 model), Shift lock relay, Windshield wiper intermittent relay, Windshield wiper motor, Intake manifold runner control (IMRC) module (TYPE S)
G401	Climate control unit, Combination light switch (2 wires), Data link connector (DLC), Daytime running lights control unit (Canada) (2 wires), Driver's door key cylinder switch, Driver's door lock switch, Driver's door lock knob switch, Driving position memory switch, Fan control module, Front accessory power socket, Ignition key switch, Multiplex control units, driver's and door, Multiplex control inspection connector, Power transistor, Turn signal/hazard relay, Windshield wiper/washer switch
G402	ABS/TCS control unit (PREMIUM), VSA control unit (TYPE S) (4 wires)
G403	ABS/TCS control unit (PREMIUM) (2 wires), VSA control unit (TYPE S) (4 wires)
G501	A/T gear position indicator panel light, Clock, Console box light, Cruise/TCS/VSA switch light, Cruise control unit, Fuel gauge sending unit, Gauge assembly (2 wires), Glove box light, Keyless receiver unit, Mode switch, Moonroof switch and relays, Navigation display unit, Parking pin switch, Rear accessory power socket, Seat heater switches, Select/reset switch
	'99 model: Shielding between the audio unit and navigation unit have BRN/WHT (dashboard wire harness A) and BRN/YEL (left side wire harness) wires
	('99-02 models) Shielding between audio unit and navigation unit have BRN/WHT wire
G502	Audio unit, Stereo amplifier ('02-03 models)
G503	Driver's power seat control unit, multiplex control unit, driver's, Memory erase signal (MES) connector
G504	Multiplex control unit, passenger's
G551	Driver's power seat control unit, driver's power seat switch (2 wires), Driver's seat belt switch, Driver's seat heater, High mount brake light, Navigation unit, Left power mirror defogger, Left rear door lock knob switch, Multiplex control unit, door (2 wires), Onstar control unit ('03 model), Power mirror switch, Power window control unit
G552	Fuel pump (FP)
G581	Accessory power socket relay, Automatic dimming mirror, Front passenger's power seat switch ('00-03 models) (2 wires), Front passenger's seat belt switch, Front passenger's seat heater, Multiplex control unit, passenger's, OPDS unit ('00-03 models), Front passenger's door key cylinder switch, Front passenger's door lock switch, Rear passenger's door lock knob switch, Power window relay, Right power mirror defogger, Spotlights, Vanity mirror lights
G601	Brake/Taillights, Brake light failure sensor, License plate light, Rear turn signal lights, Trailer lighting connector, Trunk lid latch switch, Trunk opener solenoid
G801	SRS unit (2 wires)

BACK

Protected by AR

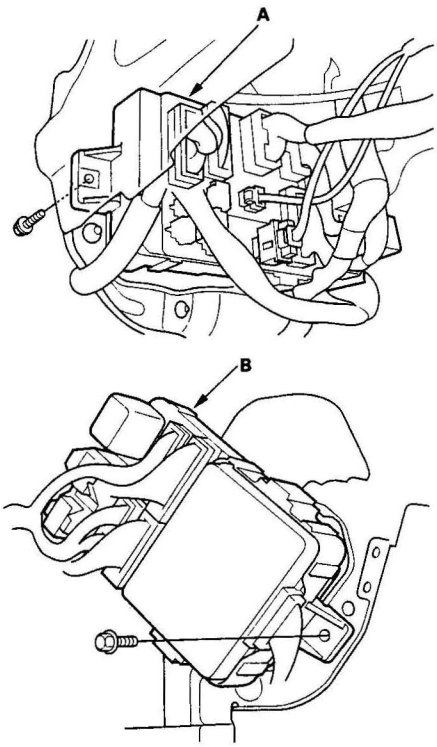
Under-dash Fuse/Relay Box

Removal and Installation

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or servicing (see page 23-17).

Removal

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least 3 minutes.
3. Remove the driver's dashboard lower cover (see page 20-65) or the passenger's dashboard lower cover (see page 20-65).
4. Remove the door sill molding, left or right kick panel (see page 20-55) and left dashboard side cover (see step 1 on page 20-65) or right dashboard side cover (see step 5 on page 20-67).
5. Remove the mounting bolt, and pull the driver's under-dash fuse/relay box (A) or passenger's under-dash fuse/relay box (B) away from the body.



6. Disconnect the driver's or passenger's under-dash fuse/relay box connectors, and remove the driver's or passenger's under-dash fuse/relay box.

   NOTE: The SRS main harness connector is a spring-loaded lock type (see page 23-17).

Installation

1. Connect the connectors to the driver's or passenger's under-dash fuse/relay box, then install the driver's or passenger's under-dash fuse/relay box in the reverse order of removal.
2. Install the left or right kick panel and access panel, and the door sill molding.
3. Install the dashboard lower cover.
4. Connect both the negative cable and positive cable to the battery, enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.
5. Confirm that all systems work properly.

Protected by AR

Battery Test

⚠ WARNING

A battery can explode if you do not follow the proper procedure, causing serious injury to anyone nearby. Follow all procedures carefully and keep sparks and open flames away from the battery.

Use either a JCI or Bear ARBST tester, and follow the manufacturer's procedures. If you don't have one of these computerized testers, follow this conventional test procedure:

1. Be sure the temperature of the electrolyte is between 70°F (21°C) and 100°F (38°C).
2. Inspect the battery case for cracks or leaks.
   - If the case is damaged, replace the battery. ■
   - If the case looks OK, go to step 3.
3. Check the indicator EYE.
   - If the EYE indicates the battery is charged, go to step 4.
   - If the EYE indicates a low charge, go to step 7.
4. Apply a 300 amp load for 15 seconds to remove the surface charge.
5. Wait 15 seconds, then apply a test load of 280 amps for 15 seconds.
6. Record battery voltage.
   - If voltage is above 9.6 volts, the battery is OK. ■
   - If voltage is below 9.6 volts, go to step 7.
7. Charge the battery on High (40 amps) until the EYE shows the battery is charged, plus an additional 30 minutes. If the battery charge is very low, it may be necessary to bypass the charger's polarity protection circuitry.
   - If the EYE indicates the battery is charged within 3 hours, the battery is OK. ■
   - If the EYE indicates the battery is not charged within 3 hours, replace the battery. ■

BACK

Protected by AR

Power Relay Test

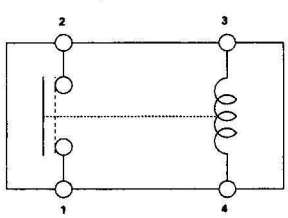
Use this chart to identify the type of relay, then do the test listed for it.
NOTE The turn signal/hazard relay input test (see page 22-176).

Relay	Test
ABS fail-safe relay	Normally-open type A
Accessory power socket relay	
A/C compressor clutch relay	
Condenser fan relay	
Fog light relay ('02-03 models)	
Headlight relay 1	
Headlight relay 2	
High beam cut relay (Canada)	
Horn relay	
Navigation relay ('99 model)	
Power window relay	
Radiator fan relay	
Reverse relay	
Seat heater relay	
Security horn relay ('99 model)	
Starter cut relay	
Taillight relay	
TCS relay	
VSA relay (TYPE S)	
VSA throttle motor relay (TYPE S)	
ABS pump motor relay	Normally-open type B
Blower motor relay, type 1	
Blower motor relay, type 2	
Rear window defogger relay	
Windshield wiper intermittent relay	Five terminal type A
Fan control relay (TYPE S)	Five terminal type B
Moonroof open and close relays	
Shift lock relay	

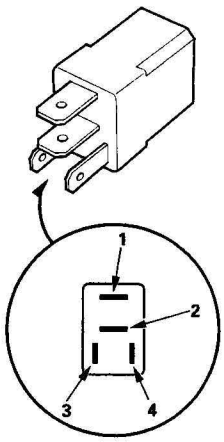
Normally-open type A:

Check for continuity between the terminals.

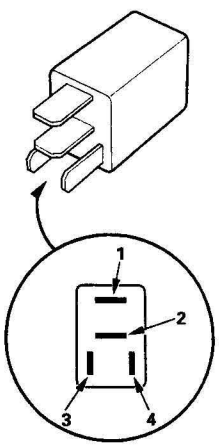
- There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals.
- There should be no continuity between the No. 1 and No. 2 terminals when power is disconnected.



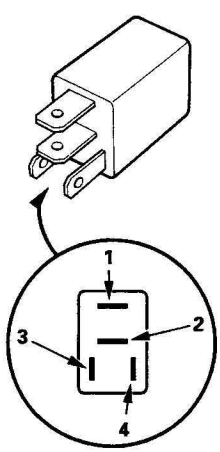
type 1:



type 2:



type 3:



(cont'd)

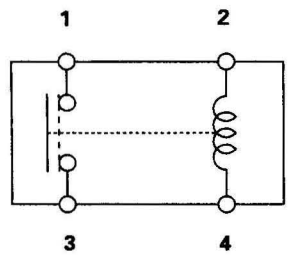
Protected by AR

Power Relay Test (cont'd)

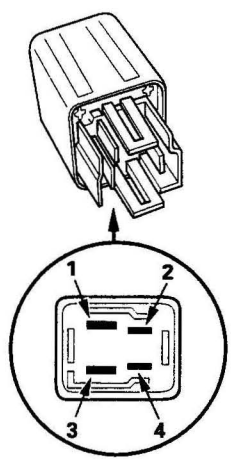
Normally-open type B:

Check for continuity between the terminals.

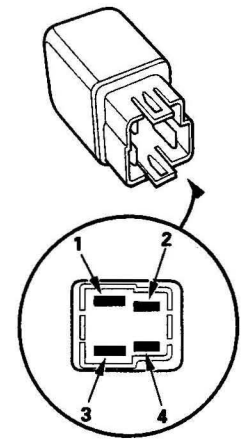
- There should be continuity between the No. 1 and No. 3 terminals when power and ground are connected to the No. 2 and No. 4 terminals.
- There should be no continuity between the No. 1 and No. 3 terminals when power is disconnected.



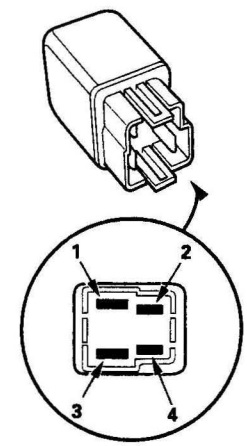
Rear window defogger relay



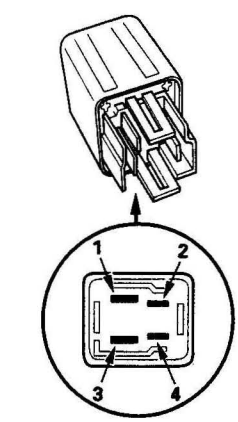
ABS pump motor relay



Blower motor relay, type 1:



Blower motor relay, type 2:



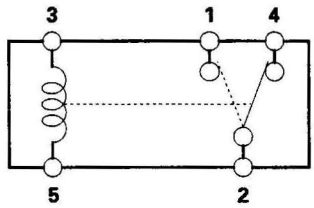
BACK

Protected by AR

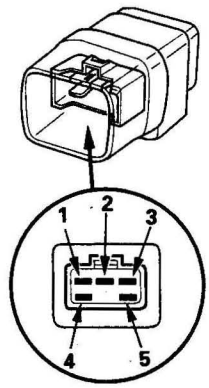
Five-terminal type A:

Check for continuity between the terminals.

- There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 5 terminals.
- There should be continuity between the No. 2 and No. 4 terminals when power is disconnected.



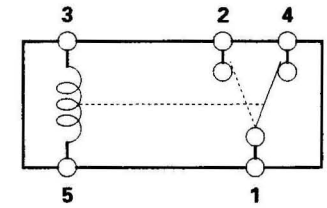
Windshield wiper intermittent relay



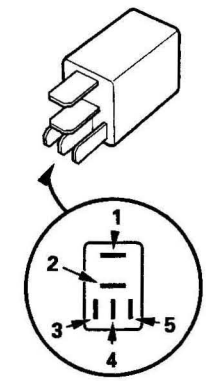
Five-terminal type B:

Check for continuity between the terminals.

- There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 5 terminals.
- There should be continuity between the No. 1 and No. 4 terminals when power is disconnected.



- **Fan control relay**
- **Moonroof open and close relays**
- **Shift lock relay**

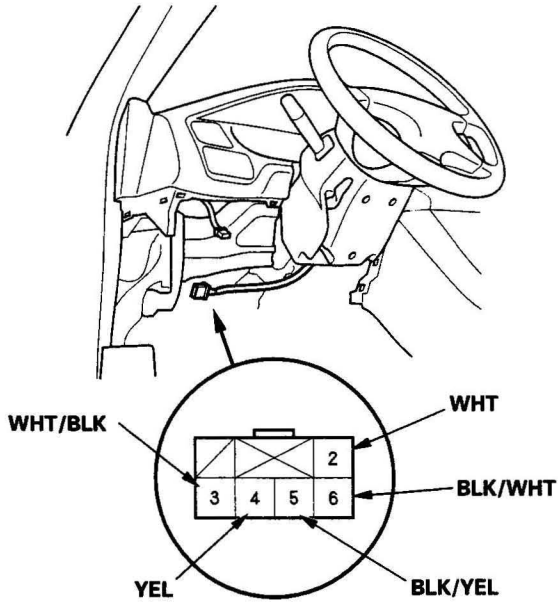


Protected by AR

Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-17).

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable.
3. Remove the dashboard lower cover (see page 20-65)
4. Disconnect the 6P connector from the driver's under-dash fuse/relay box.



Wire side of female terminals

5. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	WHT/ BLK (ACC)	WHT (BAT)	BLK/ YEL (IG1)	YEL (IG2)	BLK/ WHT (ST)
0 (LOCK)					
I (ACC)	○—○				
II (ON)	○—○	○—○	○—○		
III (START)		○—○	○—○	○—○	

6. If the continuity checks do not agree with the table, replace the ignition switch.
7. After reconnecting the battery, enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

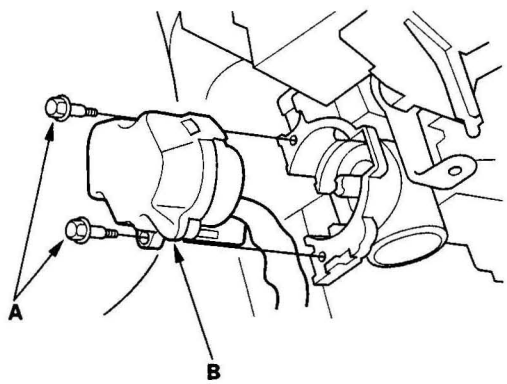
BACK

Protected by AR

Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section before performing repairs or service (see page 23-17).

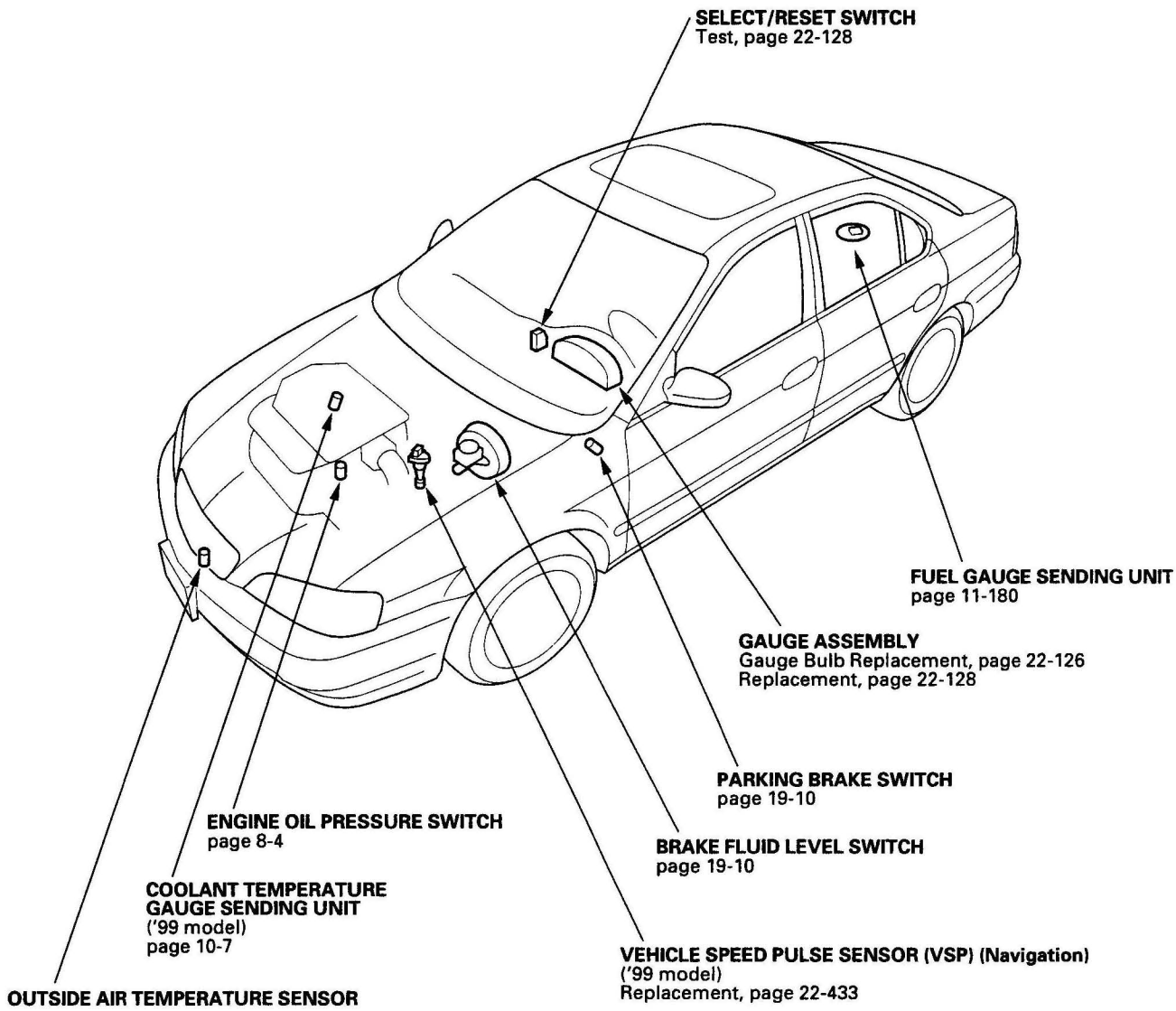
1. Make sure you have the anti-theft codes for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable.
3. Remove the steering column covers (see page 17-27)
4. Insert the ignition key, and turn it to "0".
5. Remove the screws (A), and replace the electrical switch (B).



6. Install the switch in the reverse order of removal.
7. After reconnecting the battery, enter the anti-theft codes for the radio and the navigation system, then enter the customer's radio station presets.

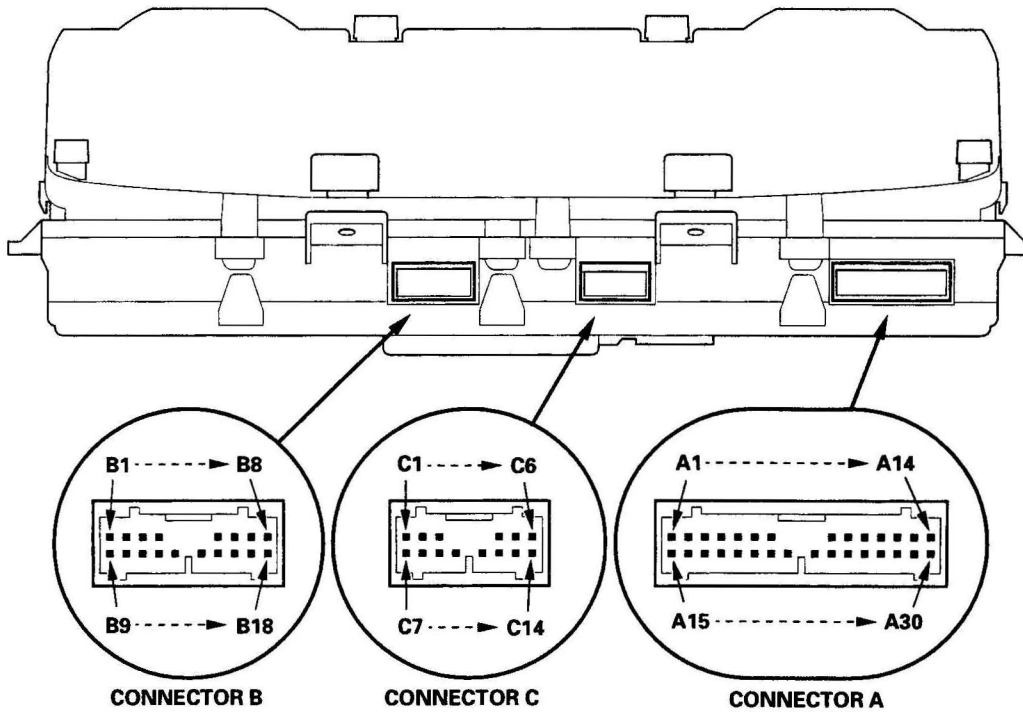
Protected by AR

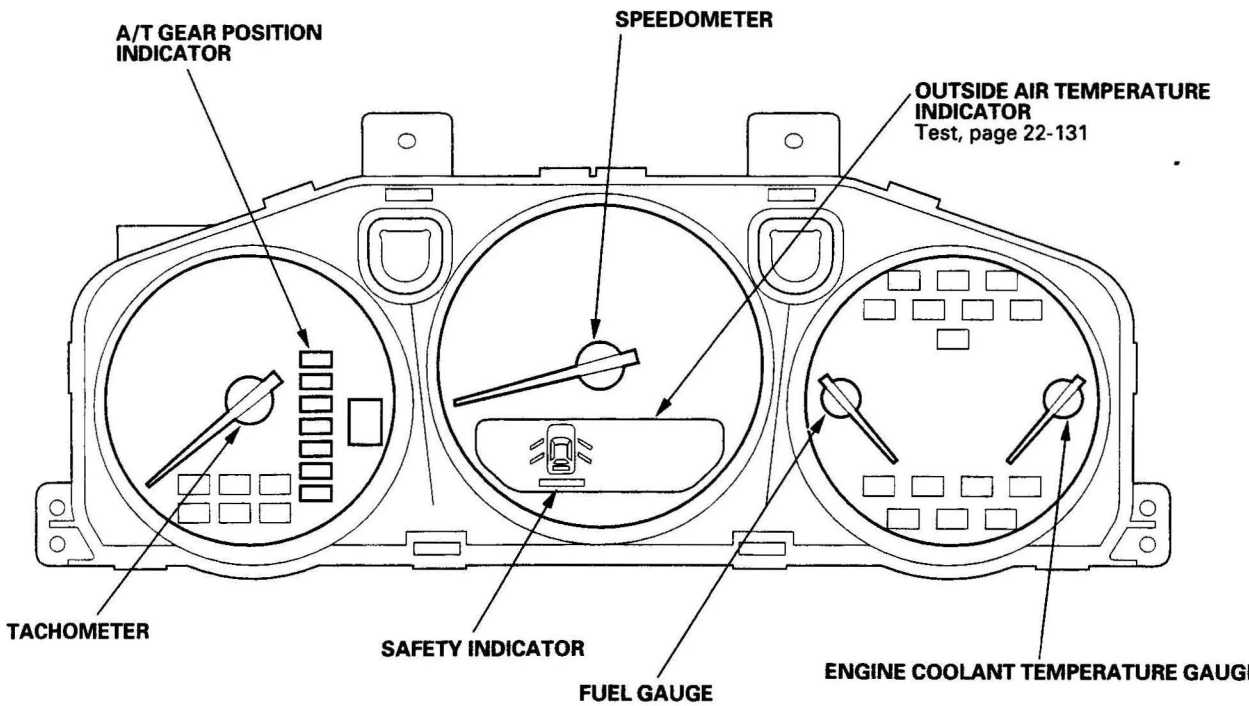
Component Location Index



BACK

Protected by AR

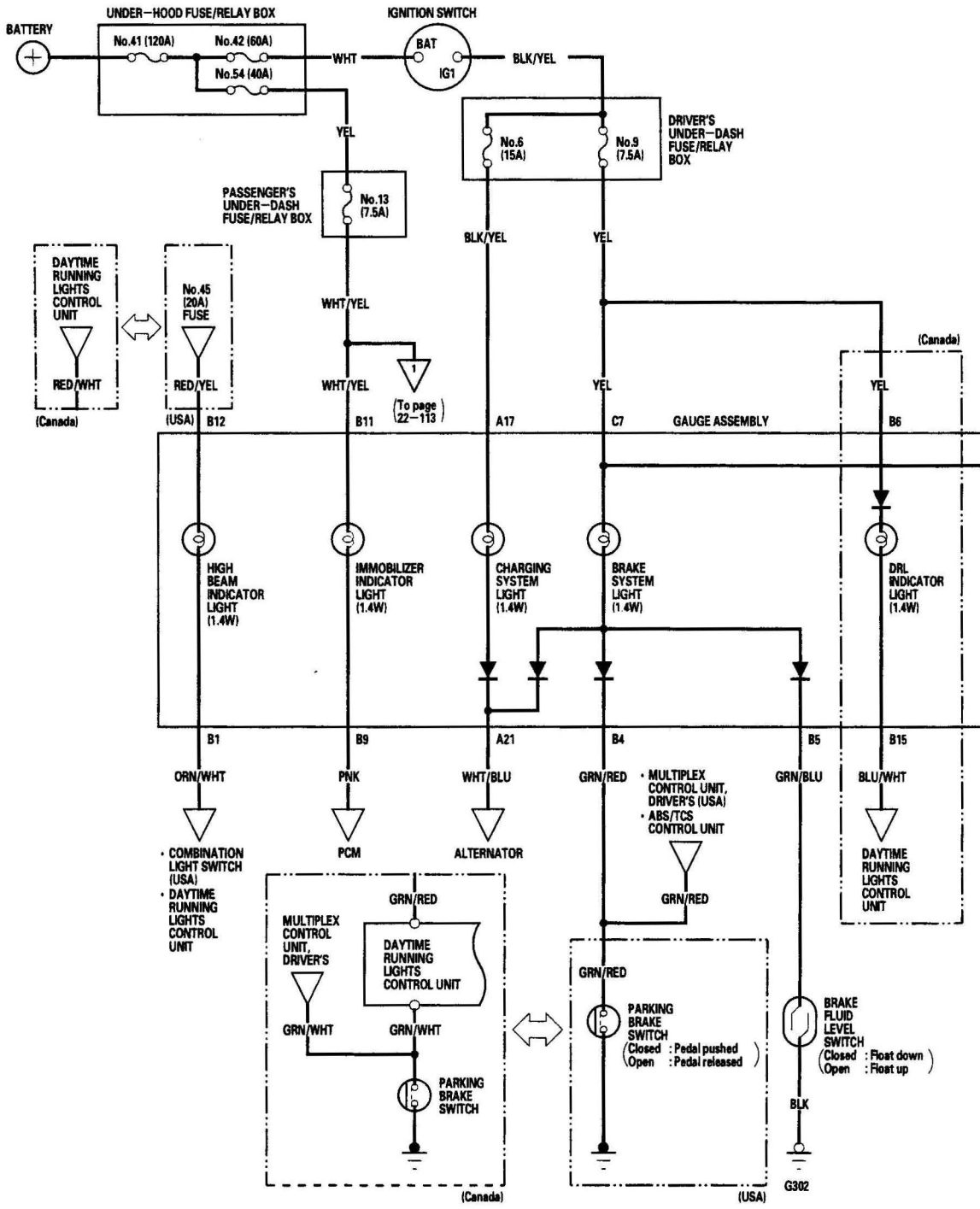




Protected by AR

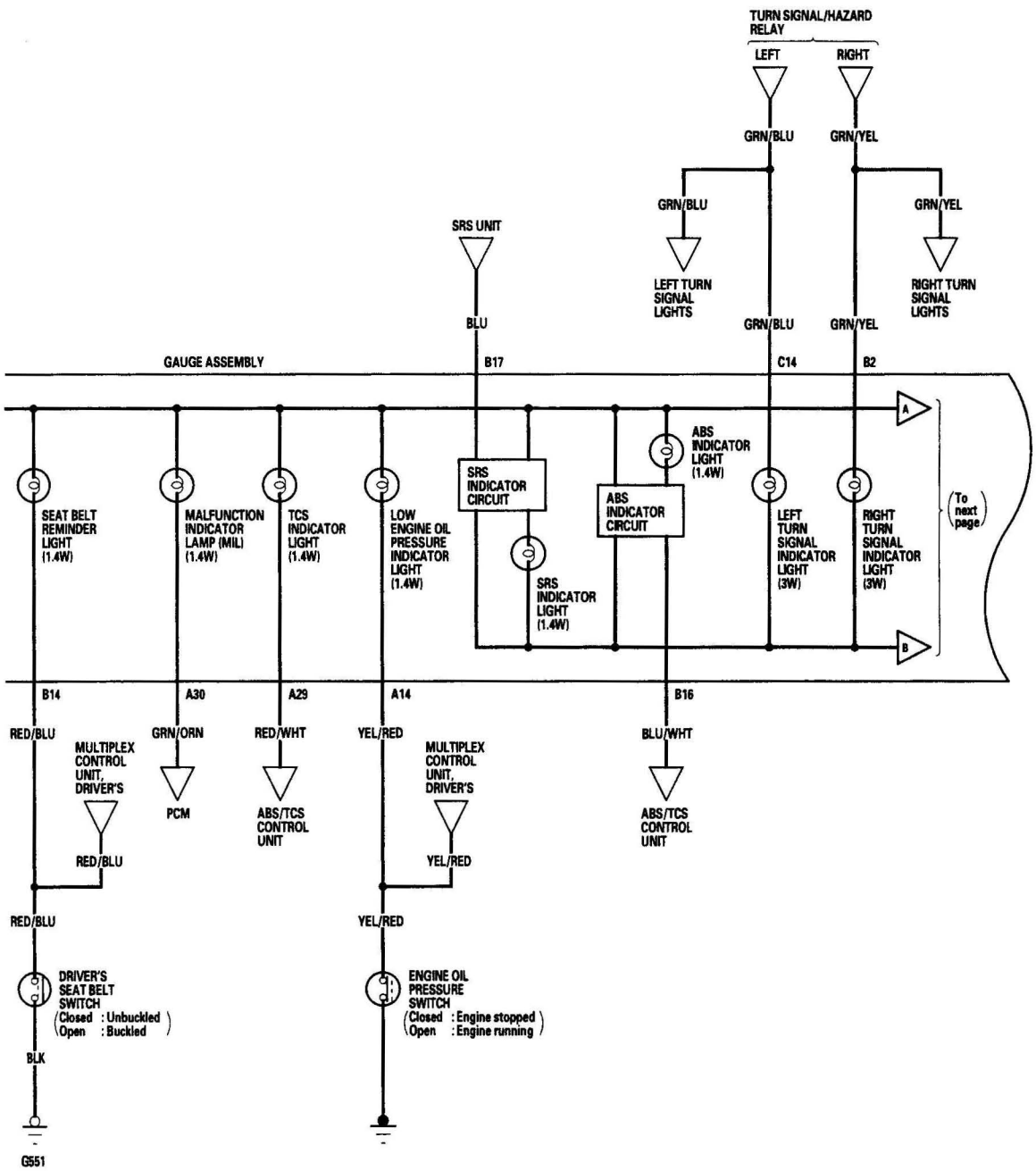
Circuit Diagram

'99 Model



BACK

Protected by AR

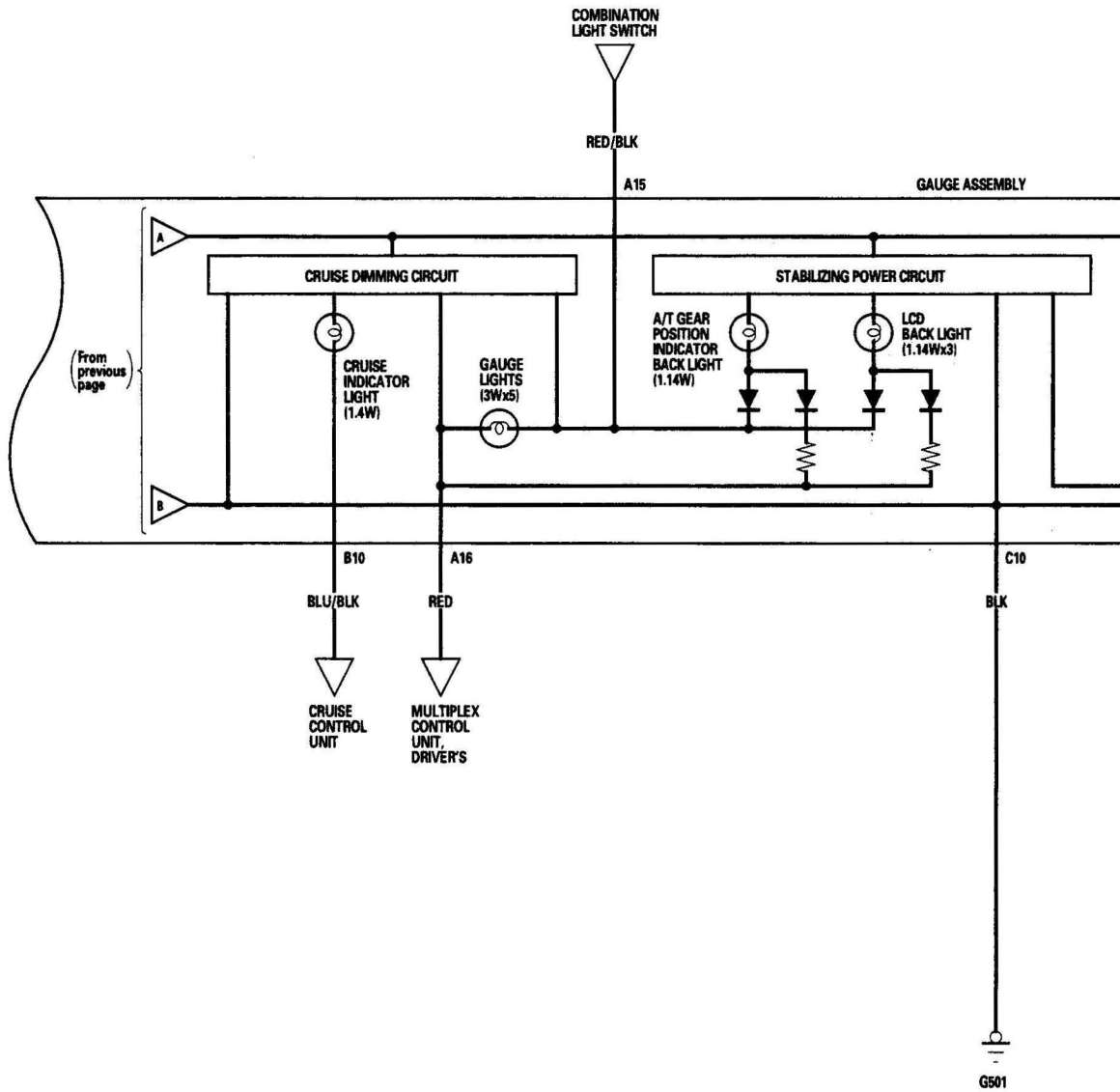


(cont'd)

BACK

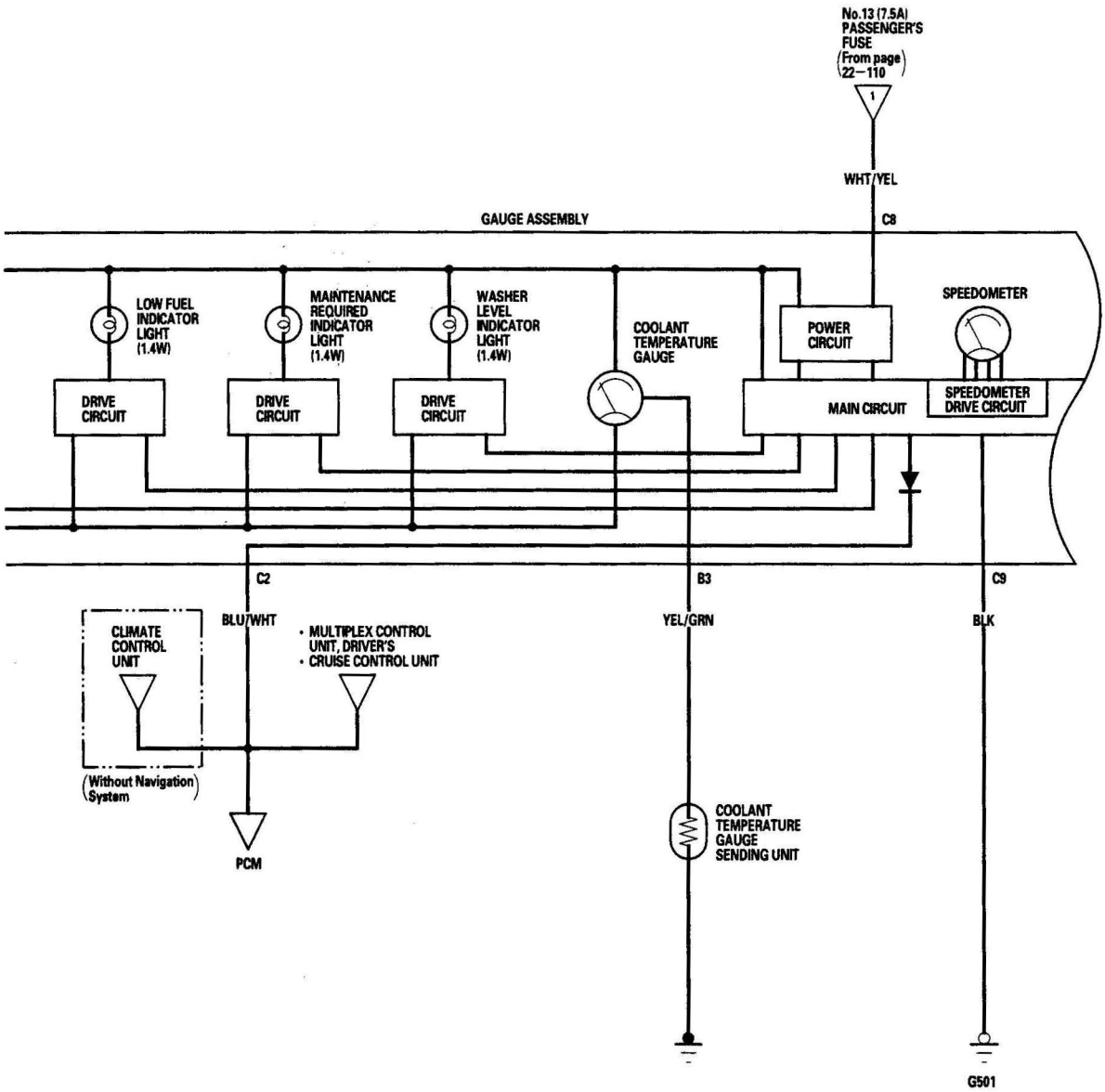
Protected by AR

Circuit Diagram (cont'd)



BACK

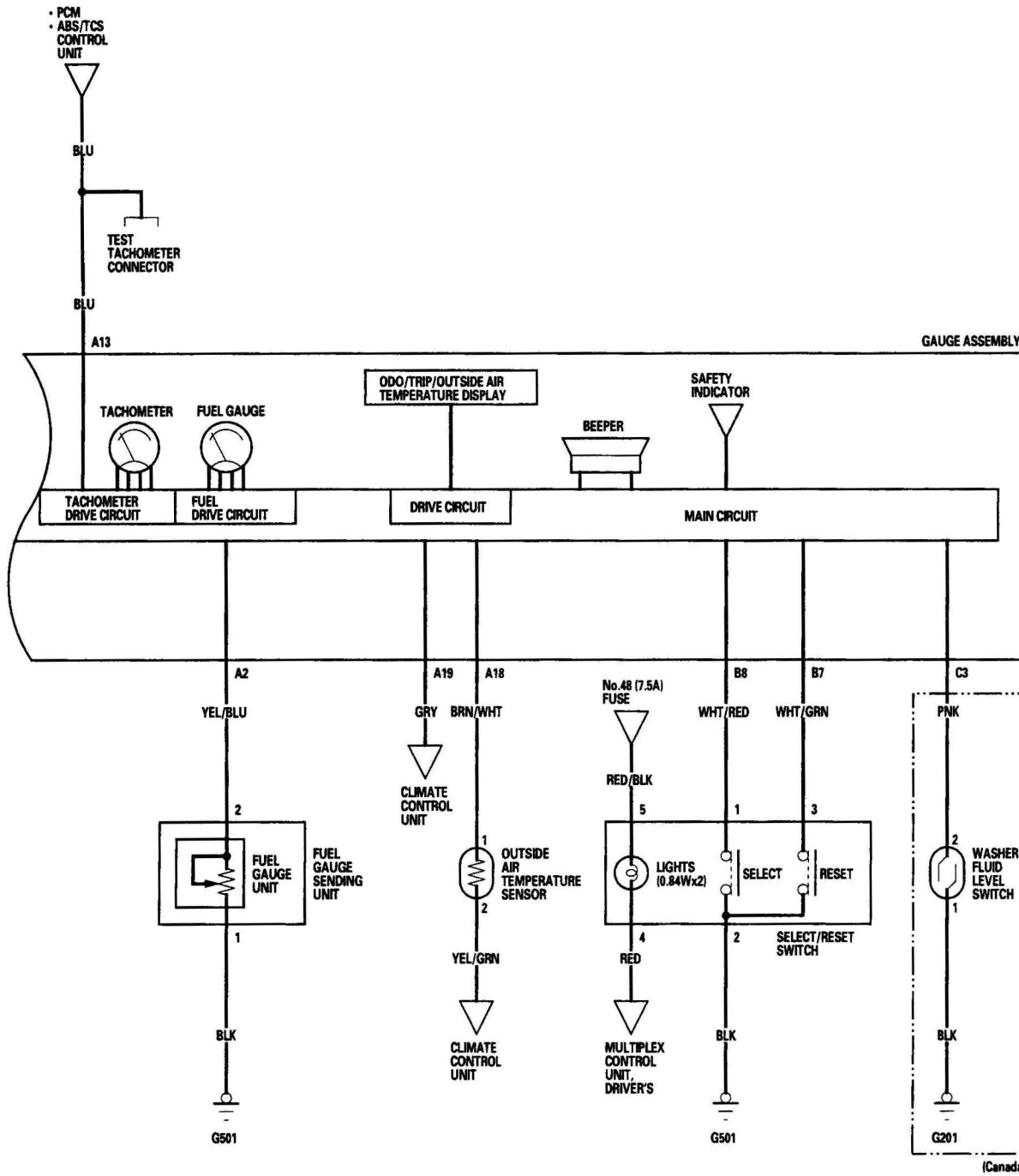
Protected by AR



(cont'd)

Protected by AR

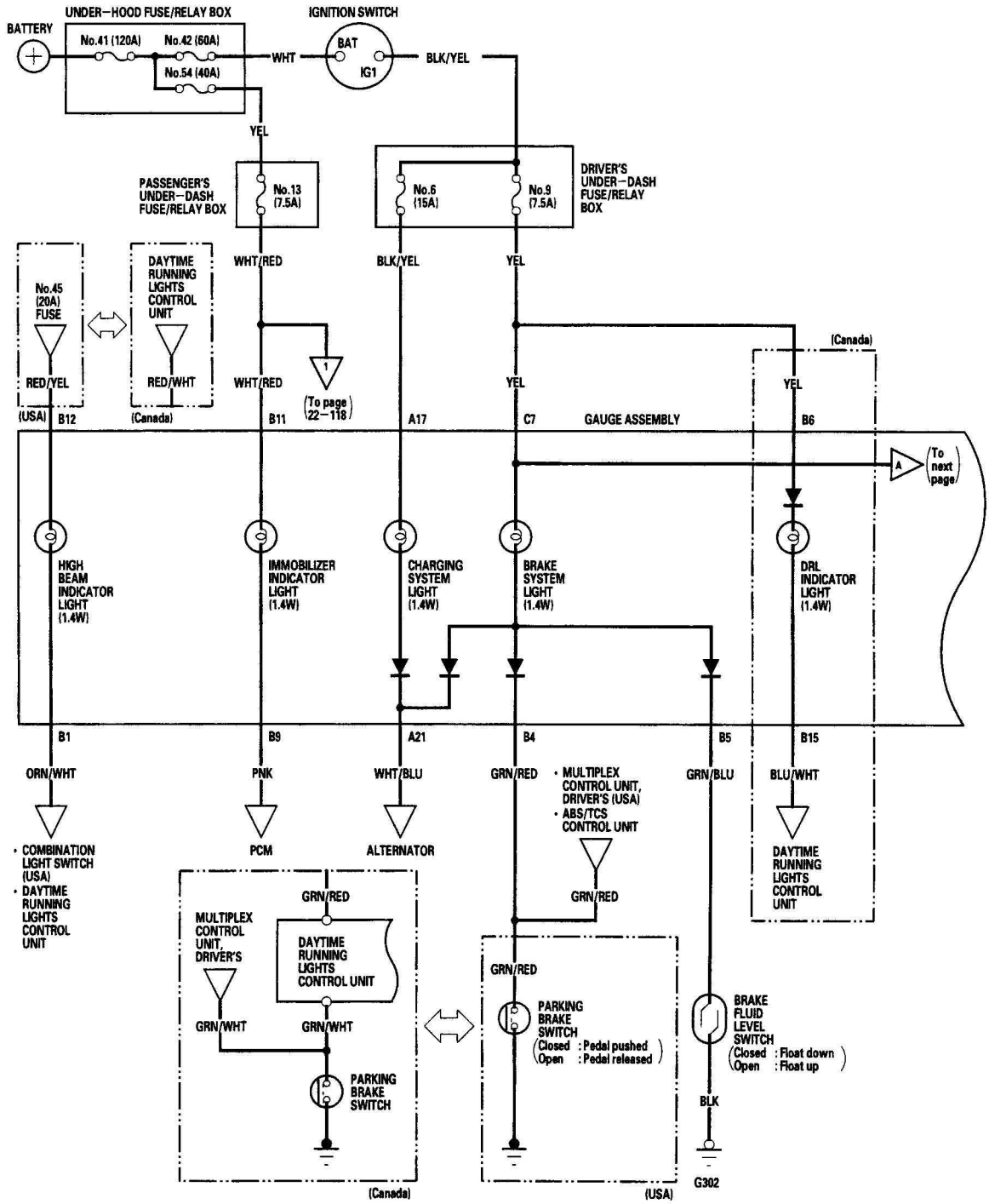
Circuit Diagram (cont'd)



BACK

Protected by AR

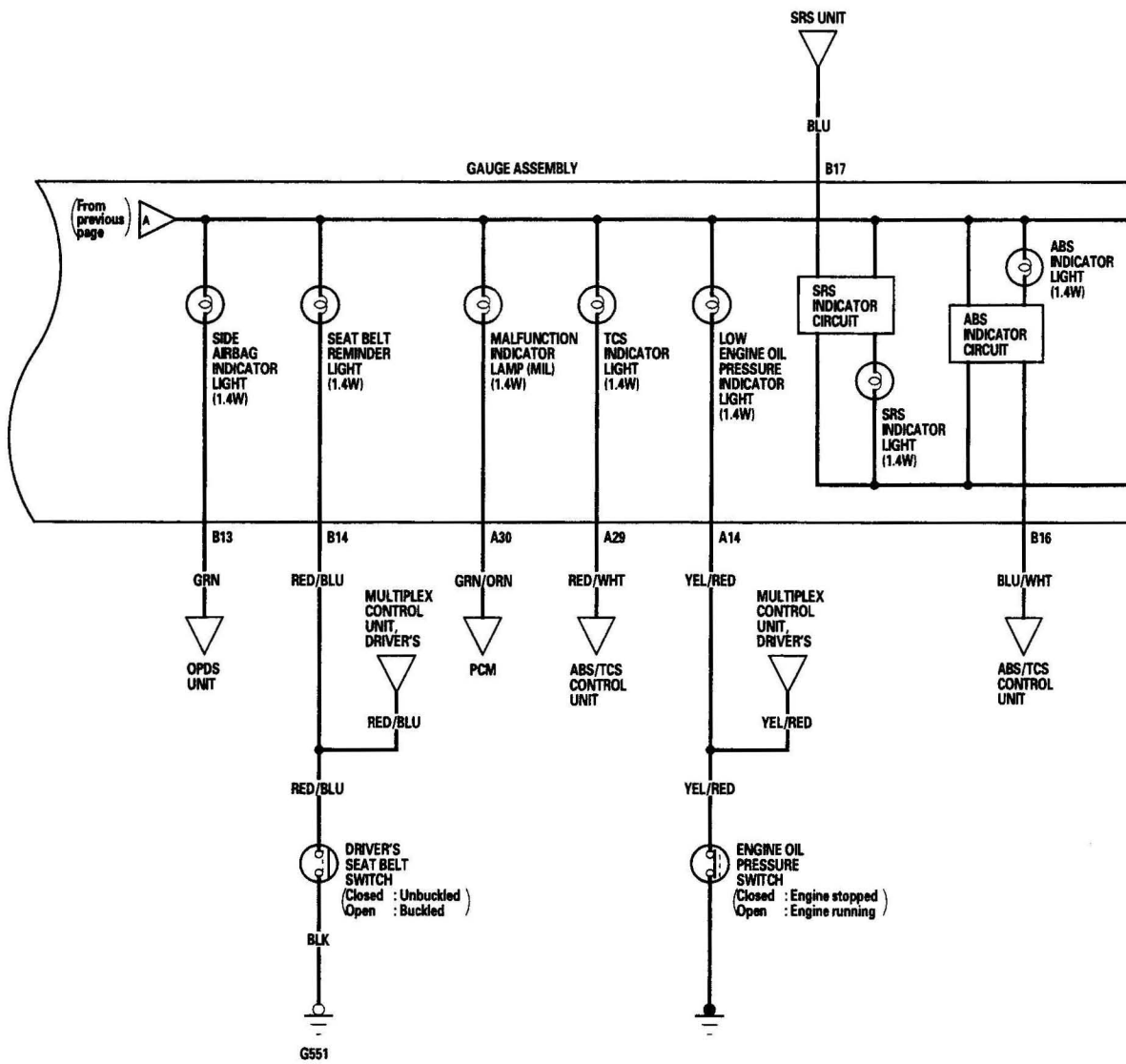
'00-01 Models



(cont'd)

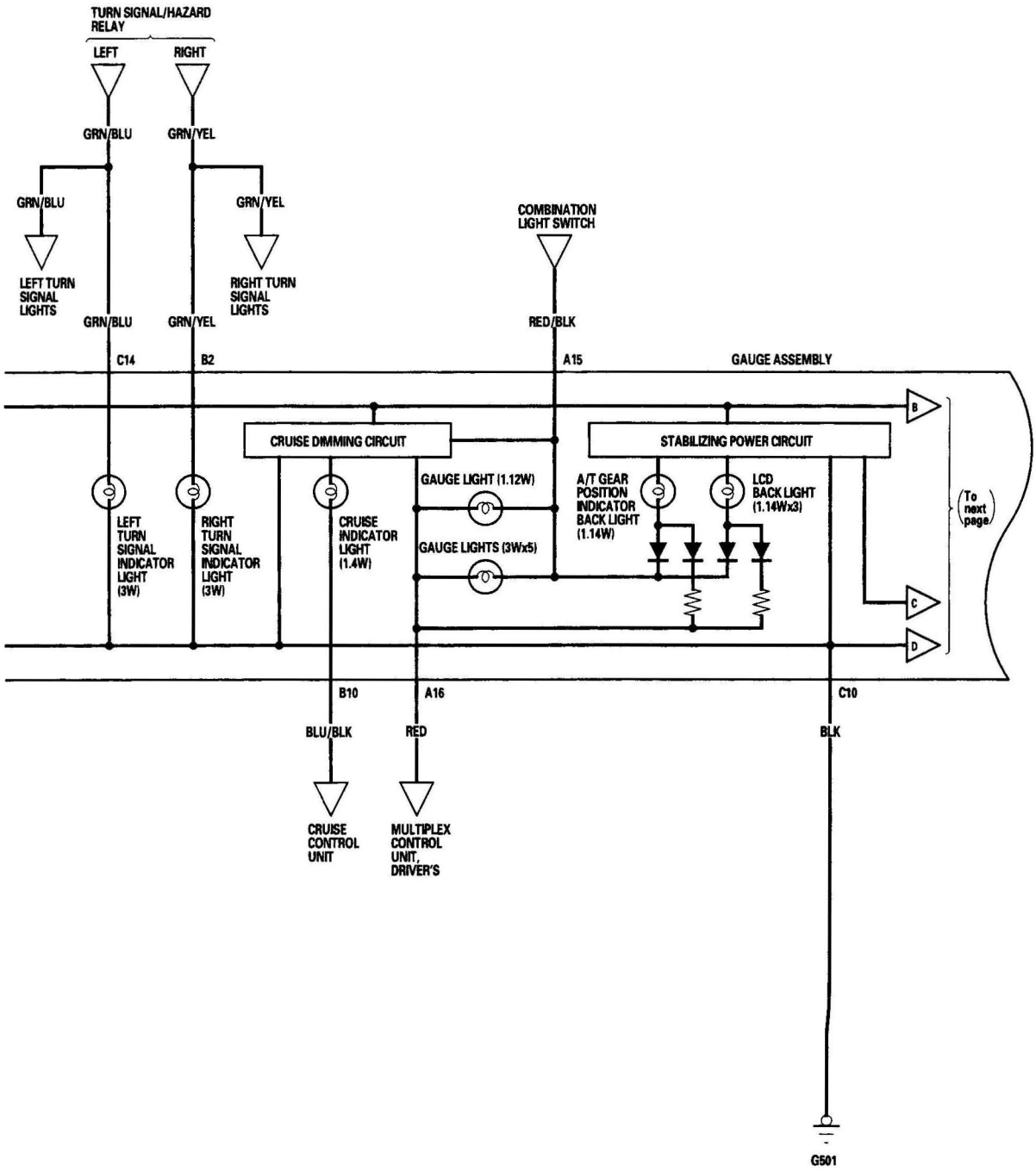
Protected by AR

Circuit Diagram (cont'd)



BACK

Protected by AR

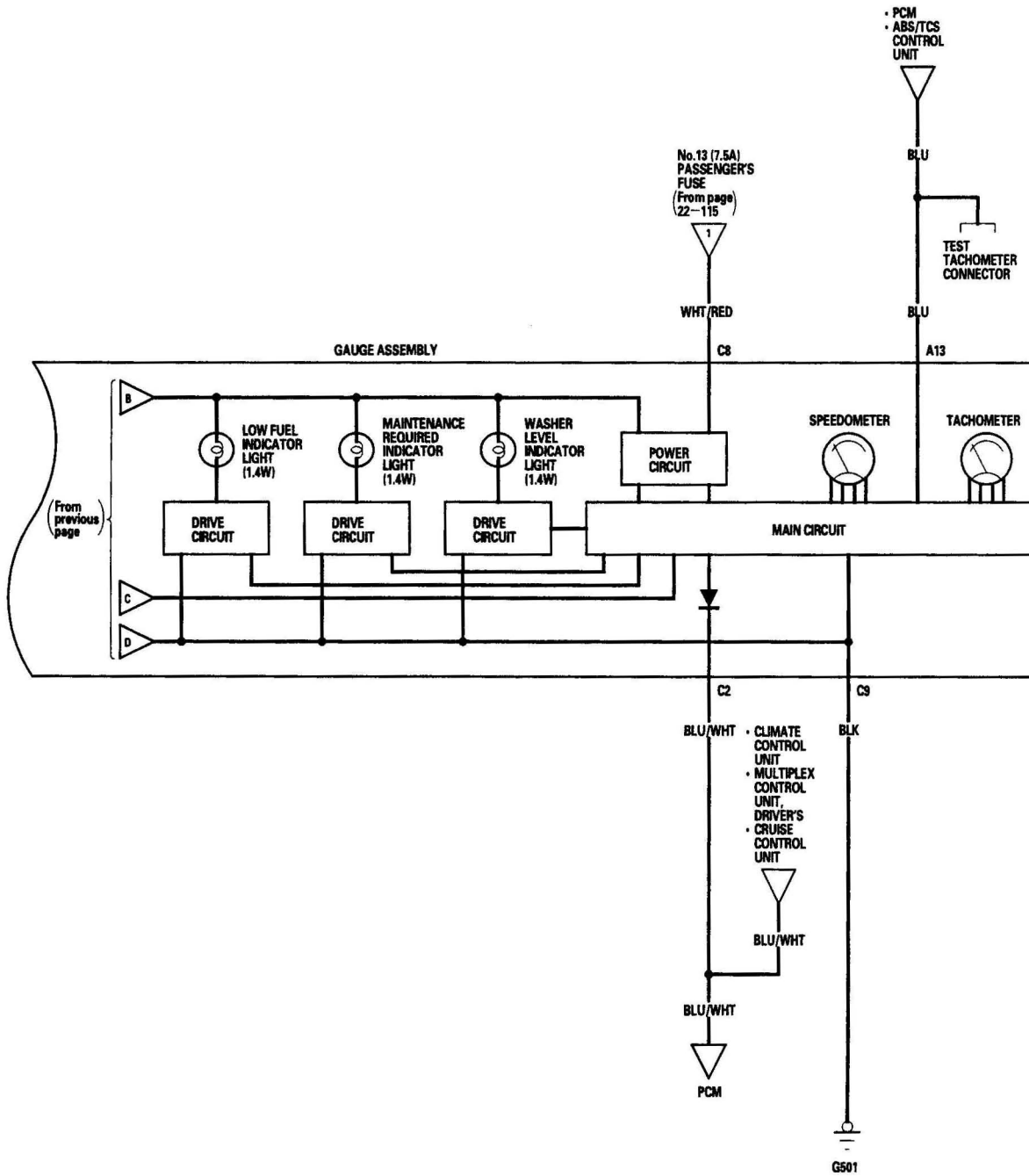


(cont'd)

BACK

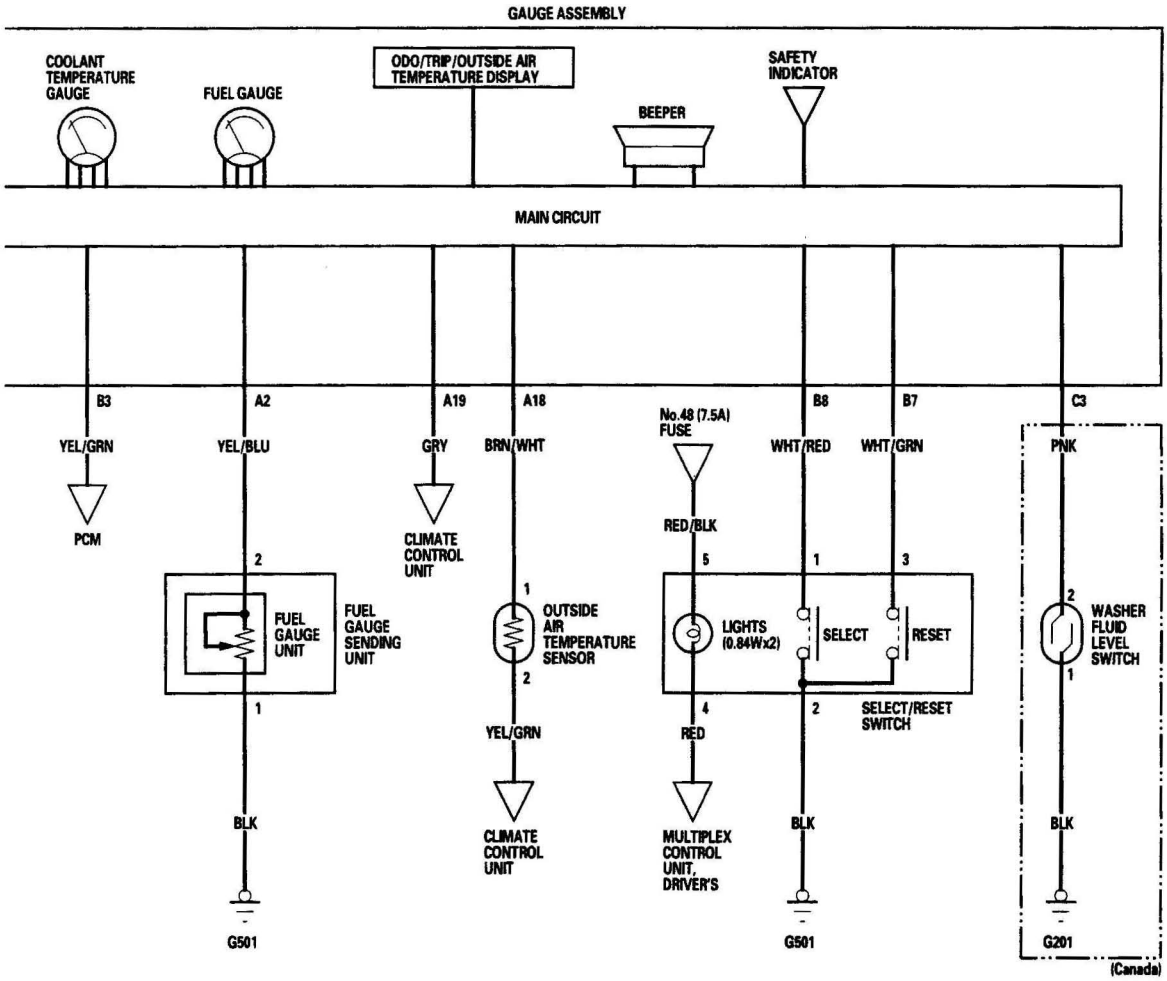
Protected by AR

Circuit Diagram (cont'd)



BACK

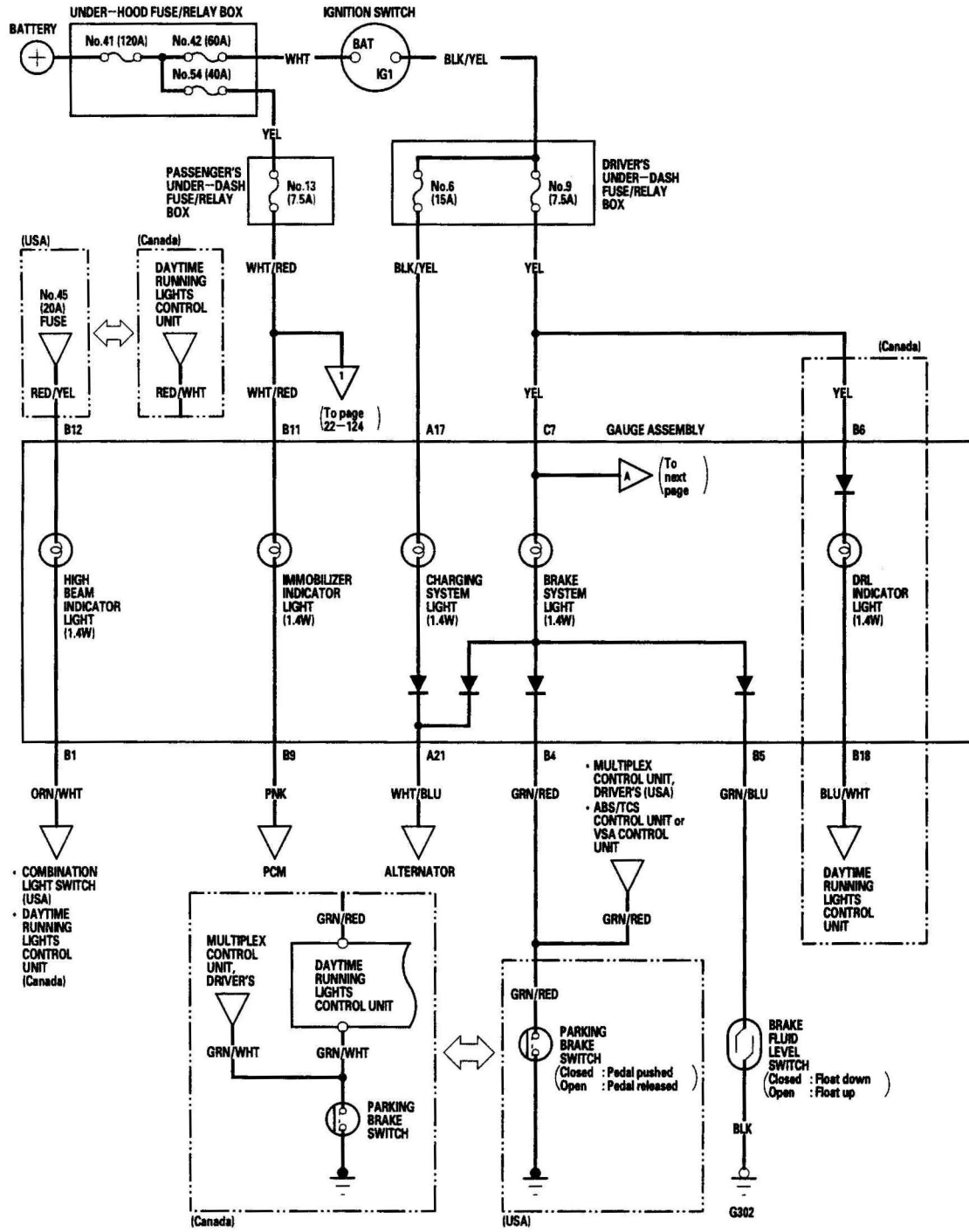
Protected by AR



Protected by AR

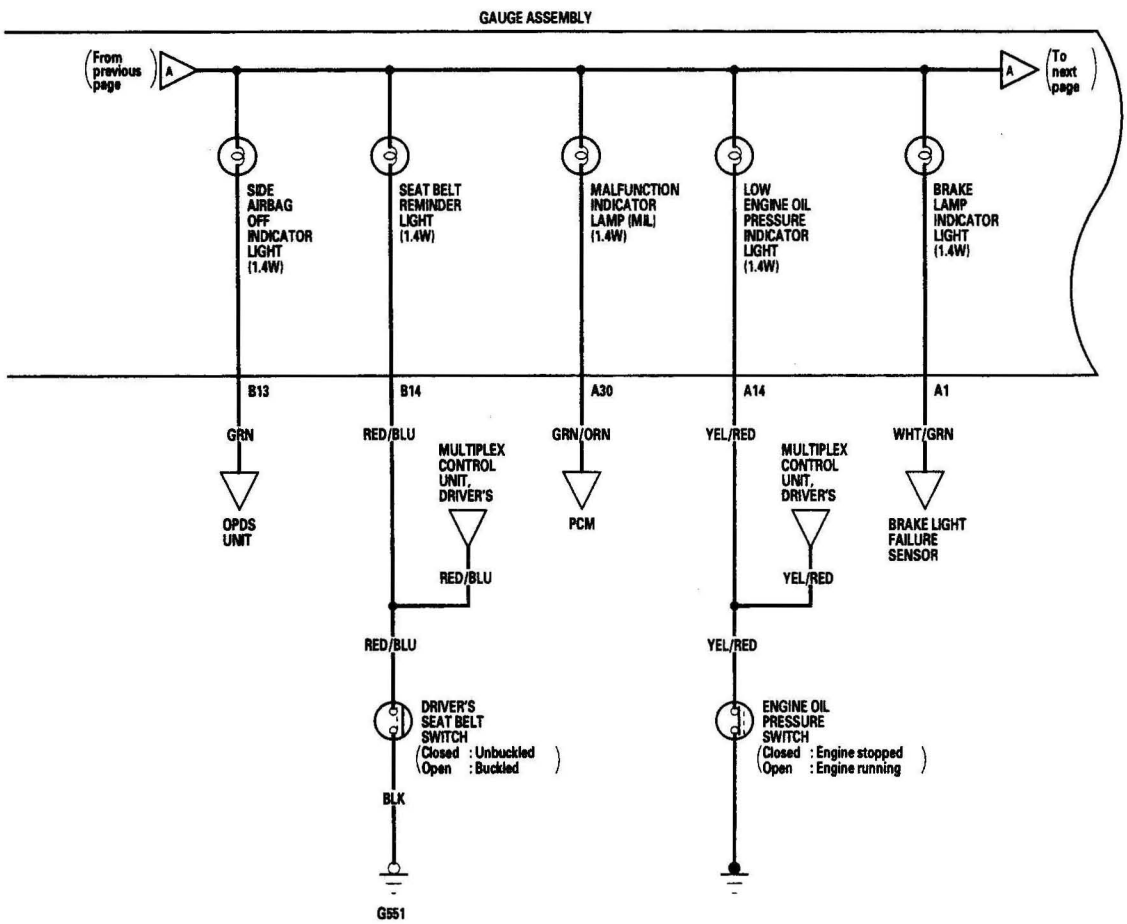
Circuit Diagram (cont'd)

'02-03 Models



BACK

Protected by AR

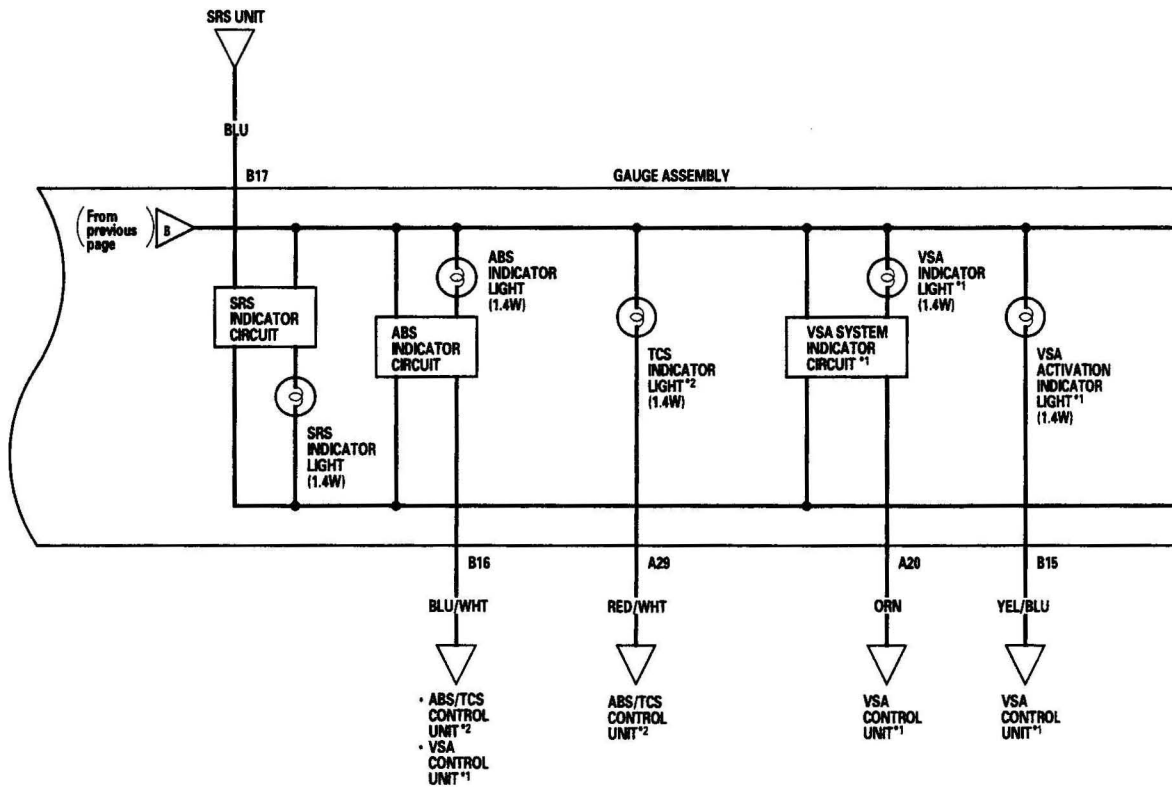


(cont'd)

BACK

Protected by AR

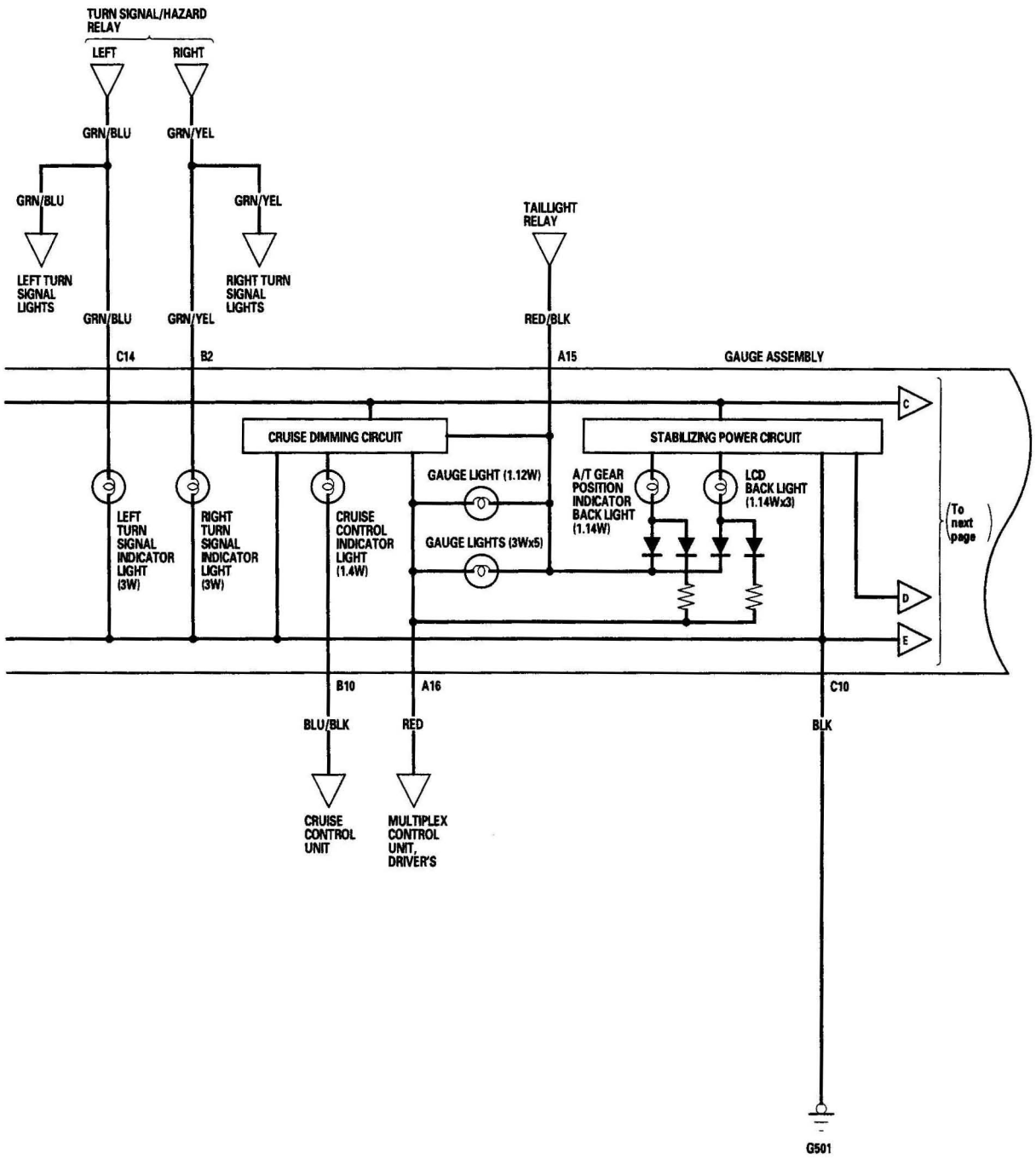
Circuit Diagram (cont'd)



BACK

Protected by AR

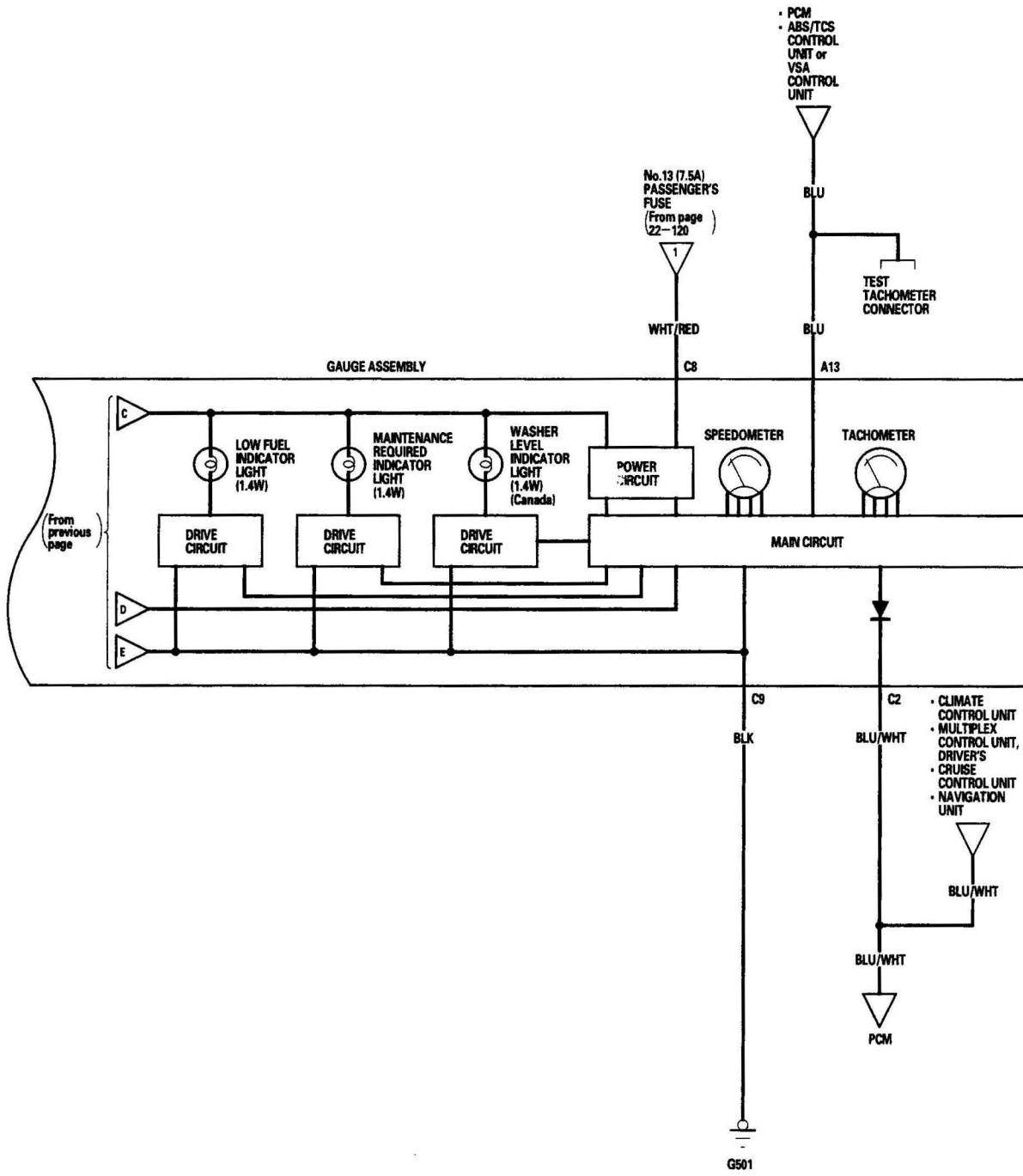
*1 : TYPE S
*2 : PREMIUM



(cont'd)

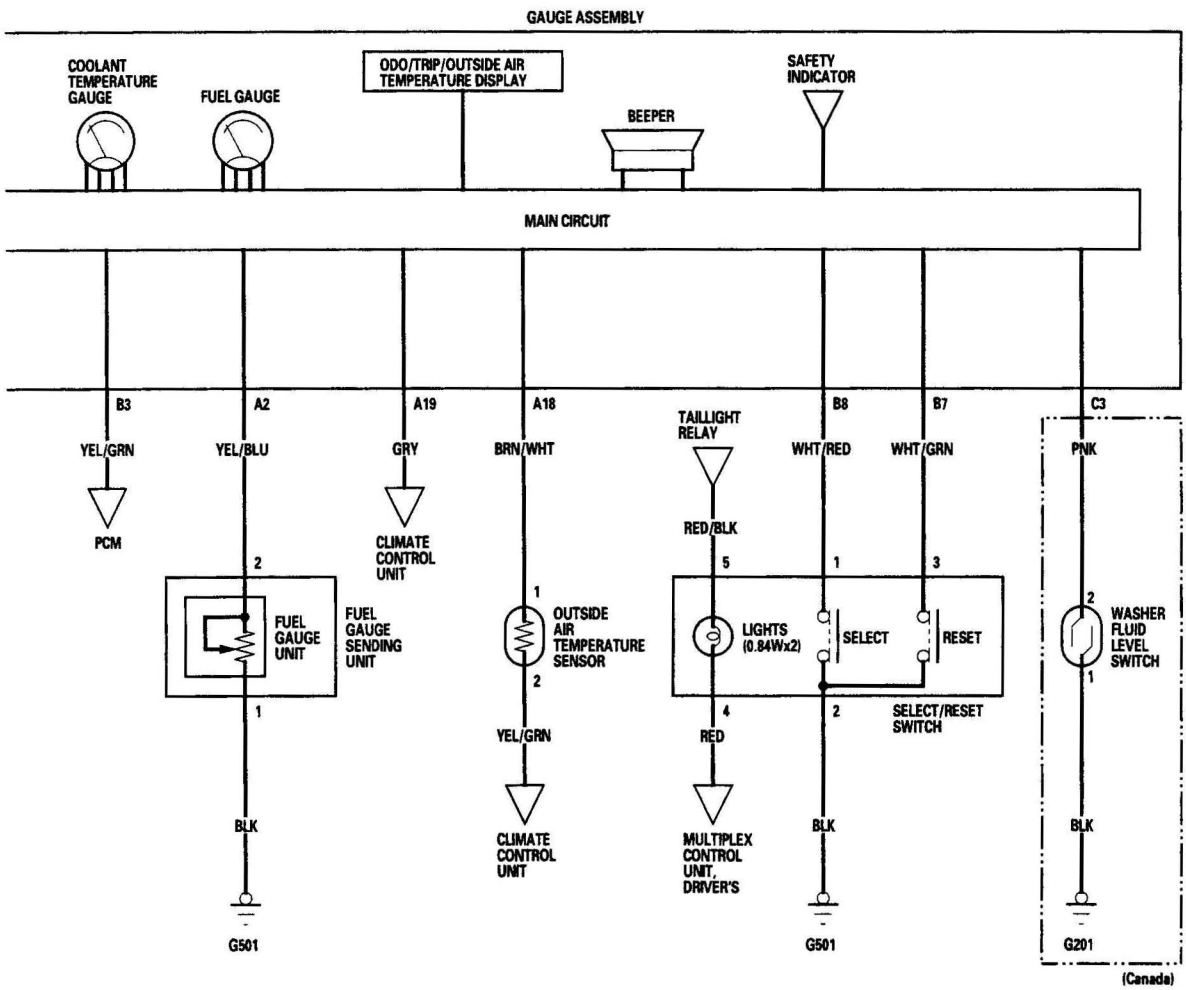
Protected by AR

Circuit Diagram (cont'd)



BACK

Protected by AR

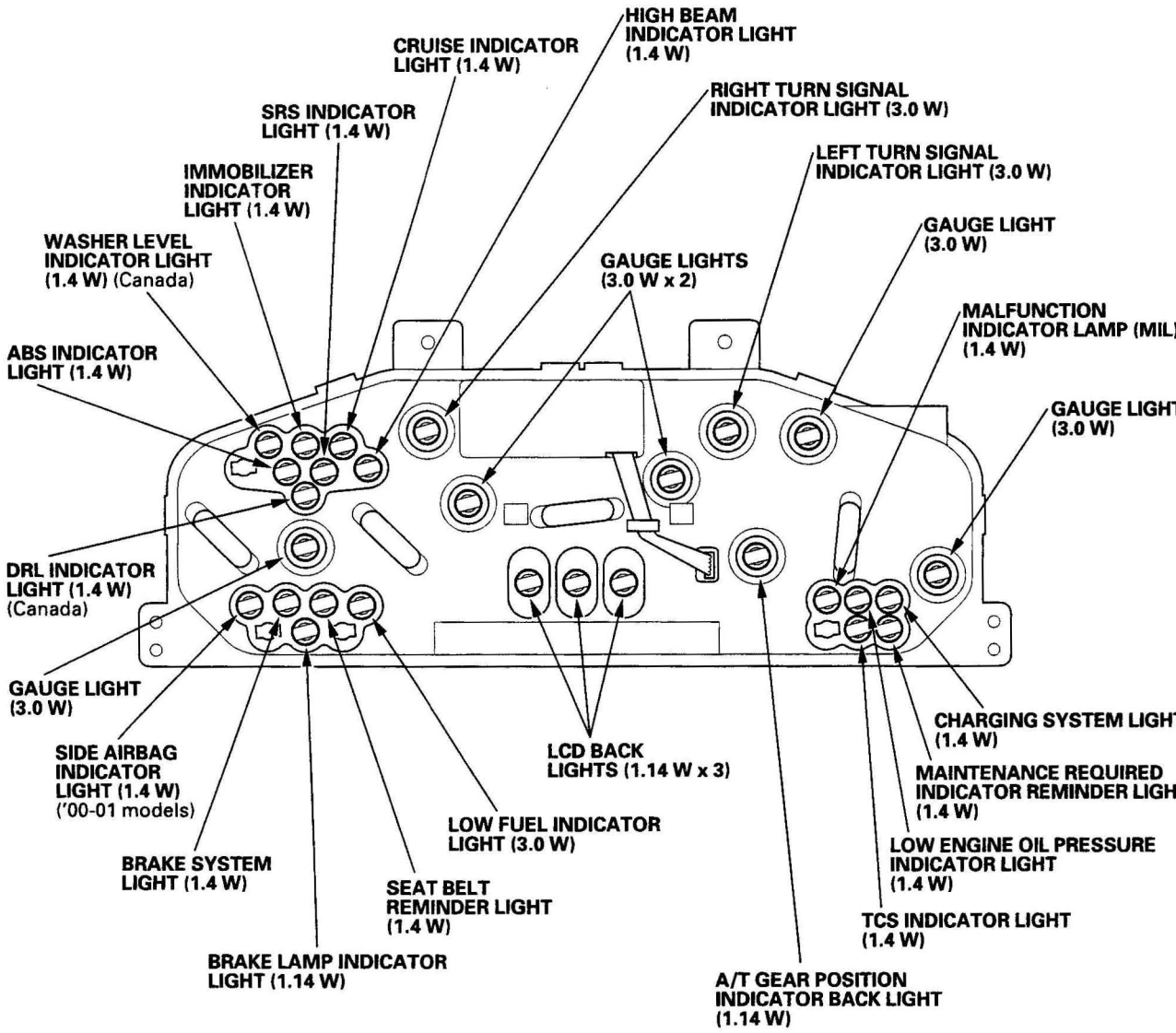


BACK

Protected by AR

Gauge Bulb Replacement

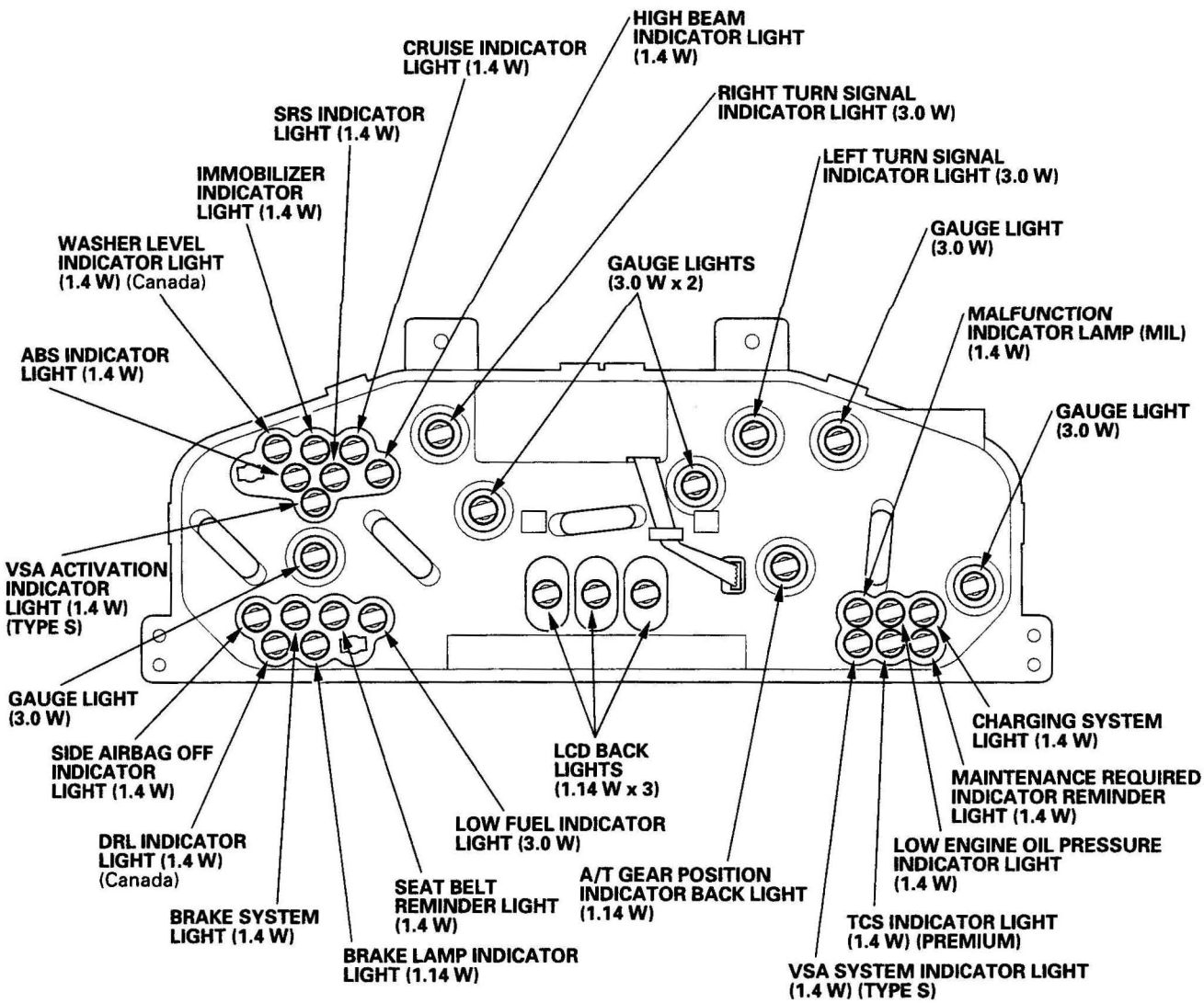
Exploded View ('99-01 Models)



BACK

Protected by AR

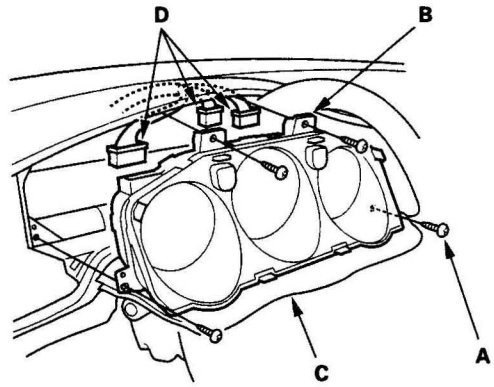
Exploded View ('02-03 Models)



Protected by AR

Gauge Assembly Replacement

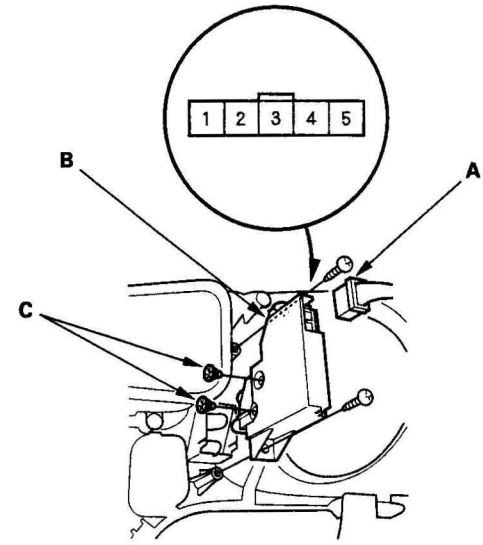
1. Remove the instrument panel (see page 20-65).
2. Remove the screws (A) from the gauge assembly (B), and spread a protective cloth (C) on the upper column cover.



3. Disconnect the connectors (D), and remove the gauge assembly.
4. Install in the reverse order of removal.

Select/Reset Switch Test

1. Remove the instrument panel (see page 20-65).
2. Disconnect the 5P connector (A) from the select/reset switch (B).



3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	1	2	3	4		5
OFF						
SELECT switch ON	○	○		○	○	○
RESET switch ON		○	○			

4. If the continuity checks do not agree with the table, remove the two screws, and replace the bulbs (C) or the switch.

BACK

Protected by AR

Vehicle Speed Signal Circuit Troubleshooting

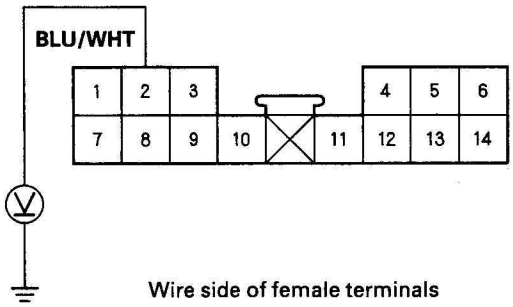
Before testing:
- '99 model: Check to see if diagnostic trouble code P0720 (9) is indicated. If it is, troubleshoot the DTC (see page 14-70).
- '00-03 models: Check to see if diagnostic trouble code P0720 (9) is indicated. If it is, troubleshoot the DTC (see page 14-297).
- Inspect the No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box.
- Check for continuity between the C9 and C10 terminals and body ground (G501).

1. Raise the vehicle, and make sure it is securely supported.

2. Disconnect the 14P connector from the gauge assembly.

3. Connect the C2 terminal to the positive probe of a voltmeter, and connect the negative probe to body ground. To prevent damage to the gauge assembly, lay the gauge assembly on a shop rag.

DASHBOARD WIRE HARNESS 14P CONNECTOR C



Wire side of female terminals

4. Put the vehicle in neutral with the ignition switch ON (II).

5. Slowly rotate (over 3 mph (2 km/h)) one wheel with the other wheel blocked.

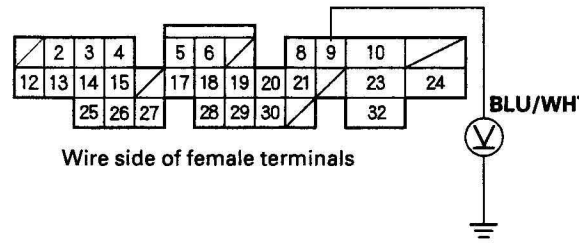
   Does voltage pulse from 0 to about 5 V or more?

   YES – Replace the gauge assembly.■

   NO – Go to step 6.

6. Connect the No. 9 terminal of the 32P PCM connector to the positive probe of a voltmeter, and connect the negative probe to body ground.

PCM 32P CONNECTOR (Connected)



Wire side of female terminals

7. Put the vehicle in neutral with the ignition switch ON (II).

8. Slowly rotate (over 3 mph (2 km/h)) one wheel with the other wheel blocked.

   Does voltage pulse from 0 to about 5 V or more?

   YES – Go to step 9.

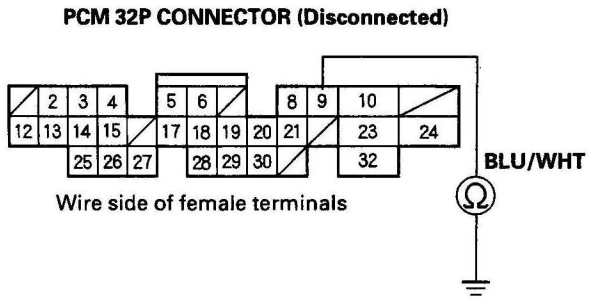
   NO – Repair open in the BLU/WHT wire between the countershaft speed sensor and the PCM, the cruise control unit, or the multiplex control unit, driver's.■

(cont'd)

Protected by AR

Vehicle Speed Signal Circuit Troubleshooting (cont'd)

9. Disconnect the 32P connector from the PCM.
10. Check for continuity between No. 9 terminal and body ground.



Is there continuity?

YES – Repair short to ground in the BLU/WHT wire between the PCM and the gauge assembly, the cruise control unit, or the driver's multiplex control unit. ■

NO – Check for these problems:
- Bent, loose or corroded terminals.
- A faulty PCM. ■

Maintenance Required Indicator Reset Procedure

How to Reset:
Push the select switch and reset switch at the same time, turn the ignition switch ON (II), and hold them more than 10 seconds.

Blinking Pattern:

Miles (km)	Maintenance Reminder Light
At 5,900 (9,440) to 6,100 (9,760)	Blinks for 10 seconds when the ignition switch is turned ON (II).
At 7,400 (11,840) to 7,600 (12,160)	Comes on and stays on while the ignition switch is ON (II).

BACK

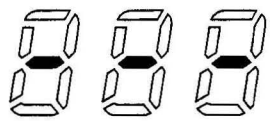
Protected by AR

Outside Air Temperature Indicator Test

NOTE: To test the outside air temperature sensor (see page 21-54).

Troubleshooting:

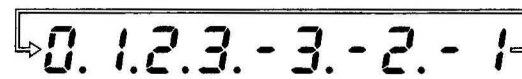
If the indicator displays "888" for more than 2 seconds after selecting the outside air temperature display mode, check for an open in the wire between the gauge and the outside air temperature sensor.



Calibration:

The outside air temperature indicator's displayed temperature can be recalibrated ±3° to meet the customer's expectations.

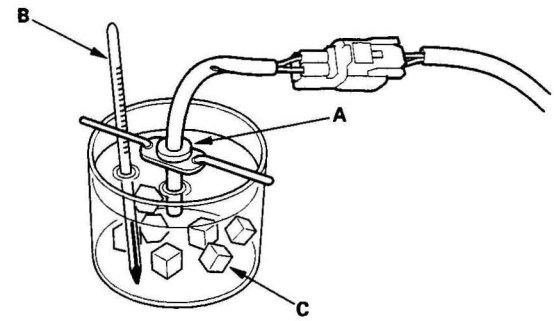
1. Turn the ignition switch ON (II).
2. Push and hold the reset and select buttons for 10 seconds. While you continue to hold the buttons, the display will scroll through temperature settings from +3° to −3° as shown.



3. When the desired correction value appears on the display, release the buttons, and the recalibrated outside air temperature will be displayed.

   If the outside temperature indicator display is off by more than 3 degrees of the desired value, turn the ignition switch OFF and repeat steps 1−3.

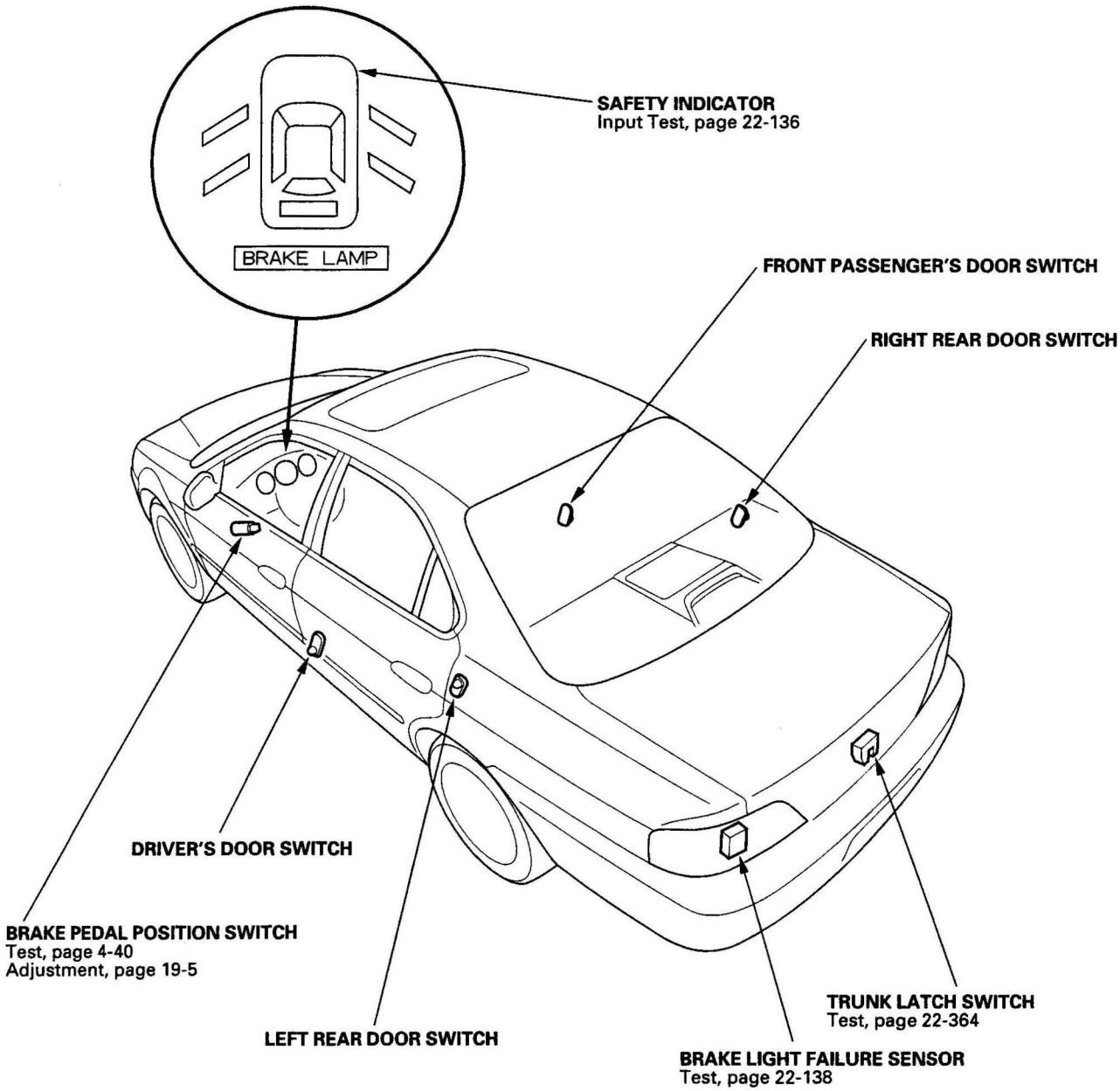
   NOTE: To recalibrate the display to the true temperature, remove the outside air temperature sensor (A), but leave it connected. Submerge the sensor and a thermometer (B) in a container of ice water (C). Select the calibration mode as described above, then recalibrate the display to the true temperature.



Protected by AR

Safety Indicator System

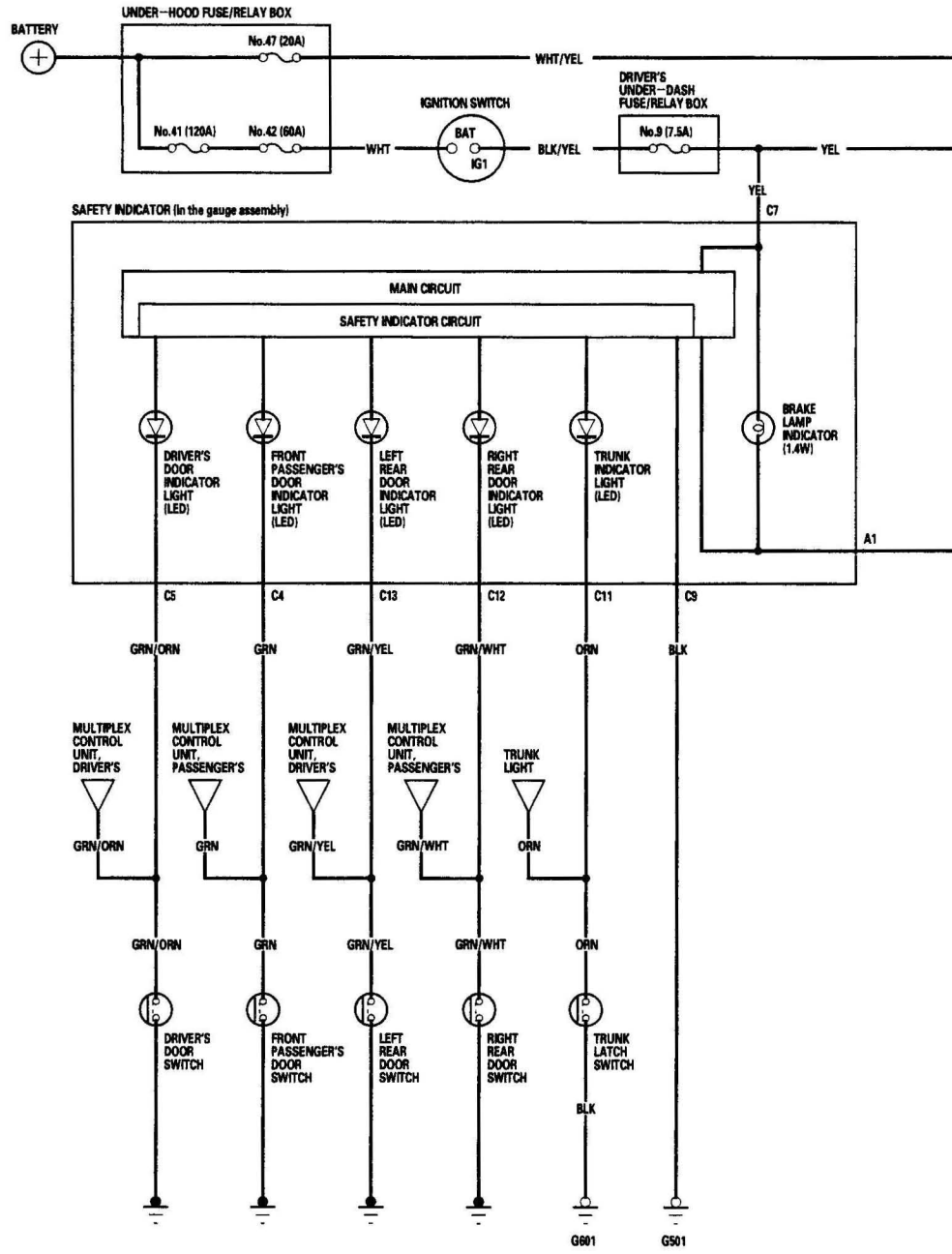
Component Location Index



Protected by AR

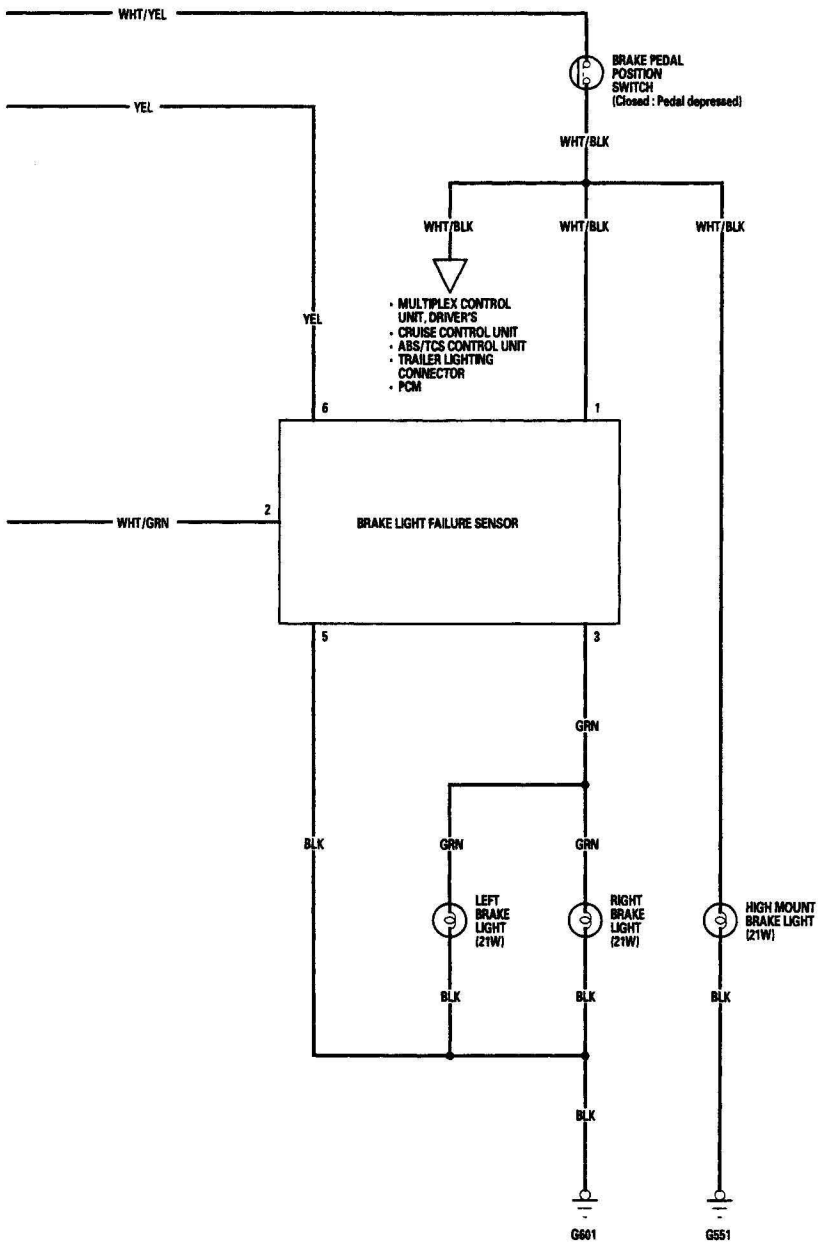
Safety Indicator System

Circuit Diagram



BACK

Protected by AR



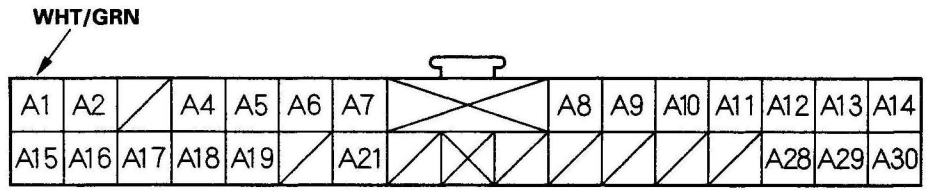
BACK

Protected by AR

Safety Indicator Input Test

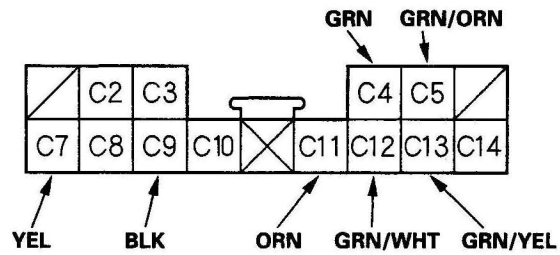
1. Remove the gauge assembly (see page 22-128).
2. Disconnect the 30P connector A and 14P connector C from the gauge assembly.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

30P CONNECTOR A



Wire side of female terminels

14P CONNECTOR C



Wire side of female terminels

BACK

Protected by AR

4. Make these input tests at the connectors.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
C9	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
C7	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A1	WHT/GRN	Under all conditions	Check for continuity between the A1 terminal and the brake failure sensor No. 2 terminal: There should be continuity.	An open in the wire
			Check for continuity between the A1 terminal and body ground: There should be no continuity.	Short to ground

5. Reconnect the connectors to the gauge assembly, and perform the following input tests at the appropriate connector.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the gauge internal circuit must be faulty.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
C4	GRN	Front passenger's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty front passenger's door switch • An open in the wire
		Front passenger's door closed	Check for voltage to ground: There should be 5 V or more.	
C5	GRN/ORN	Driver's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	
C11	ORN	Trunk lid open	Check for voltage to ground: There should be less than 1 V.	• Faulty trunk latch switch • An open in the wire • Poor ground (G601)
		Trunk lid closed	Check for voltage to ground: There should be 5 V or more.	
C12	GRN/WHT	Right rear door open	Check for voltage to ground: There should be less than 1 V.	• Faulty right rear door switch • An open in the wire
		Right rear door closed	Check for voltage to ground: There should be 5 V or more.	
C13	GRN/YEL	Left rear door open	Check for voltage to ground: There should be less than 1 V.	• Faulty left rear door switch • An open in the wire
		Left rear door closed	Check for voltage to ground: There should be 5 V or more.	

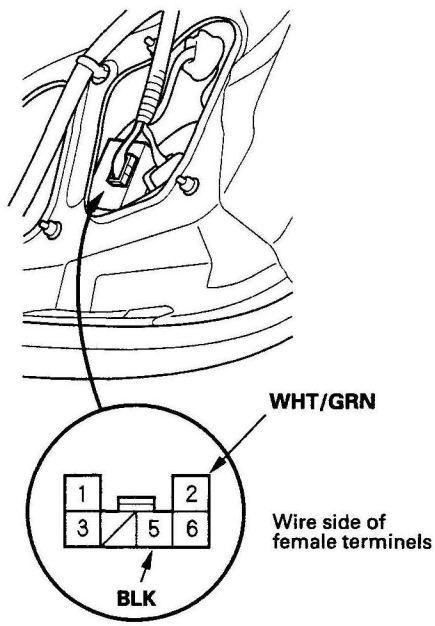
Protected by AR

Brake Light Failure Sensor Test

1. Check to see if the brake lights come on when the brake pedal is depressed.

   - If all the brake lights come on, go to step 2.
   - If one of the brake lights does not come on, check whether the bulb is blown. If the bulb is OK, go to step 2.
   - If none of the brake lights come on, check the brake light circuit (see page 22-155).

2. Open the trunk lid, and remove the left trunk side trim panel (see page 20-58).



3. Make sure the BRAKE LAMP light in the safety indicator does not come on and stay on when the 6P connector is disconnected and the engine is running. If the BRAKE LAMP light in the safety indicator comes on and stays on, check for:

   - A short to ground in the WHT/GRN wire between the safety indicator and the No. 2 terminal of the failure sensor.
   - A faulty safety indicator circuit in the gauge assembly.

4. Reconnect the 6P connector.

5. Make sure the BRAKE LAMP light in the safety indicator comes on and goes off when the No. 5 terminal of the 6P connector is grounded, the brake pedal is depressed, and the ignition switch is turned from OFF to ON (II).

   - If the BRAKE LAMP light in the safety indicator comes on and stays on, check for a faulty sensor.

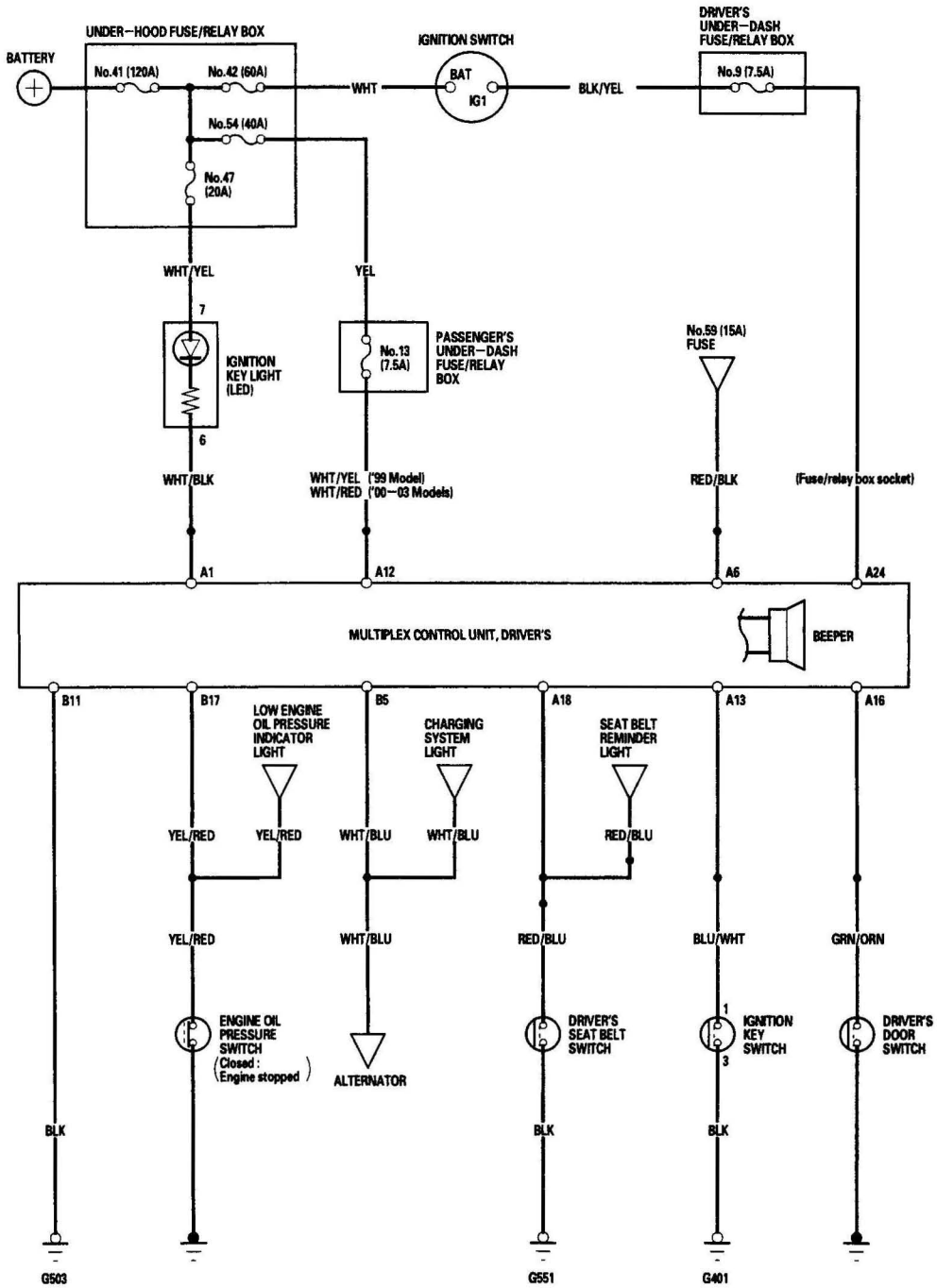
   - If the BRAKE LAMP light goes off, check for:
     – A poor ground (G601).
     – An open in the wire.

BACK

Protected by AR

Lights-on, Key-in, Seat Belt Reminder, Key Light Timer, and Engine Oil Pressure Indicator Systems

Circuit Diagram



BACK

Protected by AP

Control Unit Input Test

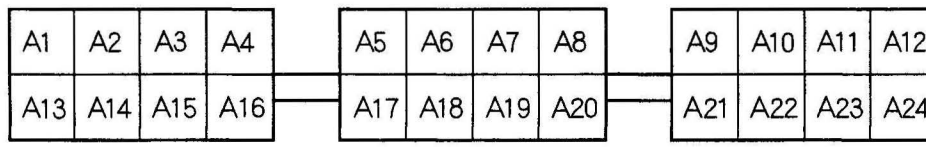
1. Before testing these systems, troubleshoot the multiplex control system (see page 22-298).

Multiplex Control Unit, Driver's

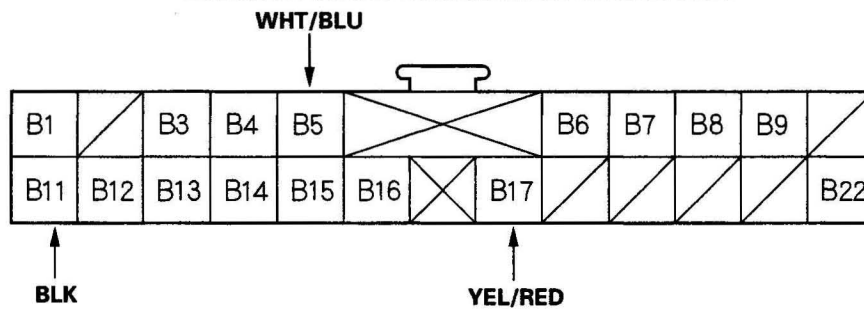
2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.

3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

FUSE/RELAY BOX SOCKET



MULTIPLEX CONTROL UNIT, DRIVER'S CONNECTOR B



Wire side of female terminals

BACK

Protected by AR

4. Make these input tests at the fuse/relay box socket, and the multiplex connector B.

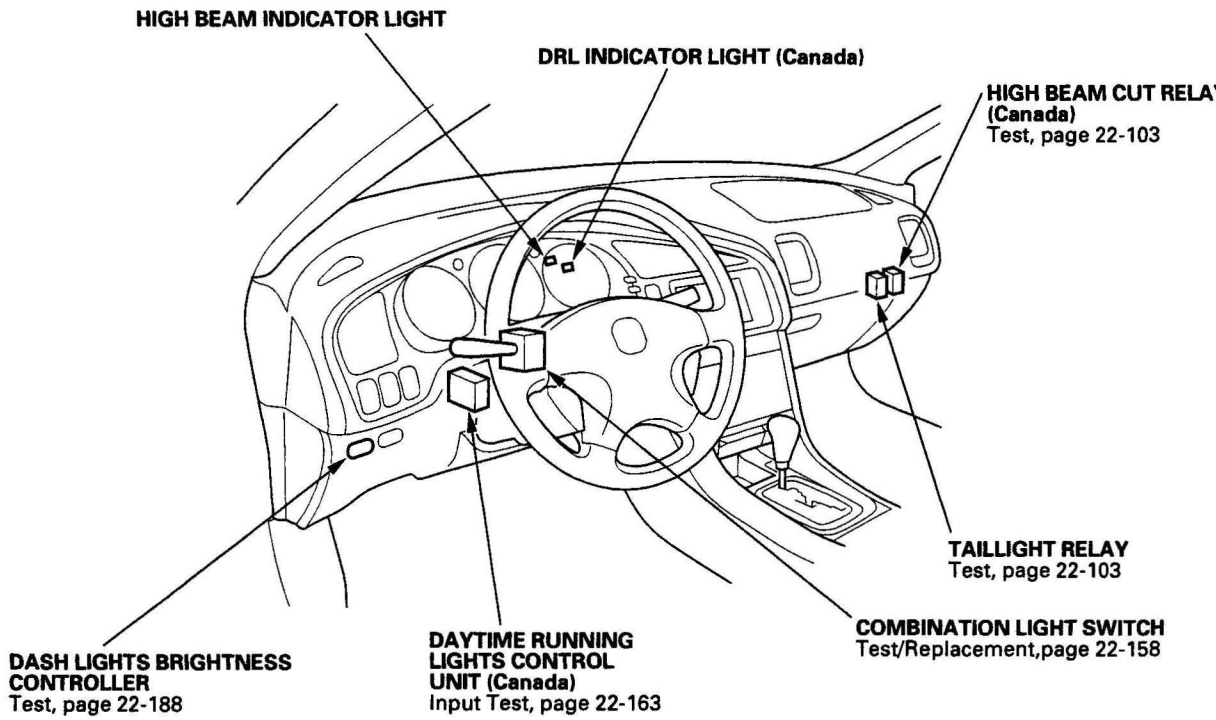
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the control unit must be faulty; replace it.

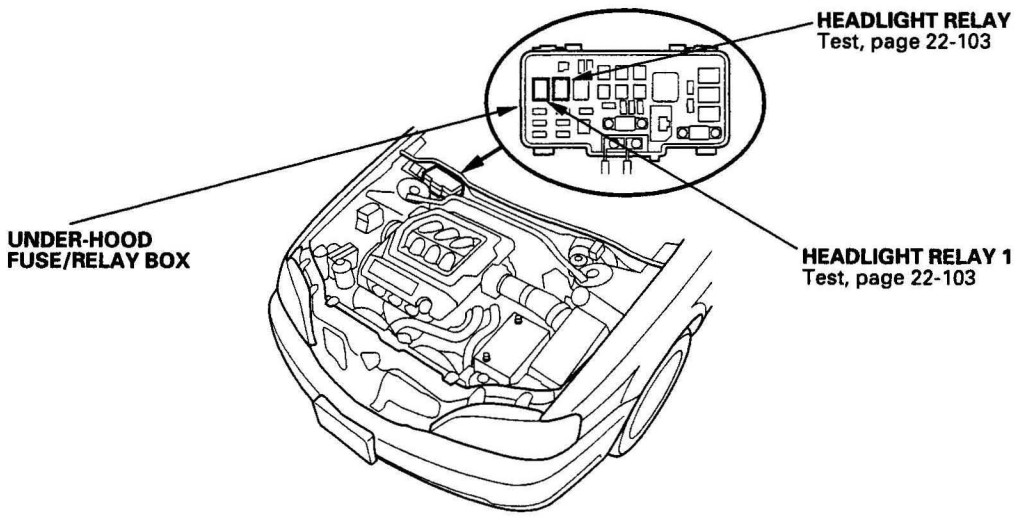
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5 A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A6		Combination light switch ON (≣D) Jump 12 volts to B16 (RED/GRN) terminal	Check for voltage to ground: There should be battery voltage.	• Blown No. 59 (15 A) fuse in the under-hood fuse/relay box • Faulty taillight relay • An open in the wire
A1		Under all conditions	Attach to ground: Ignition key light should come on.	• Blown No. 47 (20 A) fuse in the under-hood fuse/relay box • Faulty LED • An open in the wire
A13		Ignition key is inserted into the ignition switch	Check for continuity to ground: There should be continuity.	• Faulty ignition key switch • Poor ground (G401) • An open in the wire
A16		Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
A18		Driver's seat belt is buckled.	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's seat belt switch • Poor ground (G551) • An open in the wire
B5	WHT/BLU	Engine running	Check for voltage to ground: There should be battery voltage.	• Faulty charging system • An open in the wire
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • An open in the wire
B17	YEL/RED	Ignition switch OFF	Check for continuity to ground: There should be continuity.	• Faulty engine oil pressure switch • An open in the wire
		Ignition switch ON (II)	Check the low engine oil indicator light operation. The indicator light should come on.	• Blown bulb • An open in the wire
		Start the engine.	Check for voltage to ground: There should be battery voltage.	• Insufficient oil • Improper lubrication • Faulty engine oil pressure switch • A short in the wire

Protected by AR

Component Location Index

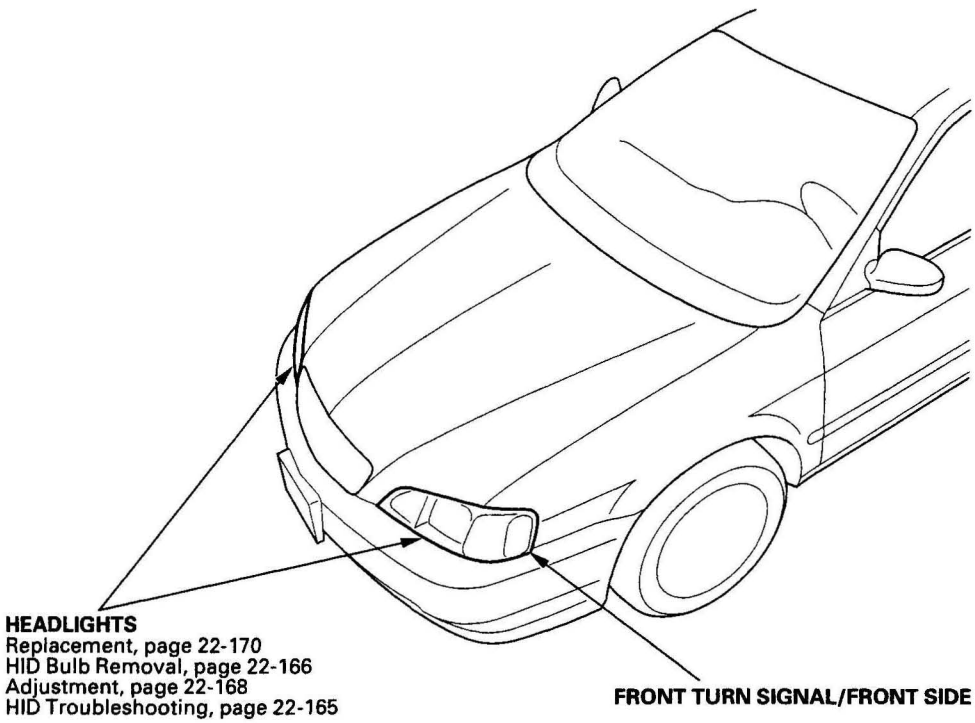
'99-01 Models





BACK

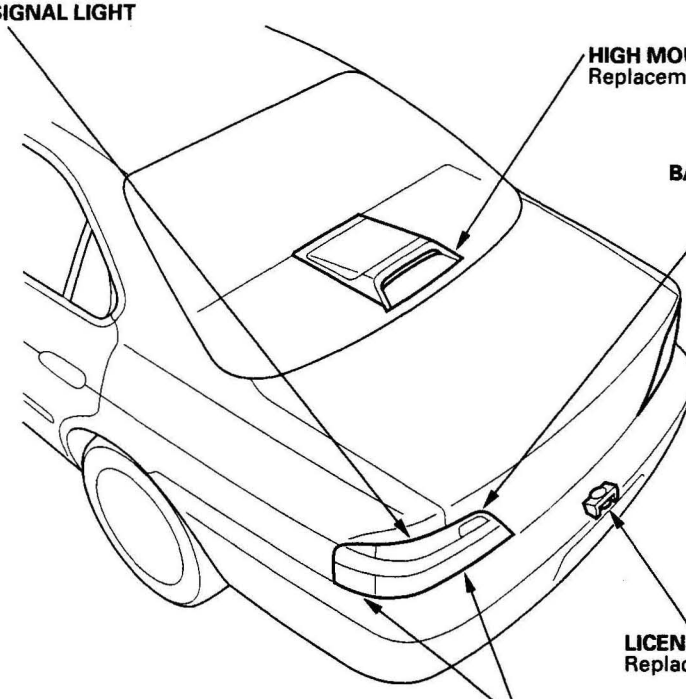
Protected by AR



HEADLIGHTS
Replacement, page 22-170
HID Bulb Removal, page 22-166
Adjustment, page 22-168
HID Troubleshooting, page 22-165

FRONT TURN SIGNAL/FRONT SIDE MARKER LIGHT

REAR TURN SIGNAL LIGHT



HIGH MOUNT BRAKE LIGHT
Replacement, page 22-171

BACK-UP LIGHT

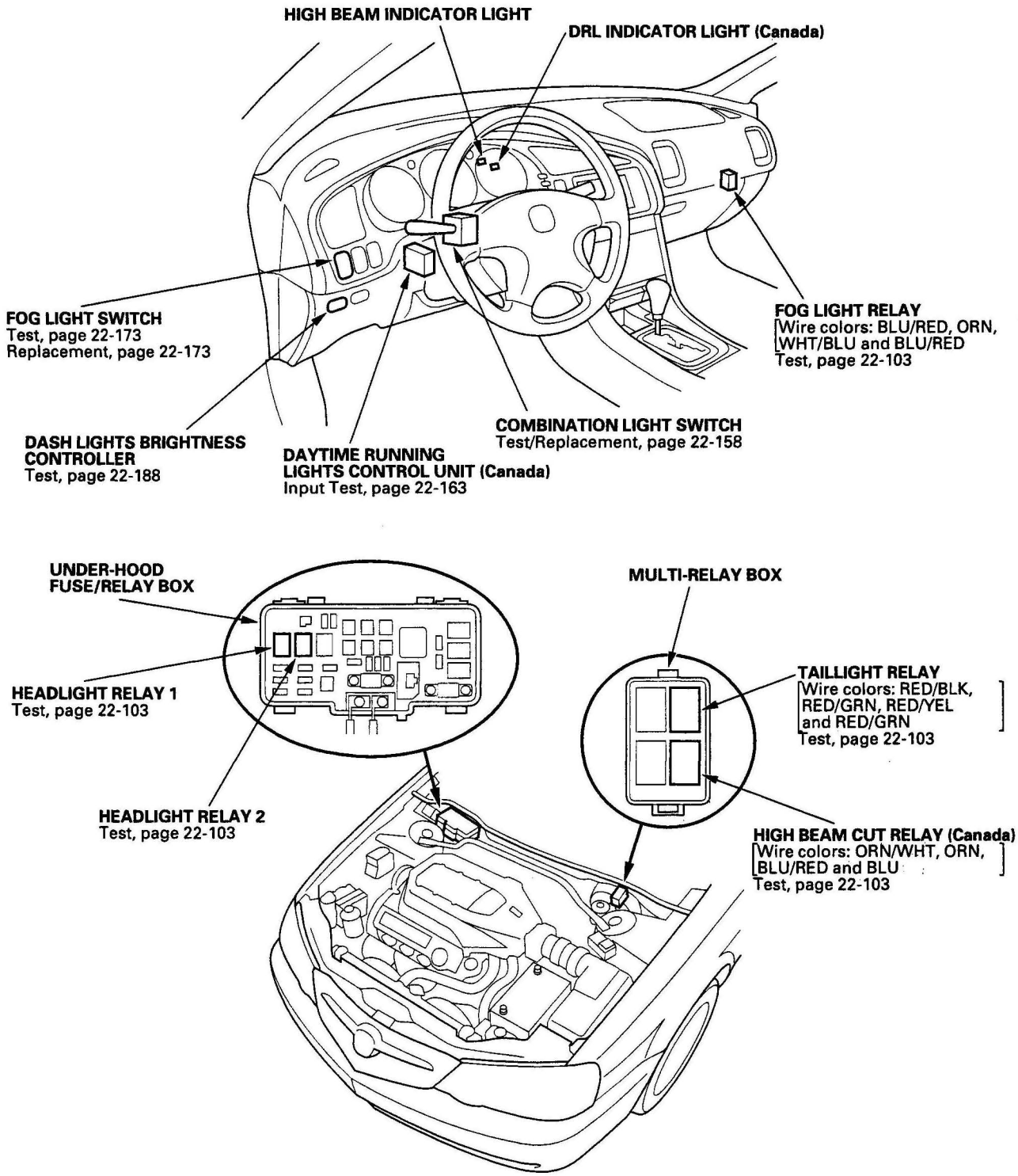
LICENSE PLATE LIGHT
Replacement, page 22-171

TAILLIGHTS and BRAKE LIGHTS
Replacement, page 22-170

Protected by AR

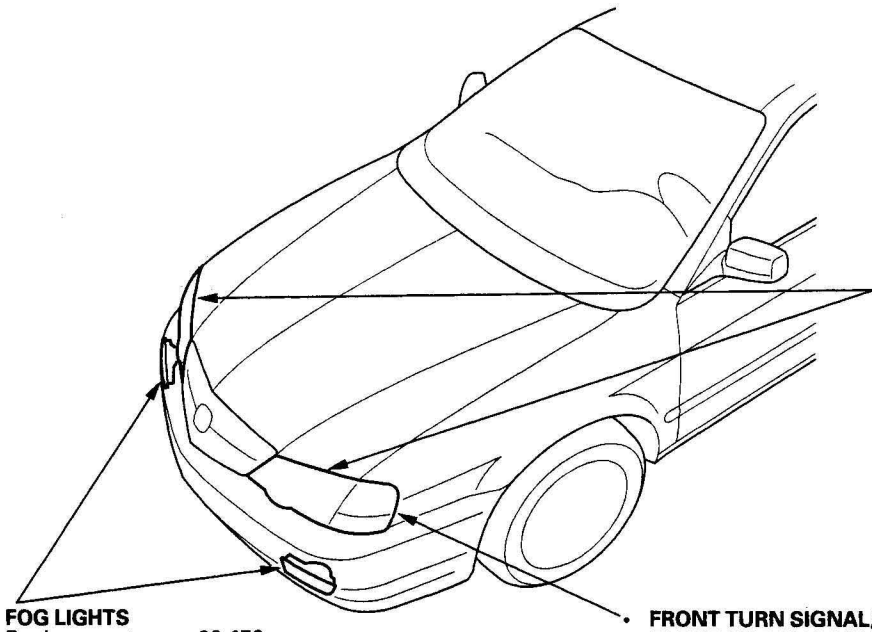
Component Location Index (cont'd)

'02-03 Models



BACK

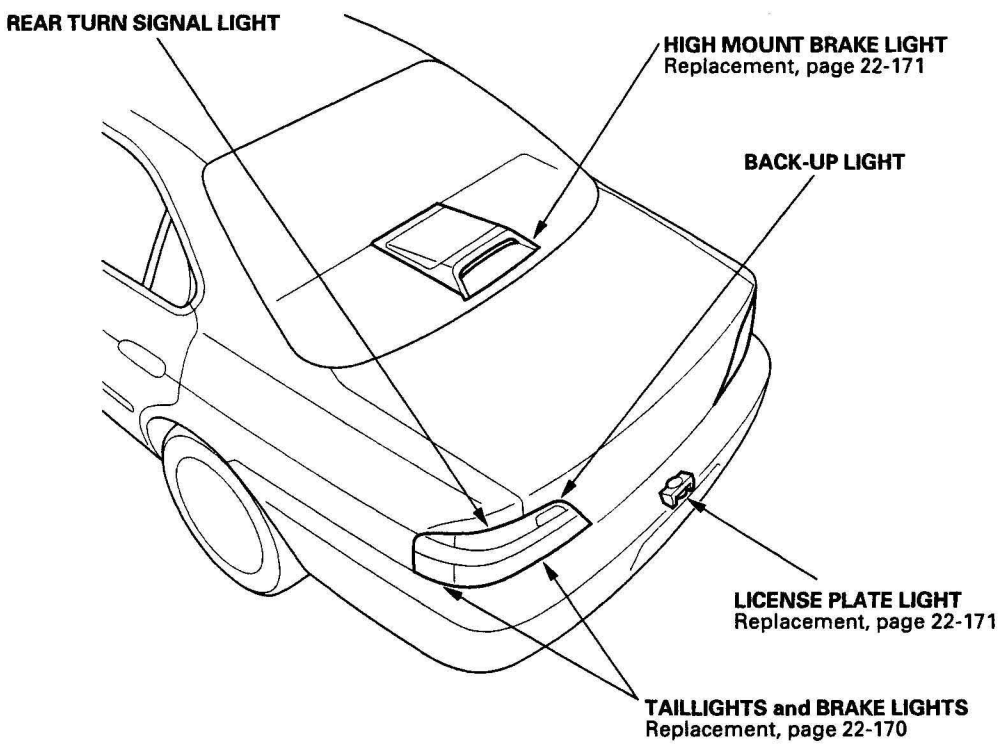
Protected by AR



HEADLIGHTS
Replacement, page 22-170
HID Buld Removal, page 22-166
Adjustment, page 22-168
HID Troubleshooting, page 22-165

FOG LIGHTS
Replacement, page 22-172
Adjustment, page 22-173

- **FRONT TURN SIGNAL/PARKING LIGHTS**
- **FRONT SIDE MARKER LIGHT**
  Bulb Replacement, page 22-172



REAR TURN SIGNAL LIGHT

HIGH MOUNT BRAKE LIGHT
Replacement, page 22-171

BACK-UP LIGHT

LICENSE PLATE LIGHT
Replacement, page 22-171

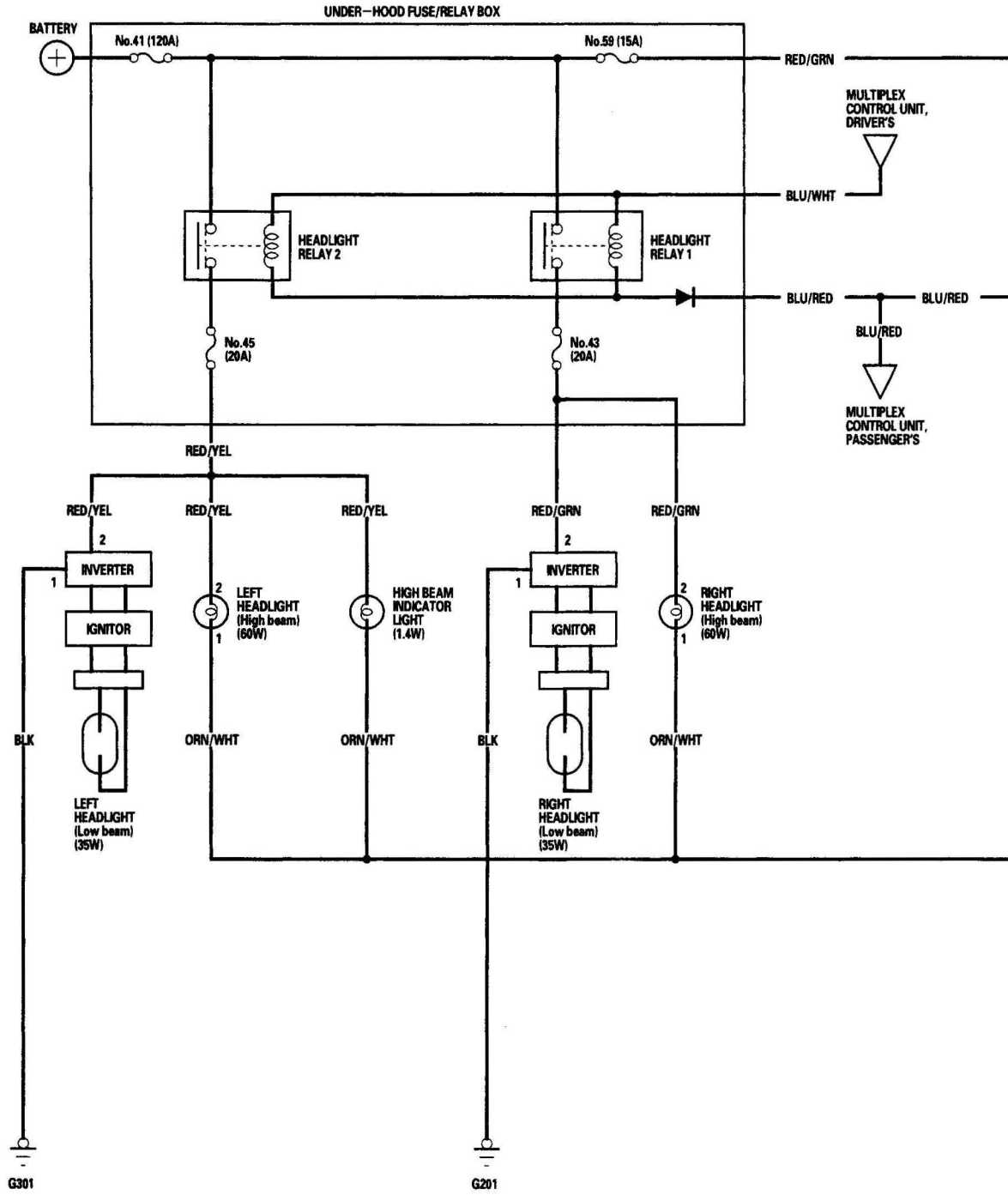
TAILLIGHTS and BRAKE LIGHTS
Replacement, page 22-170

BACK

Protected by AR

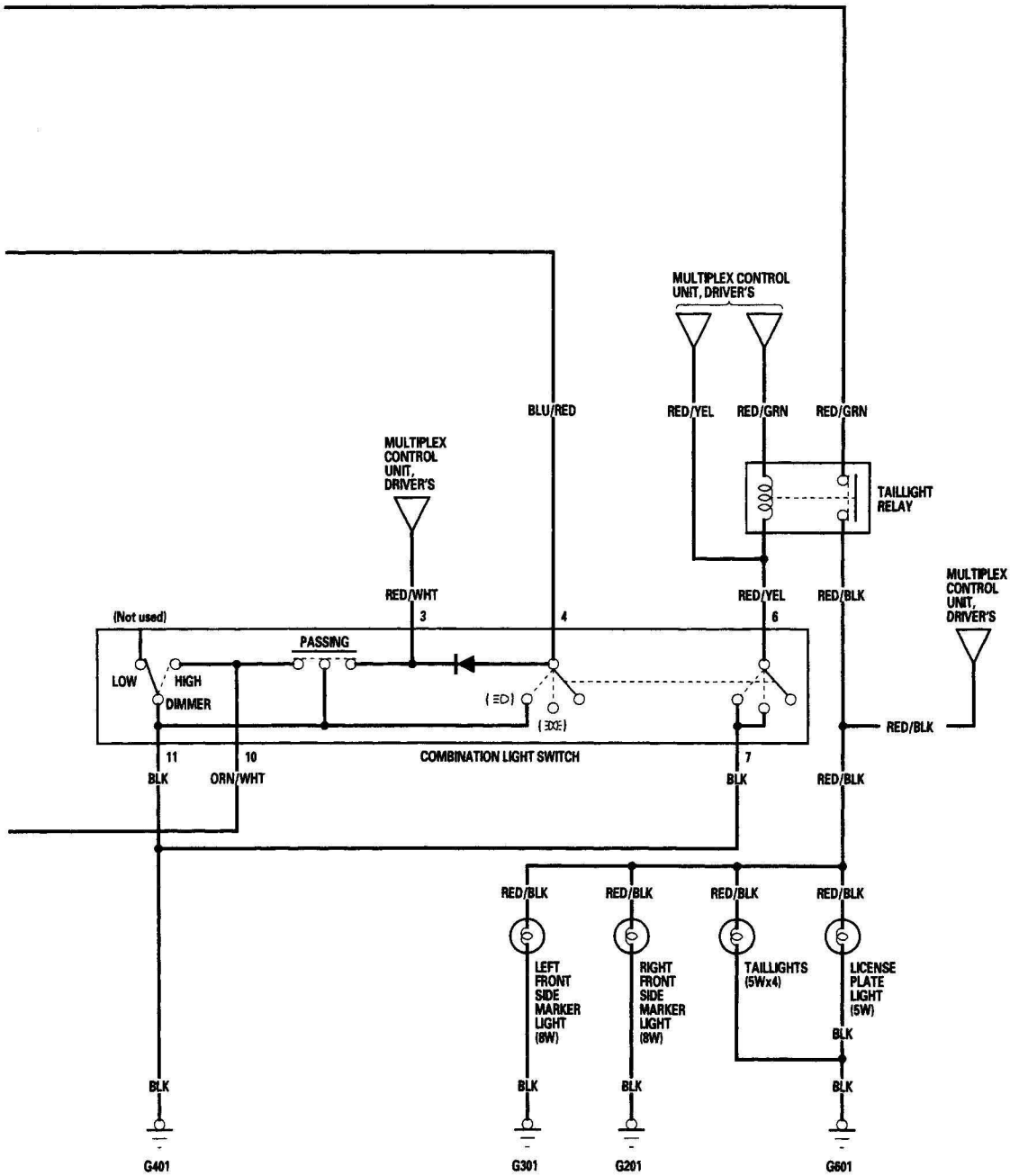
Circuit Diagram - USA

'99-01 Models



BACK

Protected by AR

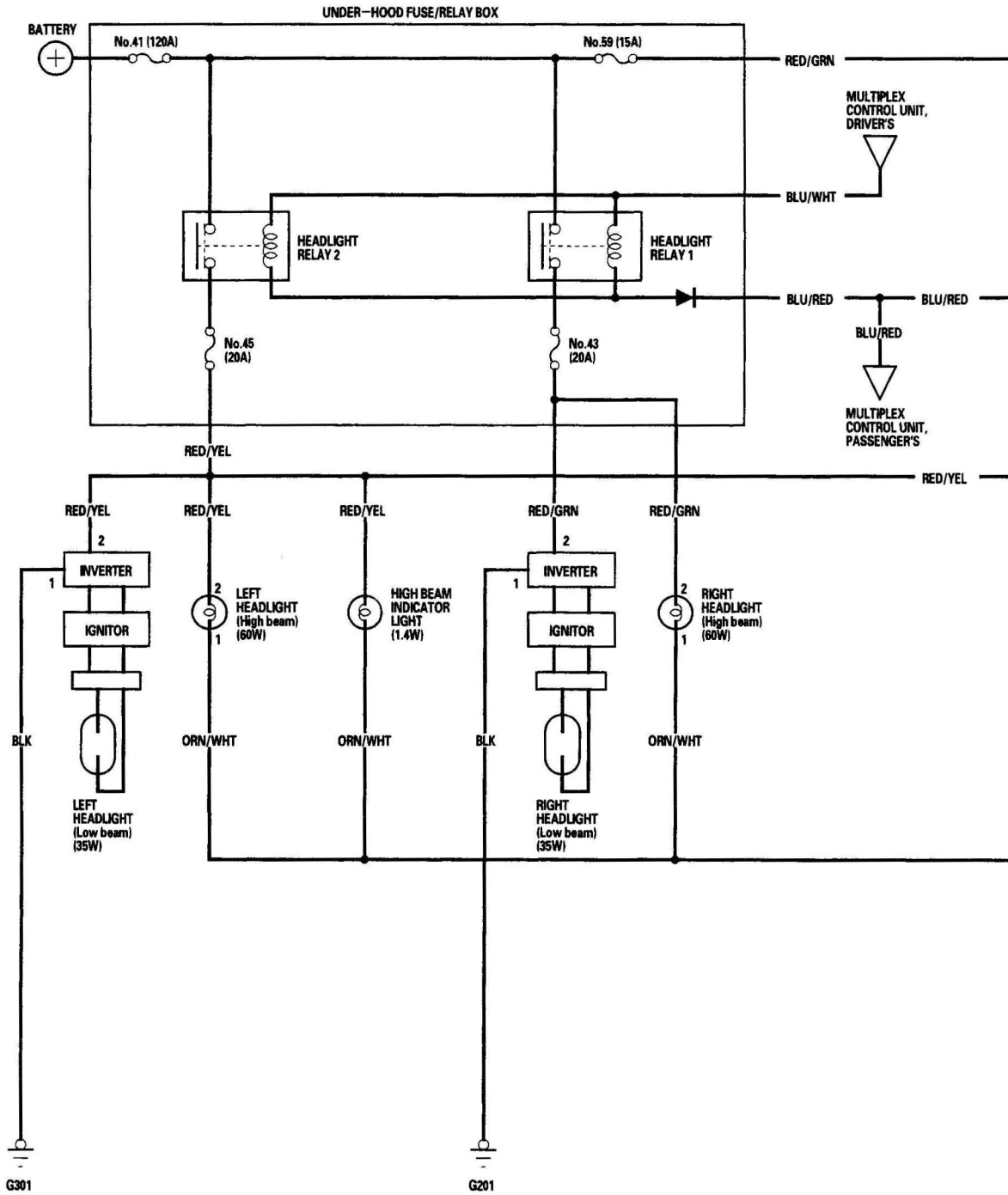


BACK

Protected by AR

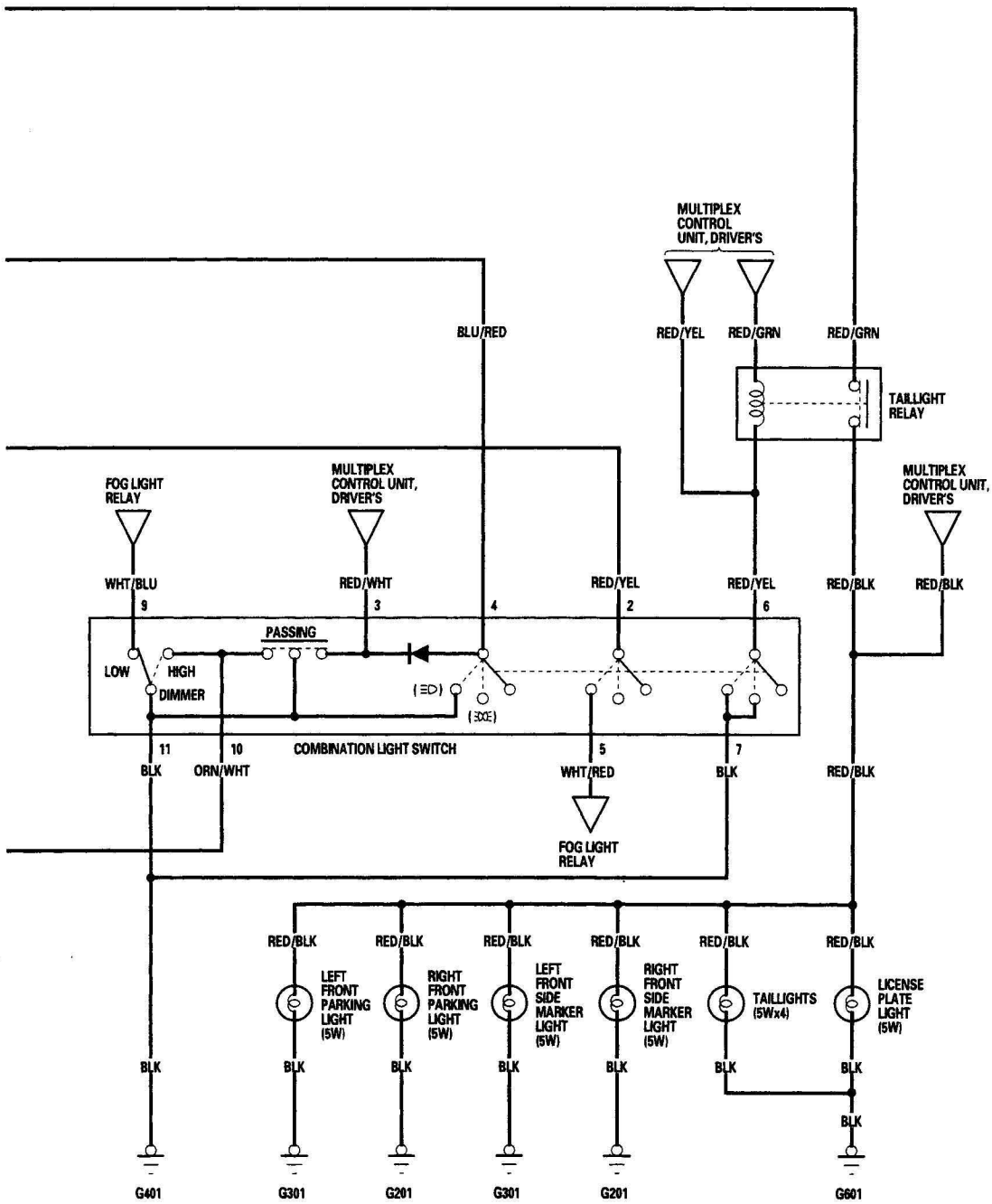
Circuit Diagram - USA (cont'd)

'02-03 Models



BACK

Protected by AR

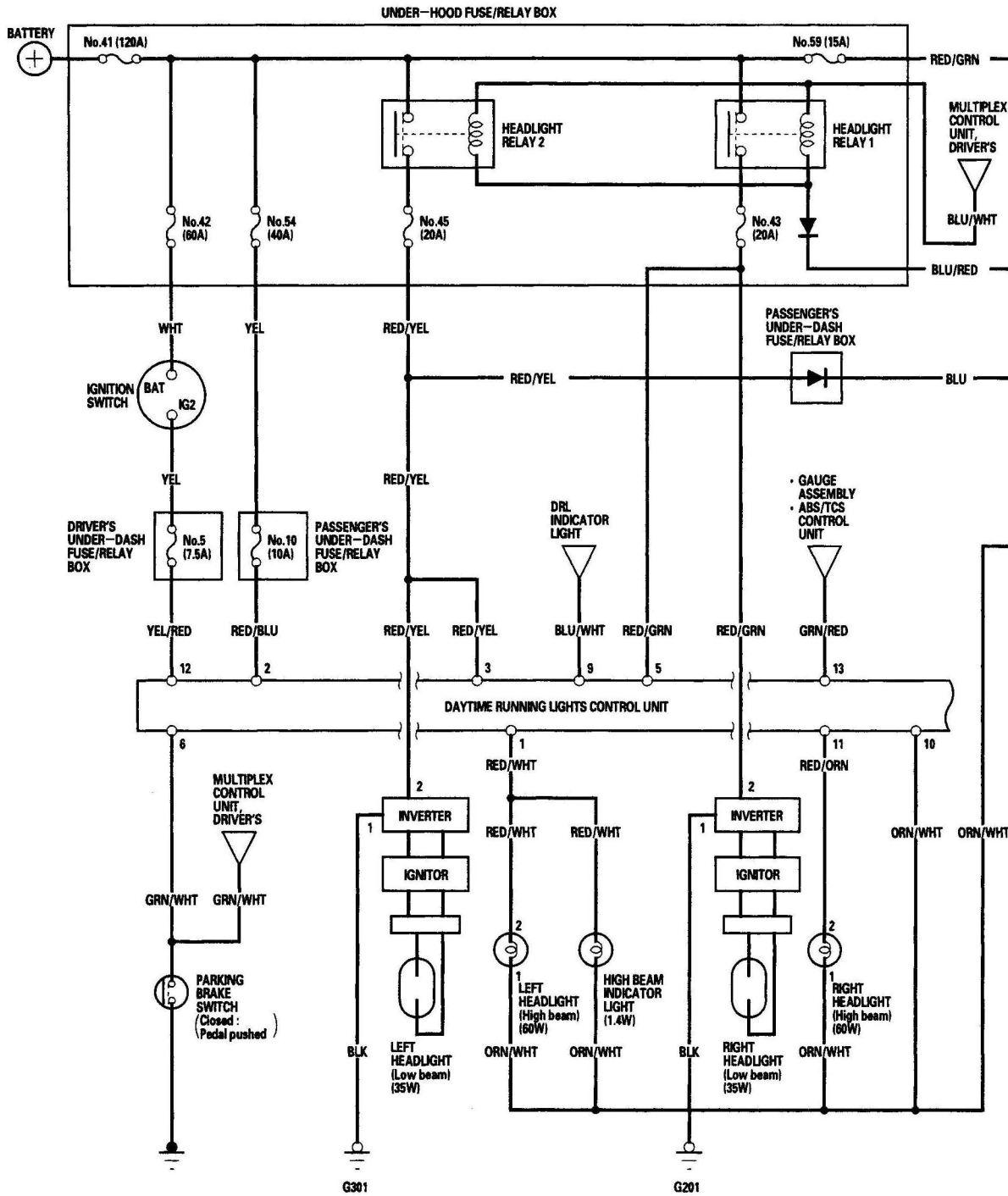


BACK

Protected by AR

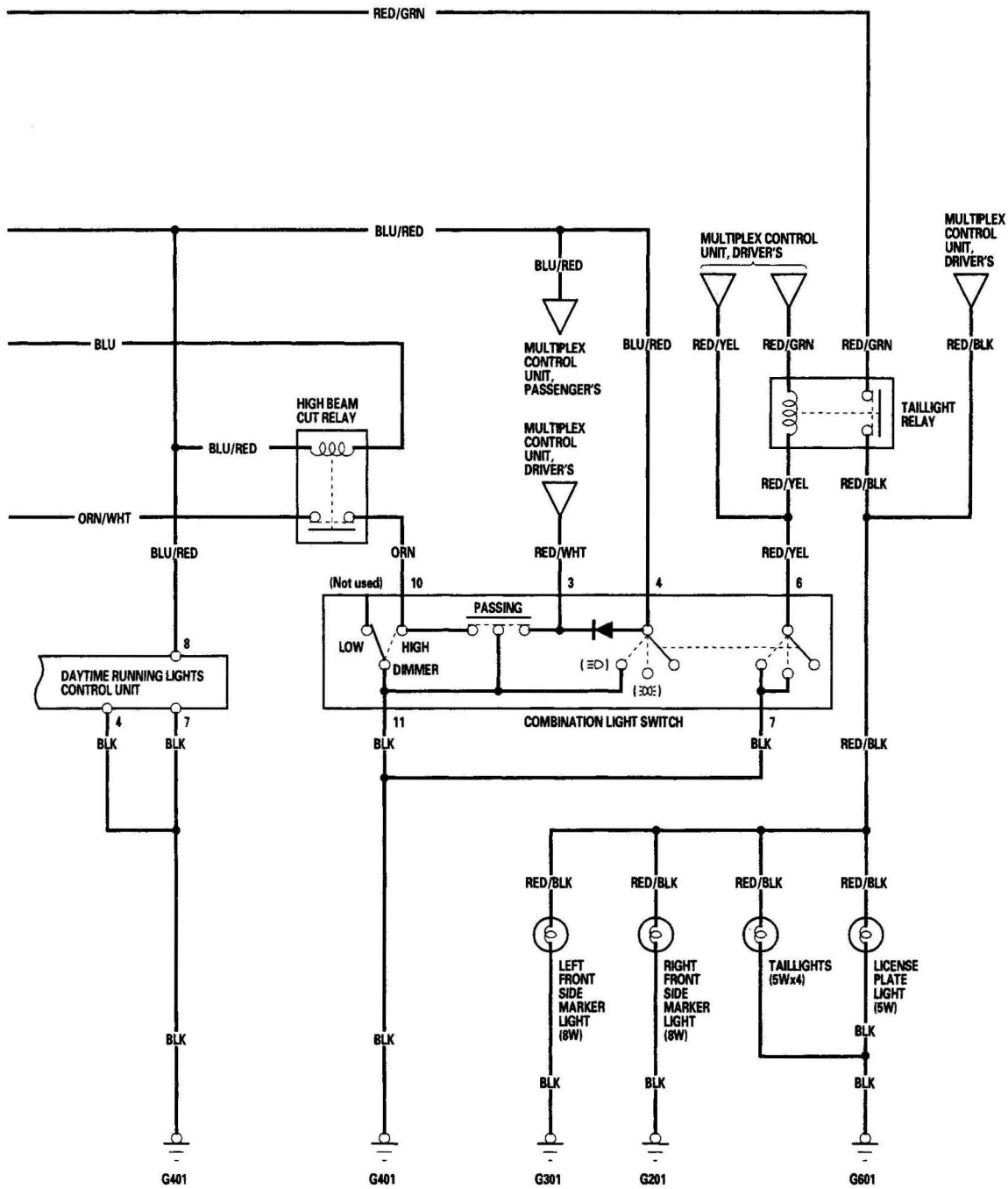
Circuit Diagram - Canada

'99-01 Models



BACK

Protected by AR

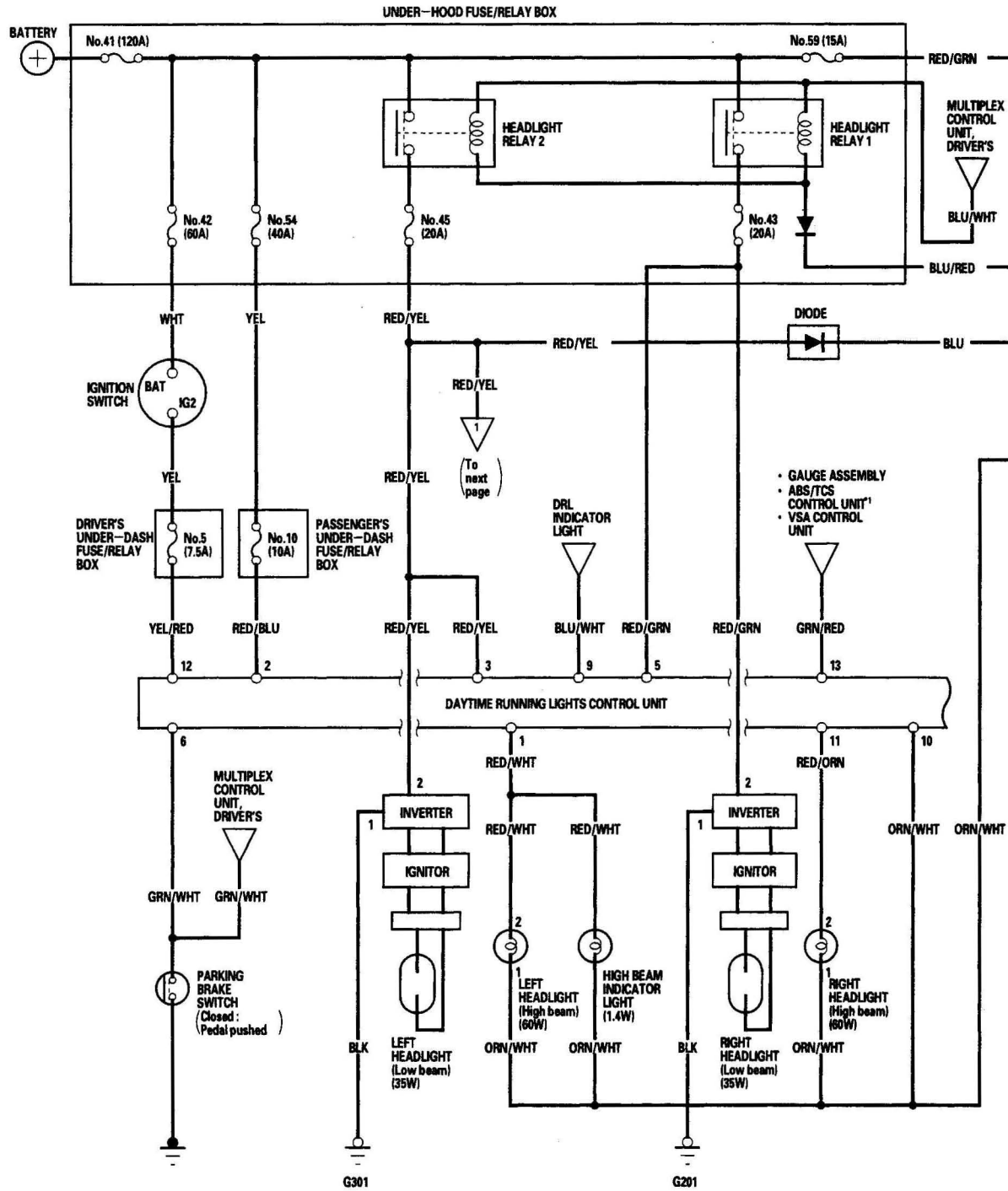


BACK

Protected by AR

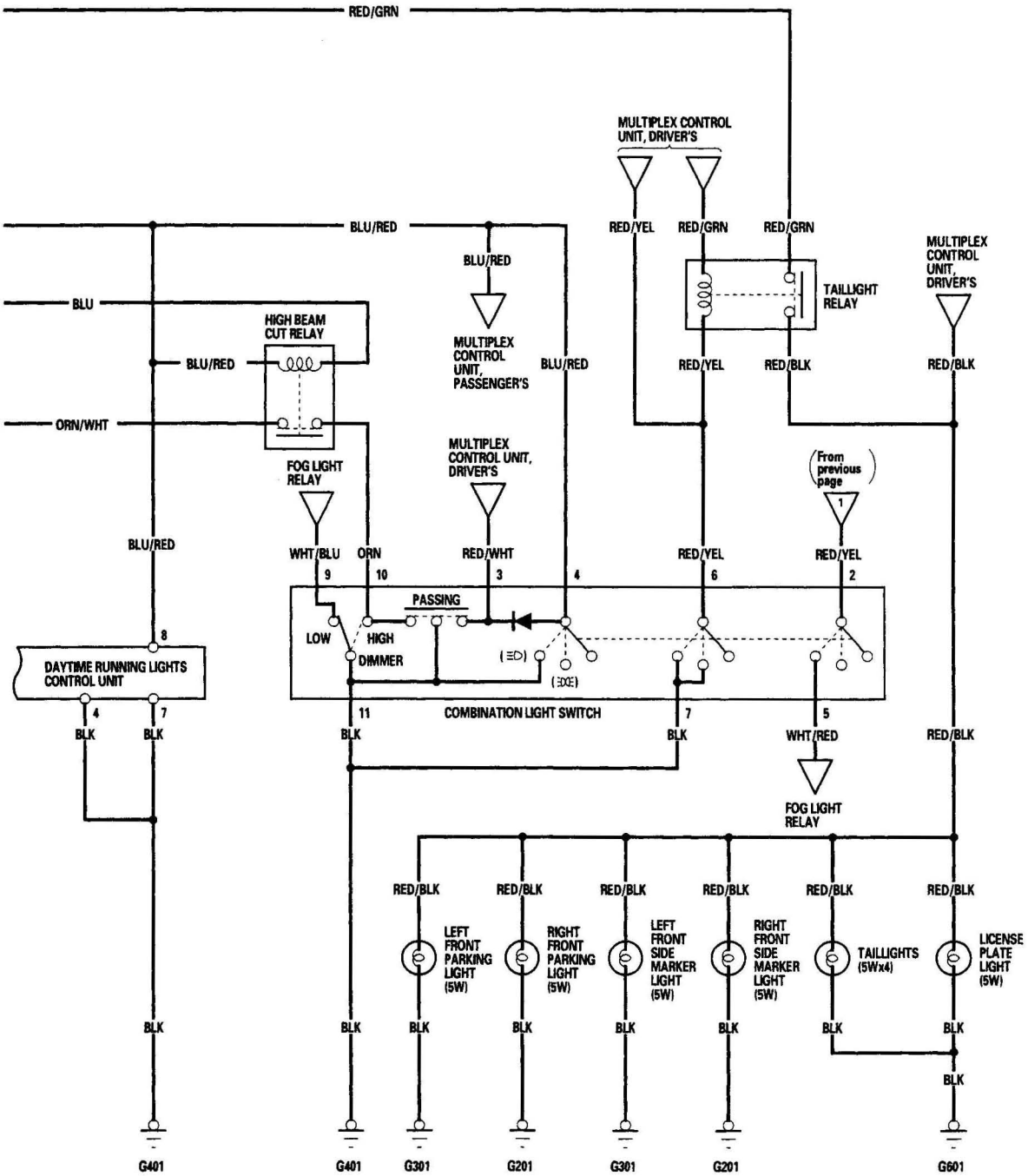
Circuit Diagram - Canada (cont'd)

'02-03 Models



BACK

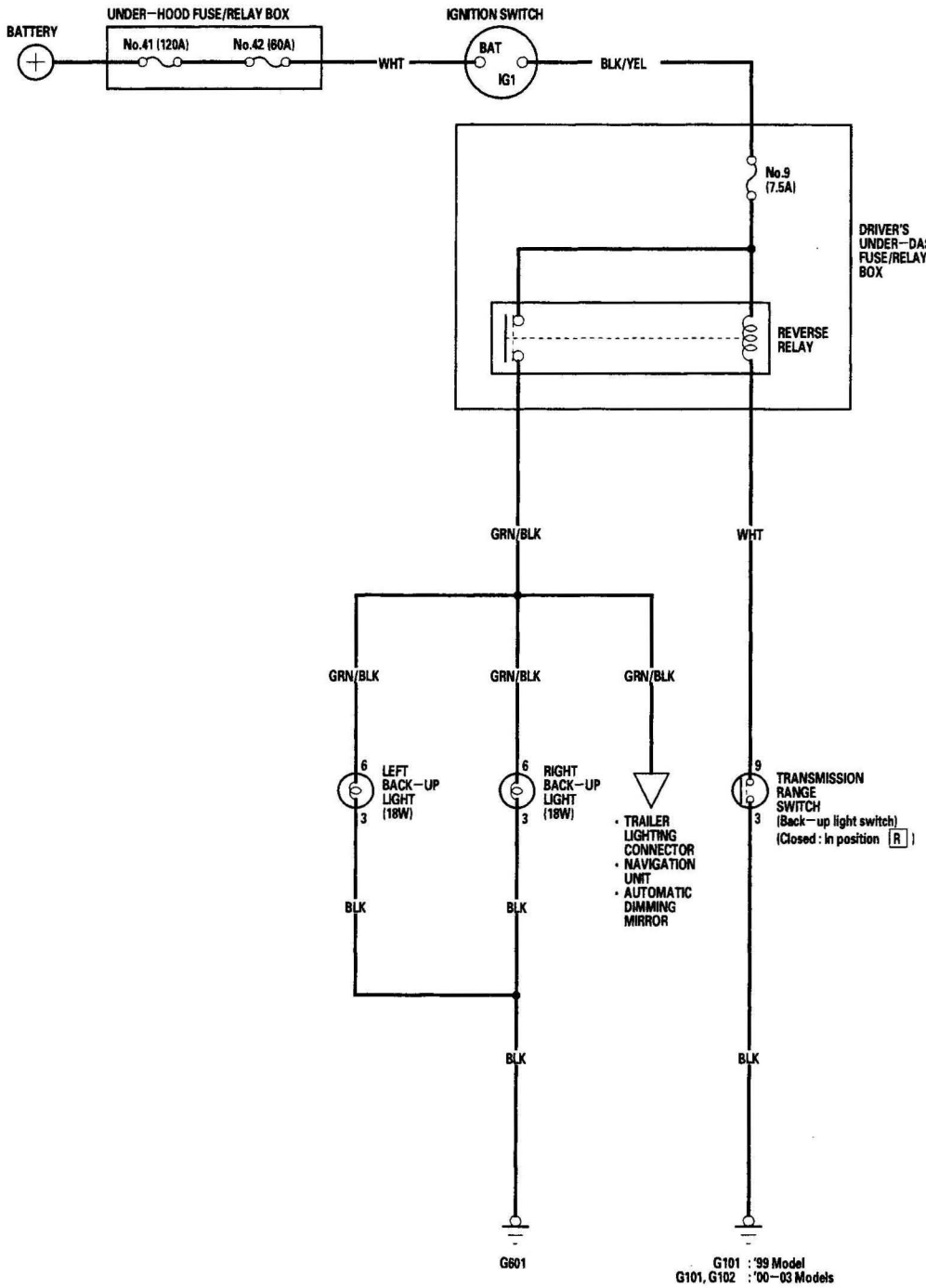
Protected by AR



BACK

Protected by AR

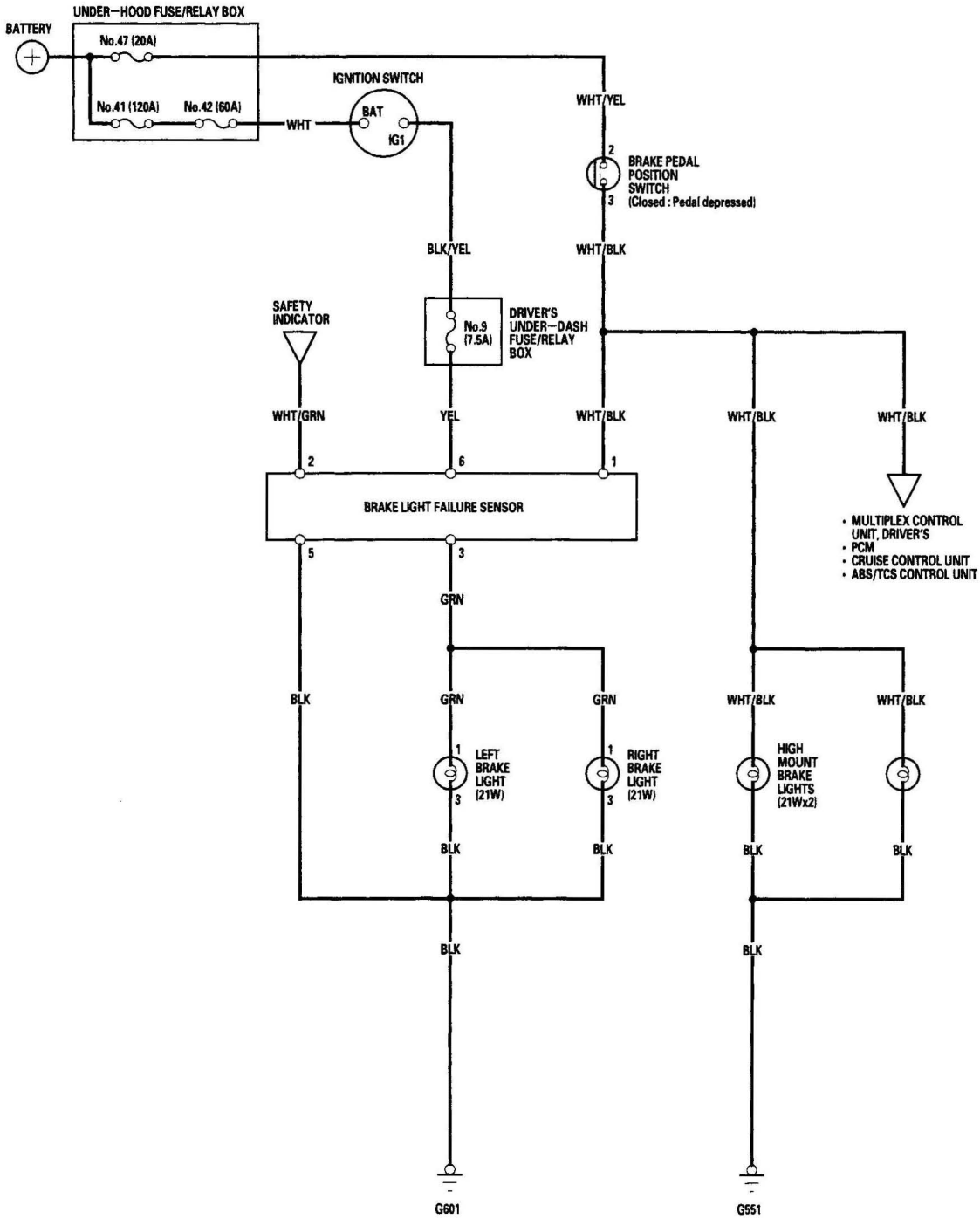
Circuit Diagram - Back-up Lights



BACK

Protected by AR

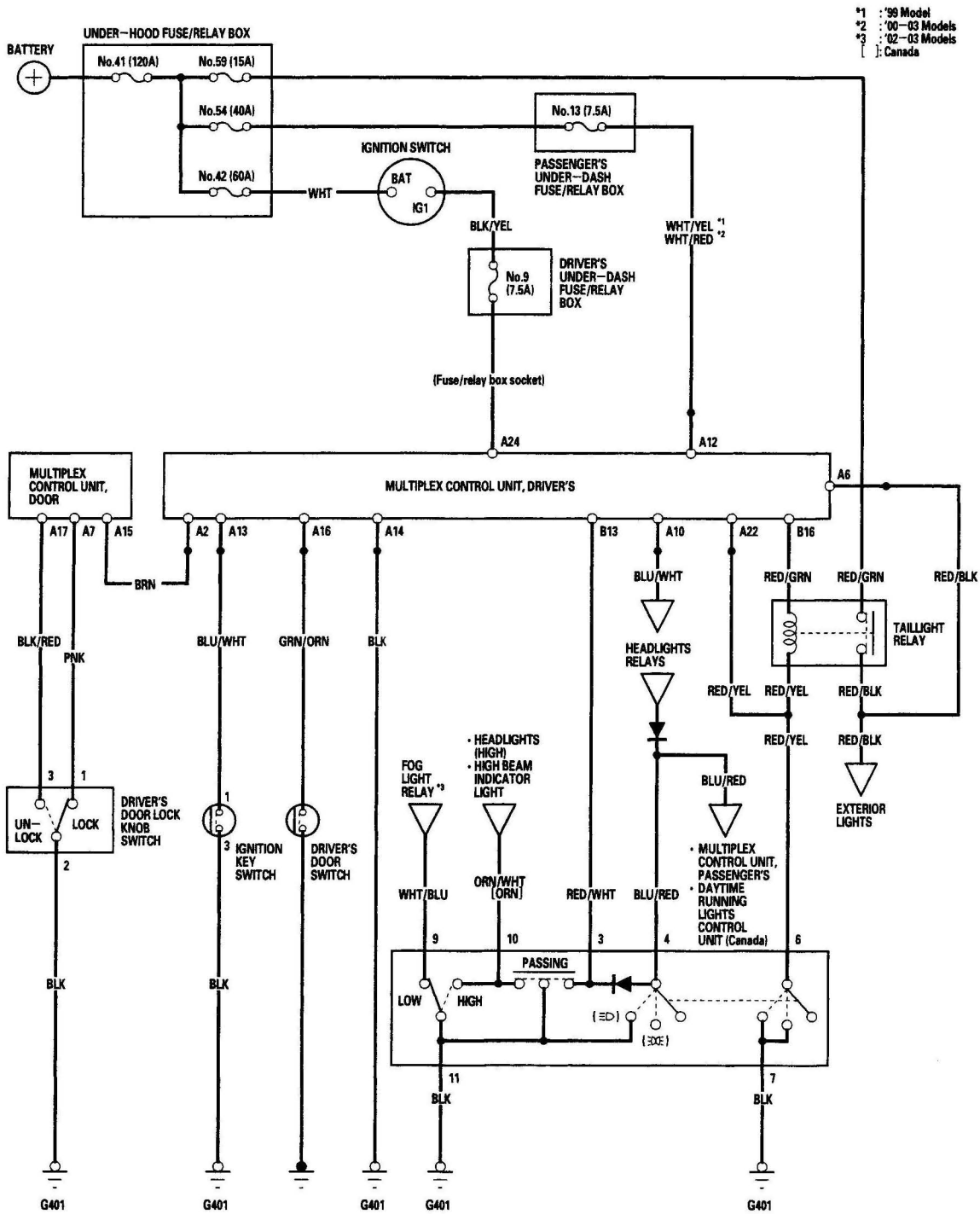
Circuit Diagram - Brake Lights



BACK

Protected by AR

Circuit Diagram - Auto-off Headlights

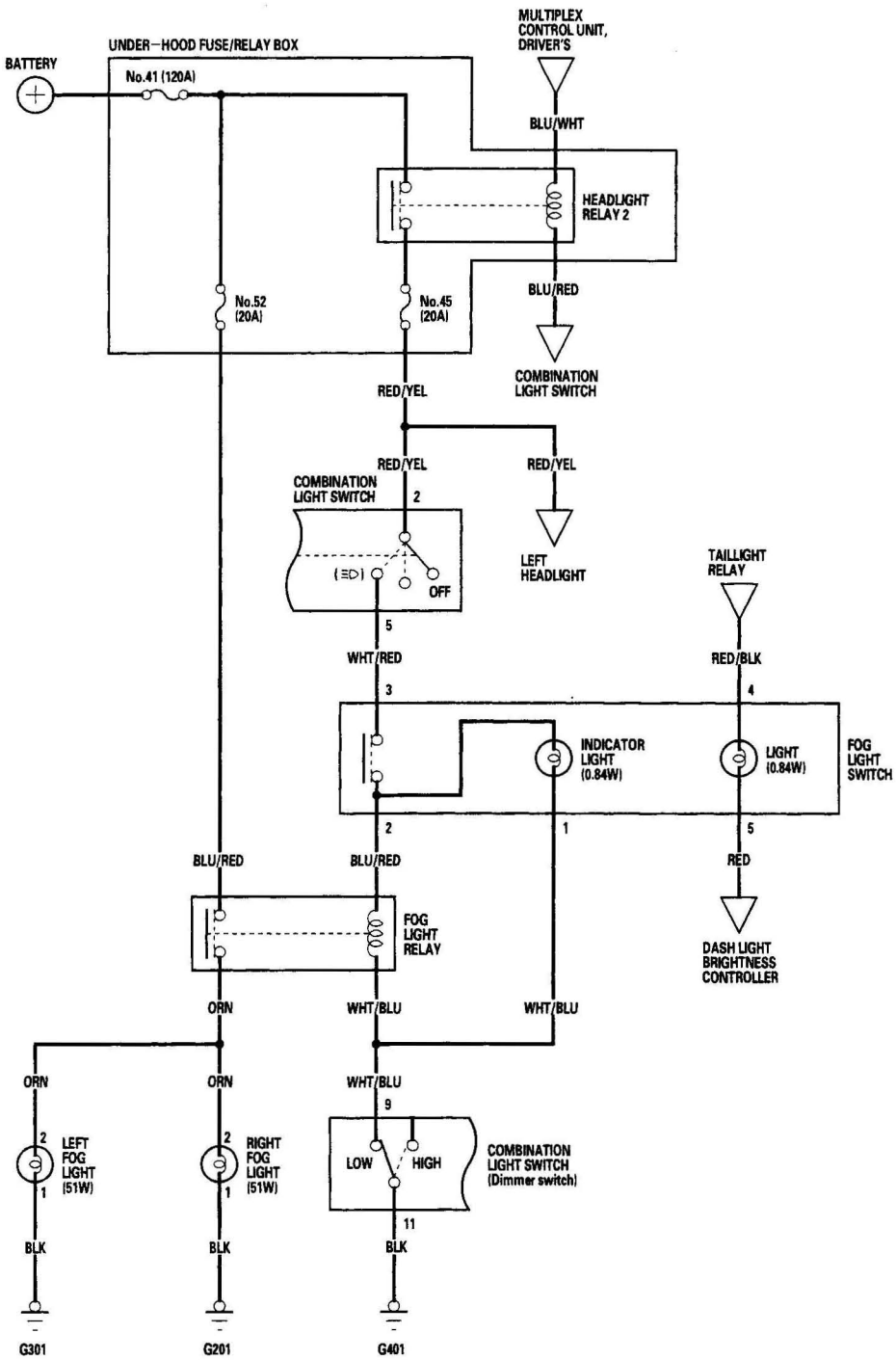


BACK

Protected by AR

Circuit Diagram - Fog Lights

'02-03 Models

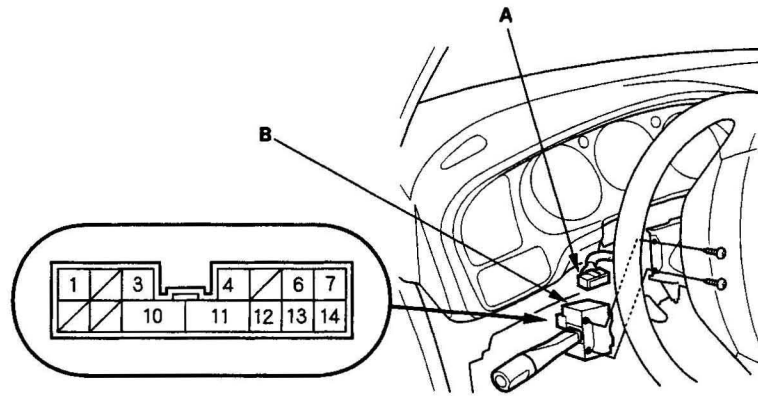


Protected by AR

Combination Light Switch Test/Replacement

'99-01 Models

1. Remove the driver's dashboard lower cover (see page 20-65).
2. Remove the steering column covers (see page 17-27).
3. Disconnect the 14P connector (A) from the combination light switch (B).



4. Remove the two screws, then pull out the combination light switch.
5. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, check for continuity between the terminals in each switch position according to the tables.
     - If there is no continuity, replace the switch.

Light switch:

Position \ Terminal			3	4	11	10	6	7
Headlight switch	OFF							
	≡D						o—o	
		LOW	o—o	o—o	o—o		o—o	
		HIGH	o—o	o—o	o—o	o—o	o—o	
Passing switch	OFF							
	ON		o—o	o—o	o—o	o—o		

Turn signal switch:

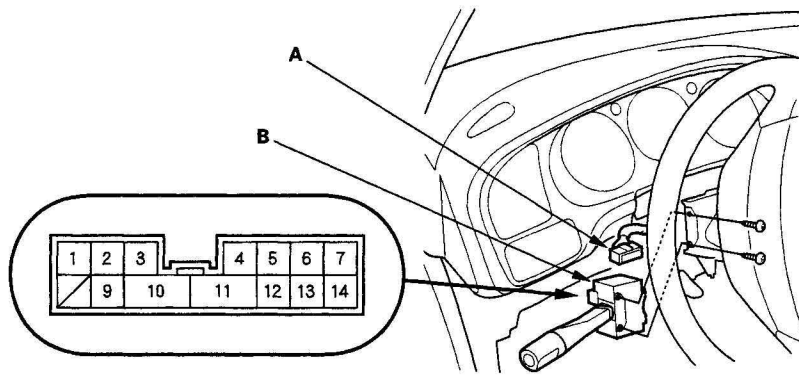
Position \ Terminal	12	13	14
LEFT	o—o		
NEUTRAL			
RIGHT		o—o	

BACK

Protected by AR

'02-03 Models

1. Remove the driver's dashboard lower cover. (see page 20-65).
2. Remove the steering column covers. (see page 17-27).
3. Disconnect the 14P connector (A) from the combination light switch (B).



4. Remove the two screws, then pull out the combination light switch.
5. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, check for continuity between the terminals in each switch position according to the tables.
     - If there is no continuity, replace the switch.

Light switch:

Position \ Terminal			2	3	4	5	11	10	9	6	7
Headlight switch	OFF						○		○		
	≡D						○		○	○	○
	≡D	LOW	○	○	○	○	○		○	○	○
	≡D	HIGH	○	○	○	○	○	○		○	○
Passing switch	OFF										
	ON			○	○		○	○			

Turn signal switch:

Position \ Terminal	12	13	14
LEFT	○	○	
NEUTRAL			
RIGHT		○	○

Protected by AR

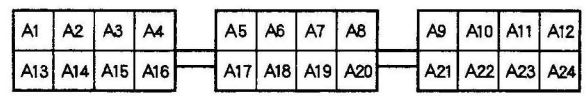
Control Unit Input Test

1. Before testing the exterior light control functions, troubleshoot the multiplex control system (see page 22-298).

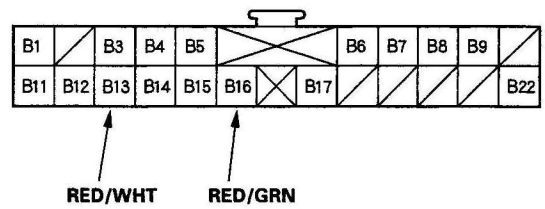
Multiplex Control Unit, Driver's:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

FUSE/RELAY BOX SOCKET

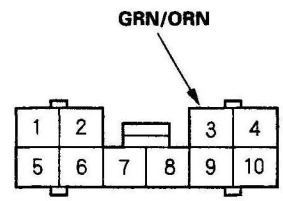


MULTIPLEX CONTROL UNIT, DRIVER'S CONNECTOR B
(Plugs into multiplex control unit, driver)



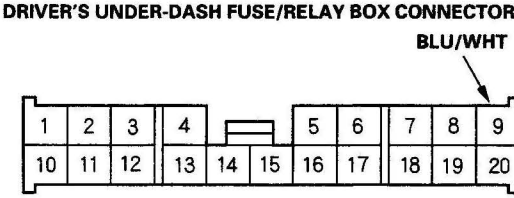
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR O

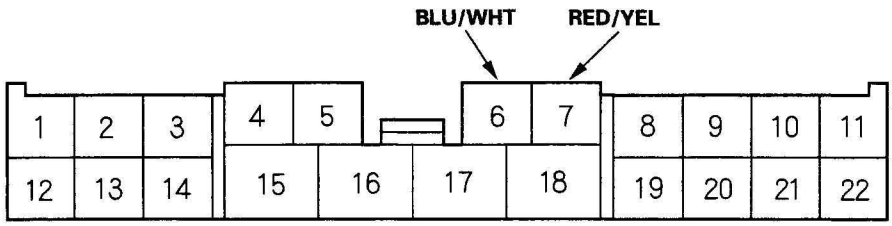


Wire side of female terminals

BACK

Protected by AR

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR Q



Wire side of female terminels

4. With the driver's multiplex control unit still disconnected, make these input tests at the connector or driver's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5 A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the driver's under-dash fuse/relay box. For driver's under-dash fuse/relay box connector socket location (see page 22-93).

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch. • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • A short to ground
B16	RED/GRN	Combination light switch ON	Check for voltage to ground: There should be about 12 V.	• Poor ground (G401) • Faulty combination light switch • An open in the wire
B13	RED/WHT	Passing switch ON	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty combination light switch • An open in the wire
09	BLU/WHT	Ignition key is in the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition switch • An open in the wire
		Ignition key is out of the ignition switch	Check for voltage to ground: There should be 5 V or more.	
Q6	BLU/WHT	Combination light switch ON	Check for voltage to ground: There should be about 12 V.	• Poor ground (G401) • Faulty combination light switch • Faulty headlight relay • An open in the wire
Q7	RED/YEL	Combination light switch ON	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty combination light switch • An open in the wire

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

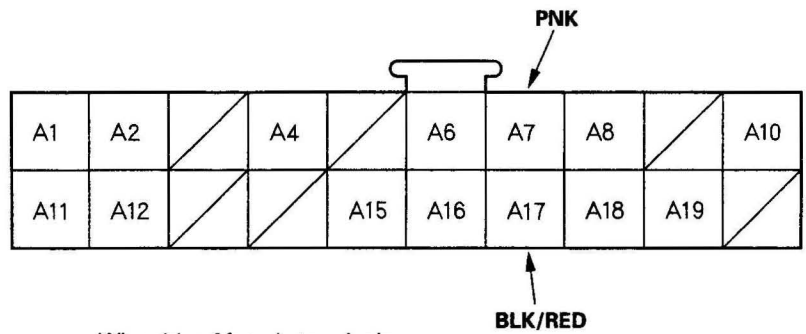
Multiplex Control Unit, Door:

6. Remove the driver's door panel, and disconnect the 20P connector from the door multiplex control unit.

7. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

MULTIPLEX CONTROL UNIT, DOOR CONNECTOR



Wire side of female terminals

8. Reconnect the connector to the door multiplex control unit, and make these input tests.

   - If a test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the control unit must be faulty; replace it.

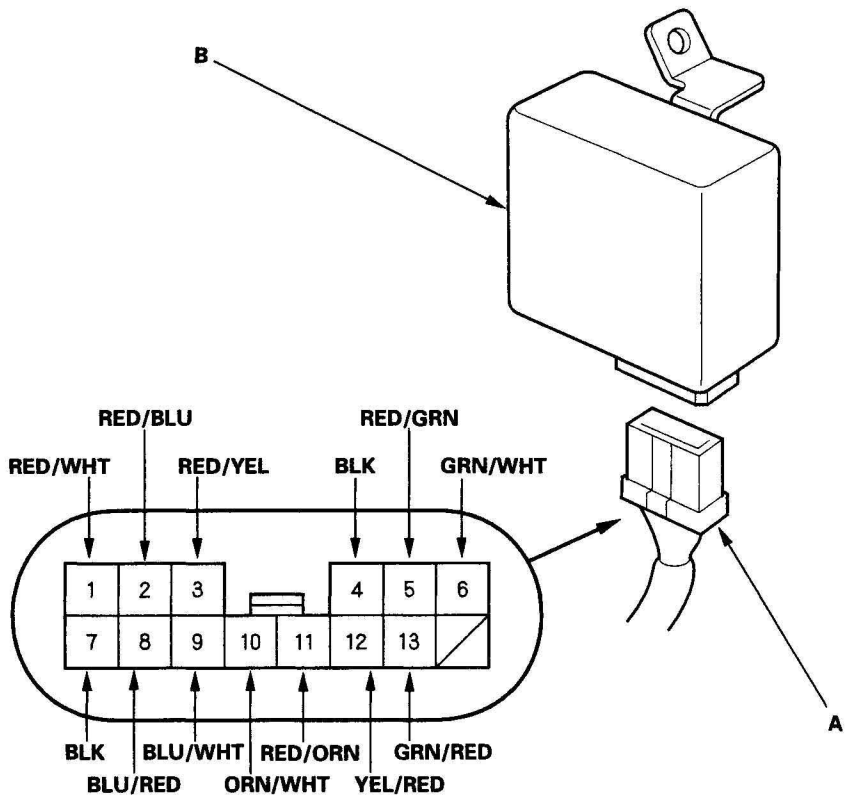
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A7	PNK	Driver's door lock knob locked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G401) • Faulty driver's door lock actuator • An open in the wire
		Driver's door lock knob unlocked	Check for voltage to ground: There should be 5 V or more.	• Poor ground (G401) • Faulty driver's door lock actuator • An open in the wire • Short to ground
A17	BLK/RED	Driver's door lock knob unlocked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G401) • Faulty driver's door lock actuator • An open in the wire
		Driver's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	• Poor ground (G401) • Faulty driver's door lock actuator • An open in the wire • Short to ground

BACK

Protected by AR

Daytime Running Lights Control Unit Input Test (Canada)

1. Remove the driver's dashboard lower cover (see page 20-65).
2. Disconnect the 14P connector (A) from the daytime running lights control unit (B).
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.



Wire side of female terminals

(cont'd)

Protected by AR

Daytime Running Lights Control Unit Input Test (Canada) (cont'd)

4. Make these input tests at the connector.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the control unit must be faulty; replace it.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	RED/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40 A) fuse in the under-hood fuse/relay box • Blown No. 10 (10 A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
12	YEL/RED	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
7	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
3	RED/YEL	Combination light switch ON (≣D)	Check for voltage to ground: There should be battery voltage.	• Blown No. 45 (20 A) fuse in the under-hood fuse/relay box • Faulty headlight relay 2 • Faulty combination light switch • An open in the wire
5	RED/GRN	Combination light switch ON (≣D)	Check for voltage to ground: There should be battery voltage.	• Blown No. 43 (20 A) fuse in the under-hood fuse/relay box • Faulty headlight relay 1 • Faulty combination light switch • An open in the wire
1	RED/WHT	Combination light switch ON (≣D), and dimmer switch in HIGH	Connect a jumper wire between No. 3 and No. 1 terminals Left headlight (HIGH) and high beam indicator light should come on.	• Blown bulb • Faulty high beam cut relay • Faulty combination light switch • Poor ground (G401) • An open in the wire
11	RED/ORN	Combination light switch ON (≣D), and dimmer switch in HIGH	Connect a jumper wire between No. 5 and No. 11 terminals. Right headlight (HIGH) should come on.	• Blown bulb • Faulty high beam cut relay • Faulty combination light switch • Poor ground (G401) • An open in the wire
10	ORN/WHT	Combination light switch ON (≣D), and dimmer switch in HIGH	Check for continuity to ground: There should be continuity.	• Faulty high beam cut relay • Faulty combination light switch • Poor ground (G401) • An open in the wire
6	GRN/WHT	Parking brake pedal	Check for continuity to ground: There should be continuity.	• Faulty parking brake switch • An open in the wire
8	BLU/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Faulty headlight relays • An open in the wire
9	BLU/WHT	Ignition switch ON (II)	Attach to ground: The DRL indicator light should come on.	• Blown bulb • An open in the wire
13	GRN/RED	Ignition switch ON (II)	Attach to ground: The brake system light should come on.	• Blown bulb • An open in the wire

BACK

Protected by AR

HID Lamp System Troubleshooting

⚠CAUTION

Never turn on the combination light switch before fitting the HID bulbs to their bulb sockets and completing the reassembly of the headlight assembly.

1. Check the No. 43 (20 A) and No. 45 (20 A) fuses in the under-hood fuse/relay box.

   Are the fuses OK?

   YES—Go to step 2.

   NO—Replace the fuse (s), and recheck. ■

2. Substitute a known-good HID bulb and turn the combination light switch ON.

   Does the headlight low beam come on?

   YES—Replace the original HID bulb. ■

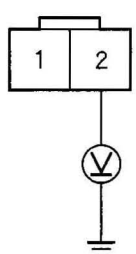
   NO—Go to step 3.

3. Disconnect the 2P connector from the inverter unit.

4. Turn the combination light switch ON.

5. Measure voltage between the No. 2 terminal of the inverter unit 2P connector and body ground.

INVERTER UNIT 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

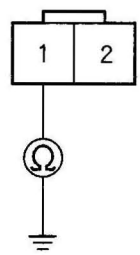
YES—Go to step 6.

NO—Repair open in the wire between the under-hood fuse/relay box and the inverter unit. ■

6. Turn the combination light switch OFF.

7. Check for continuity between the No. 1 terminal of the inverter unit 2P connector and body ground.

INVERTER UNIT 2P CONNECTOR



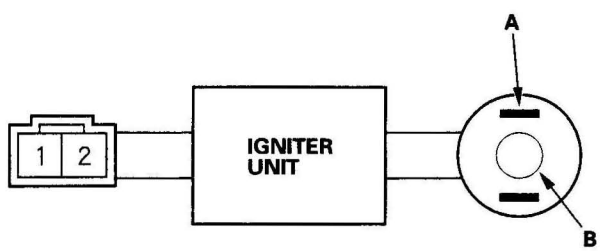
Wire side of female terminals

Is there continuity?

YES—Go to step 8.

NO—Repair open in the wire between the inverter unit and body ground. If the wire is OK, check for poor ground at G201 or G301. ■

8. Measure resistance between the No. 1 and B terminals and the No. 2 and A terminal of the igniter unit.



Is there about 1-2 Ω ?

YES—Substitute a known-good inverter, and recheck. If the symptom goes away, replace the original inverter unit. ■

NO—Replace the igniter unit. ■

Protected by AR

HID Bulb Removal

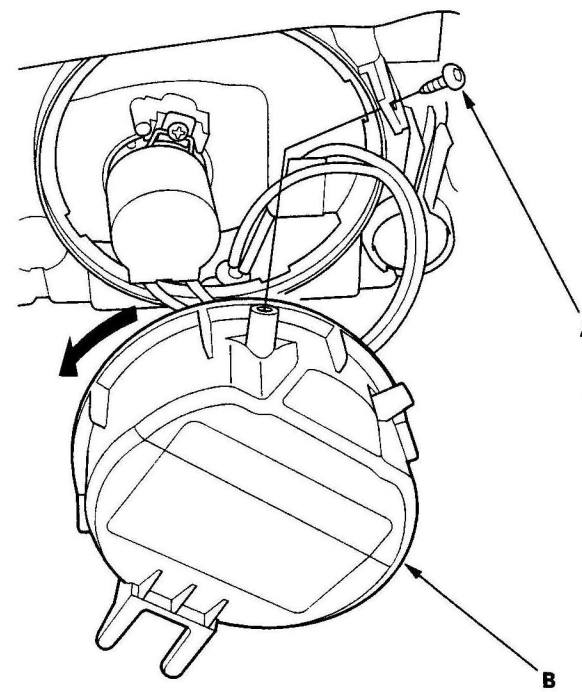
⚠ WARNING

A transient high tension (25,000 V) occurs at the bulb sockets of the high intensity discharge (HID) lamps when the combination light switch is turned ON. It may cause serious electrical shock or electrocution if you do not observe the cautions below.

⚠ CAUTION

- Never turn on the combination light switch before fitting the HID bulbs to their bulb sockets and completing the reassembly of the headlight assembly.
- Do not service the headlights assembly in wet conditions, such as rain or snow, near a sprinkler system, or when your hands are wet to prevent electrocution.
- Do not touch the surface of the HID bulbs with your bare hands and do not stain it with any oils and fats.
- Do not disassemble the inverter unit and the ignitor unit.
- Do not turn on the HID bulb by using a power source other than the battery mounted on your vehicle.

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons.
2. Combination light switch OFF.
3. Disconnect the battery negative cable, then disconnect the positive cable.
4. Disconnect the headlight assembly 2P connector.
5. Remove the Torx bolt (A) using a Torx T20 bit.

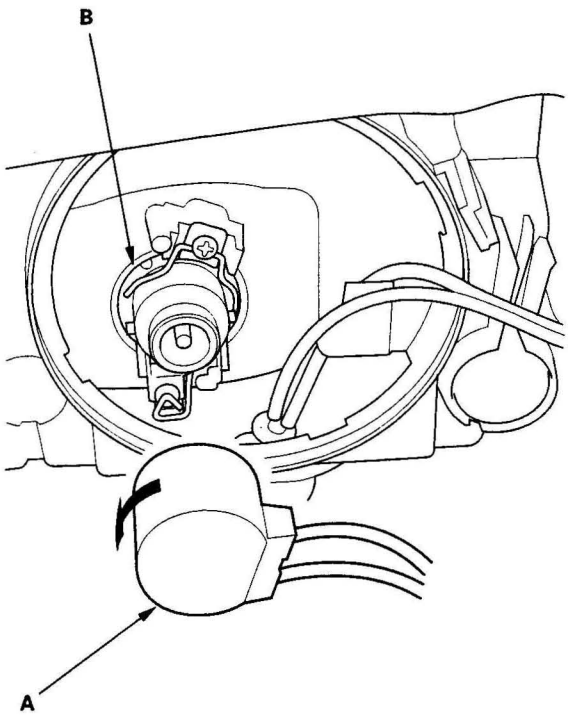


6. Turn the cover (B) 45° counterclockwise to remove it from the headlight assembly.

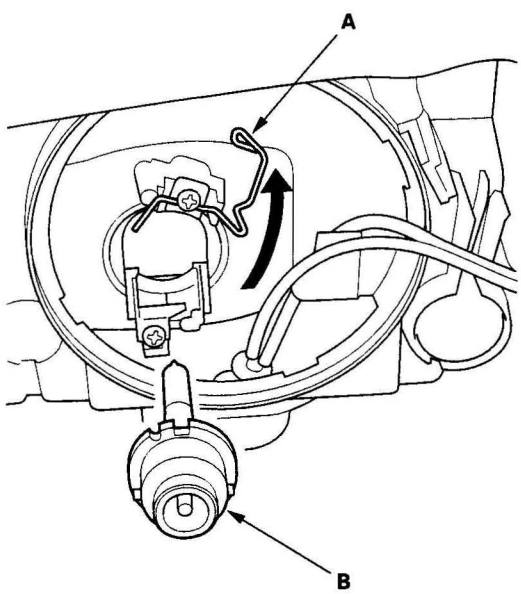
BACK

Protected by AR

7. Turn the socket (A) 45° counterclockwise to remove it from the bulb (B).



8. Pull the retaining spring (A) away from the bulb (B), then remove the bulb (B).



9. Install the new bulb in the reverse order of removal.

10. After reconnecting the battery, enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

Protected by AR

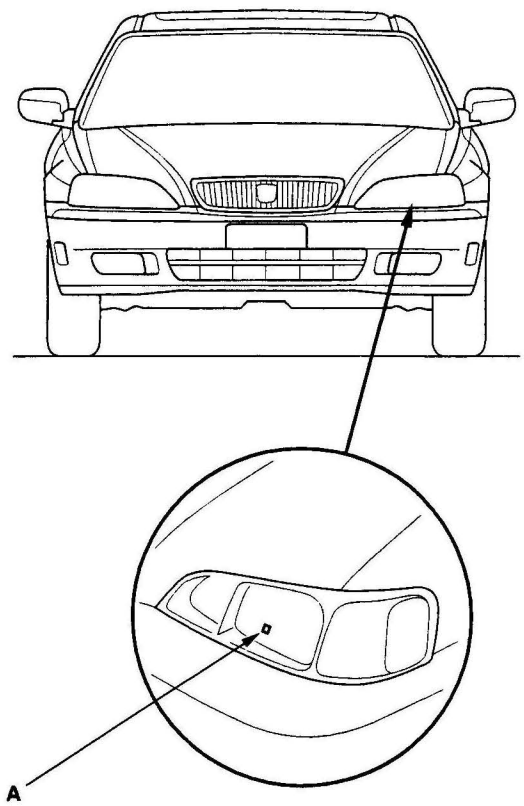
Headlight Adjustment

⚠CAUTION

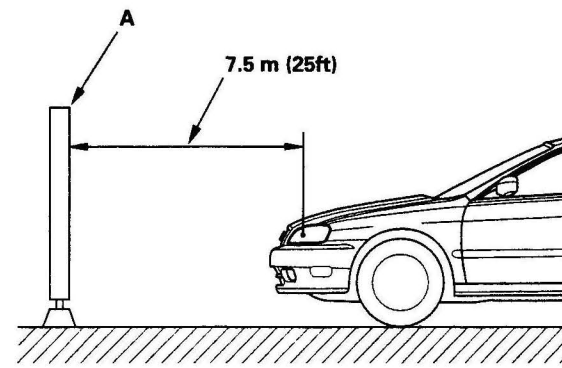
Headlights become very hot during use; do not touch them or any attaching hardware immediately after they have been turned off.

Before adjusting the headlights:
- Park the vehicle on a level surface.
- Make sure the tire pressures are correct.
- The driver or someone who weights the same should sit in the driver's seat.

1. Clean the outer lens so that you can see the center of the headlights (A).

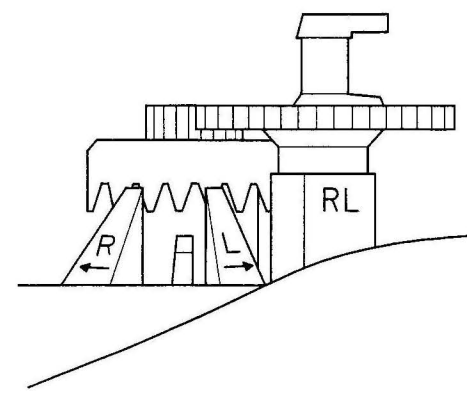


2. Park the vehicle 7.5 m (25 ft) away from a wall or a screen (A).



3. Open the hood.

4. '99-00 models: Check the horizontal angle gauge. The line on the adjustment screw indicator should line up with the mark on the gauge.



BACK

Protected by AR

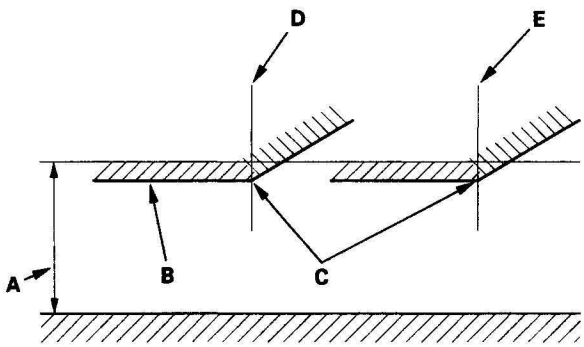
5. Turn the low beams on.

6. Determine if the headlights are aimed properly.

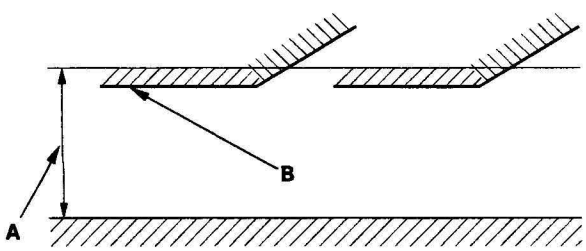
   Vertical adjustment:
   Measure the height of the headlights (A). The lights should reflect 52 mm (2.1 in.) below headlight height (B).

   Horizontal adjustment:('99-00 Models):
   The width of the refracting points (C) should be the same as the width of the headlight central points (D, E).

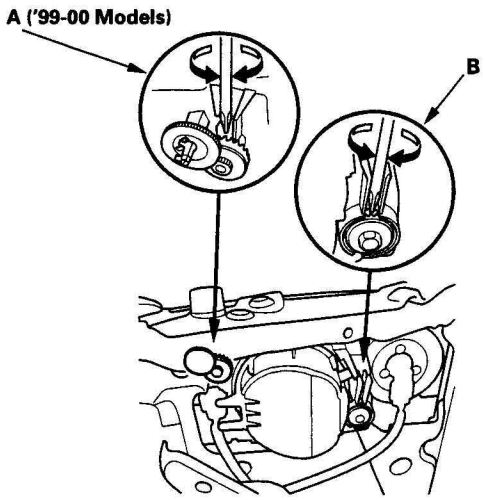
   '99-00 Models



   '01-03 Models



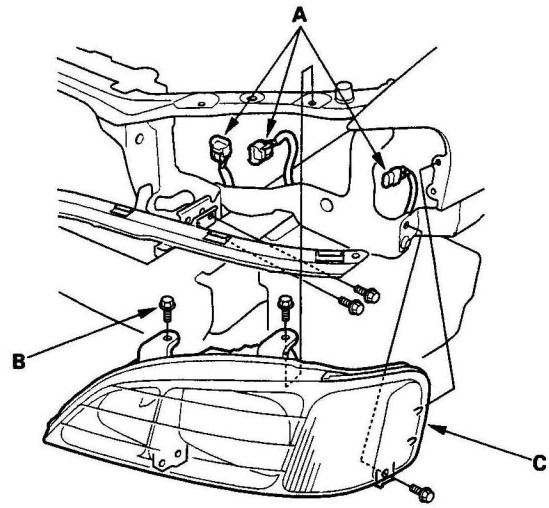
7. If necessary, adjust the headlights to local requirements by turning the horizontal adjuster '99-00 models (A) and the vertical adjuster (B).



Protected by AR

Headlight Replacement

1. Remove the front bumper (see page 20-101).
2. Disconnect the connectors (A).
3. Remove the five mounting bolts (B), then remove the headlight assembly (C).



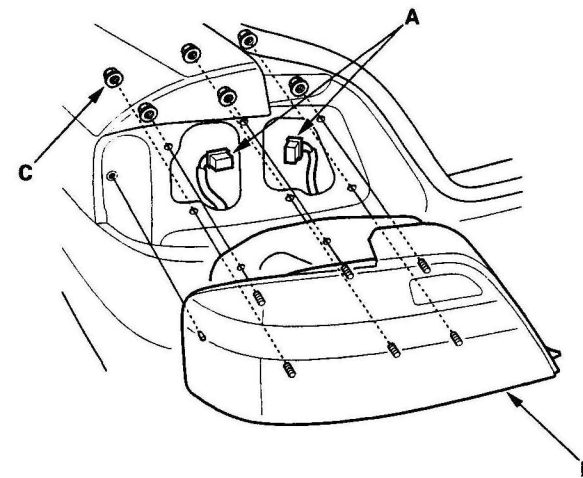
Headlight (high):60 W
(low): 35 W
Front Turn Signal/
Side Marker Light: 27/8 W

4. Install the headlight in the reverse order of removal.
5. After replacement, adjust the headlights to local requirements.

Taillight Replacement

1. Open the trunk lid and pull back the trunk side trim panel (see page 20-58).
2. Disconnect the connectors from the taillight (B).

Brake/Taillight: 21/5 W
Turn Signal Light: 21 W
Back-up Light: 18 W



3. Remove the six mounting nuts (C), then pull out the taillight.
4. Install the taillight and note these items:
   - Inspect the gasket; replace it if it is distorted or stays compressed.
   - After installing the taillights, run water over them to make sure they do not leak.

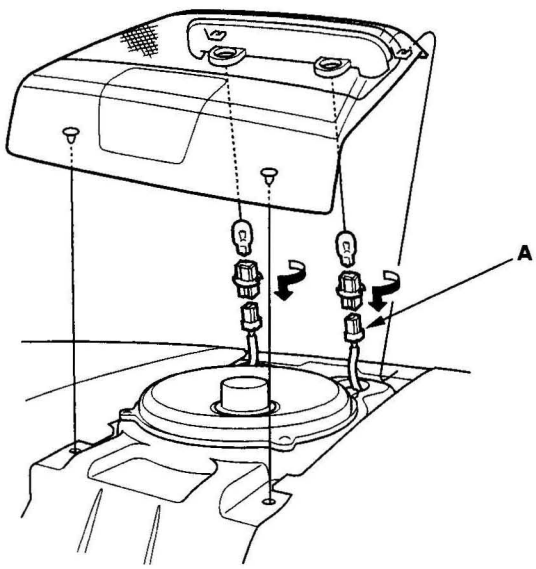
BACK

Protected by AR

High Mount Brake Light Replacement

1. Remove the rear speaker grille.
2. Disconnect the 2P connector (A) from the high mount brake light.
3. Remove both bulbs from the light.

High Mount Brake Light Bulb: 21W x 2

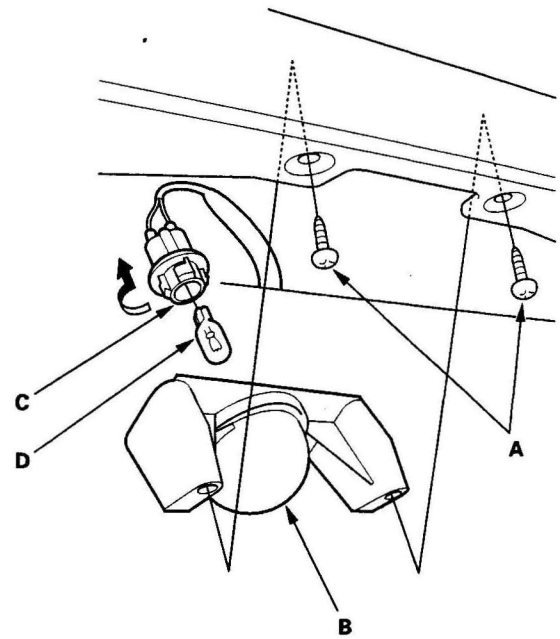


4. Push the light rearward to release the clips.
5. Pull the light.
6. Clean the rear window and install the light in the reverse order of removal.

License Plate Light Replacement

1. Remove the two screws (A), and pull the license plate light (B) off.

License Plate Light Bulb: 5W



2. Turn the bulb socket (C) 45° counterclockwise, remove it from the light, then replace the bulb (D).

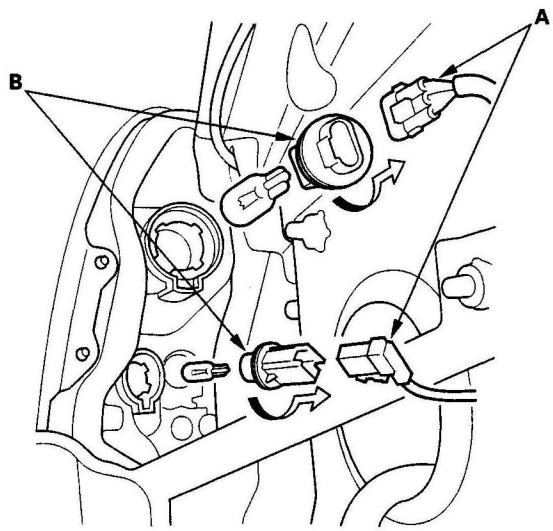
Protected by AR

Bulb Replacement

Front Turn Signal/Parking Lights: Front Side Marker Light:

1. Remove the inner fender (see page 20-129).
2. Disconnect the connectors (A) from the lights.

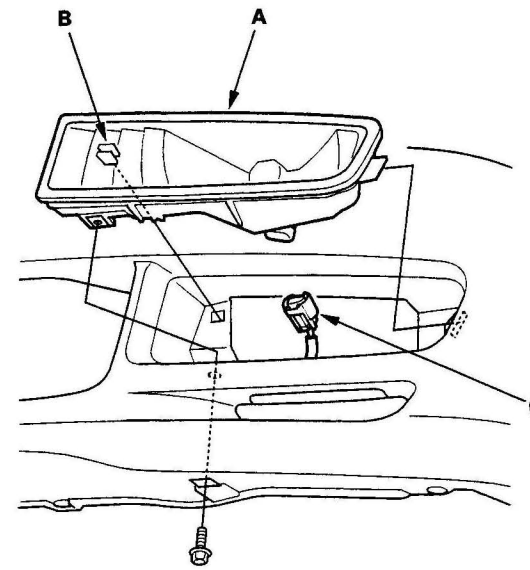
FRONT TURN SIGNAL/PARKING LIGHT: 24/5 W
FRONT SIDE MARKER LIGHT: 5 W



3. Turn the bulb socket (B) 45° counterclockwise to remove them from the housing.
4. Install the new bulb(s) in the reverse order of removal.

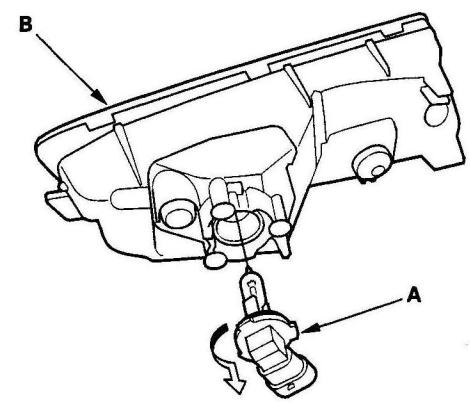
Fog Light Replacement

1. Remove the mounting bolt from the fog light (A).



2. Release the hook (B) from the fog light.
3. Disconnect the 2P connector (C) and remove the fog light assembly.
4. Turn the bulb socket (A) 45° counterclockwise to remove it from the housing (B).

FOG LIGHT: 51 W



BACK

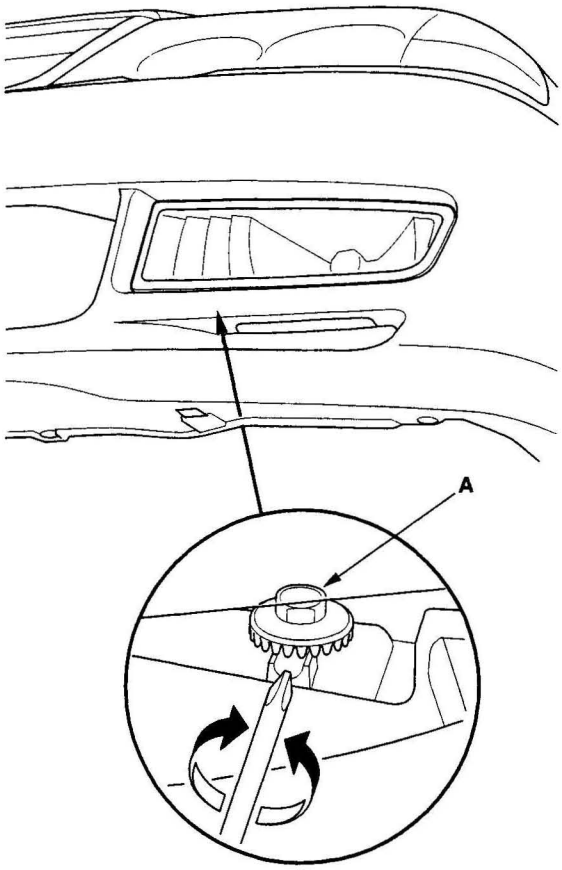
Protected by AR

Fog Light Adjustment

'02-03 Models

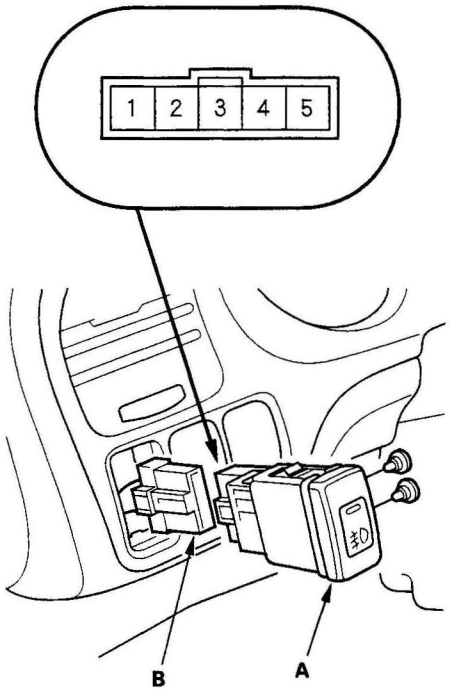
Before adjusting the headlights:
- Park the vehicle on a level surface.
- Make sure the tire pressures are correct.
- The driver or someone who weights the same should sit in the driver's seat.

Adjust the fog lights to local requirements by turning the adjuster (A).



Fog Light Switch Test/Replacement

1. Remove the driver's dashboard lower cover. (see page 20-65).
2. Carefully push the fog light switch (A) out from behind the dashboard.



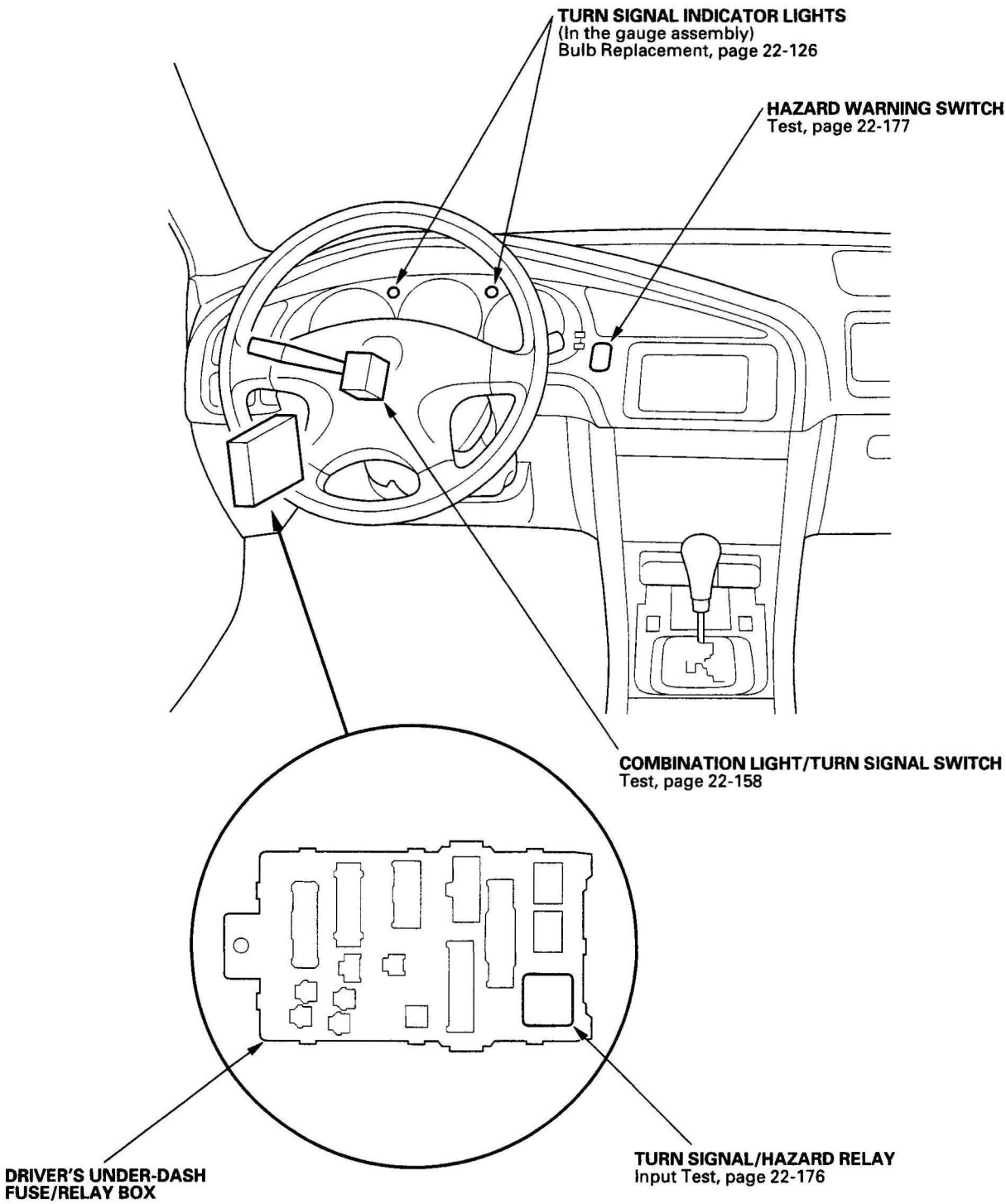
3. Disconnect the 5P connector (B) from the switch.
4. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1		2	3	4		5
ON	○	⊙	○	○			
OFF	○	⊙	○				

Protected by AR

Turn Signal/Hazard Flasher

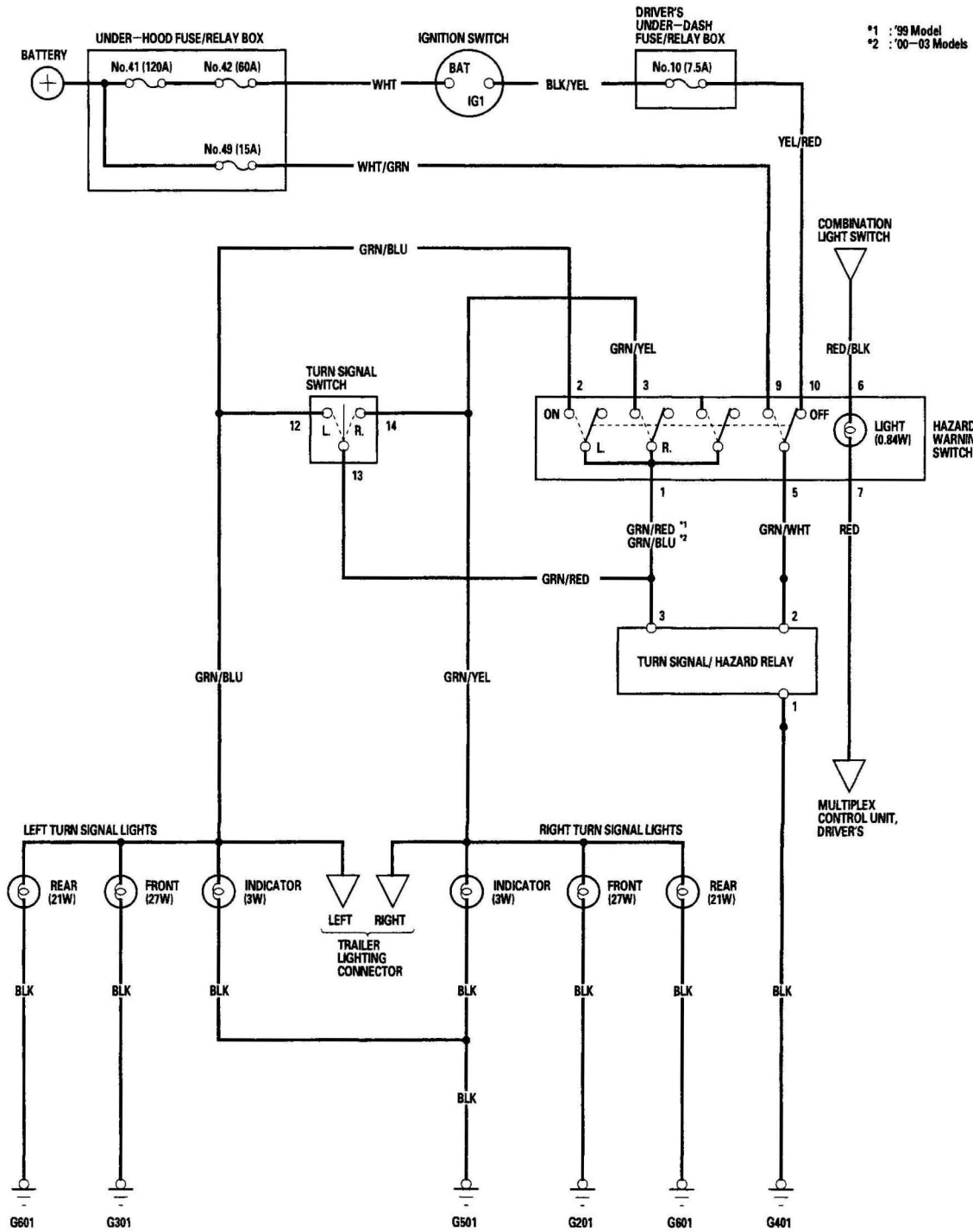
Component Location Index



BACK

Protected by AR

Circuit Diagram

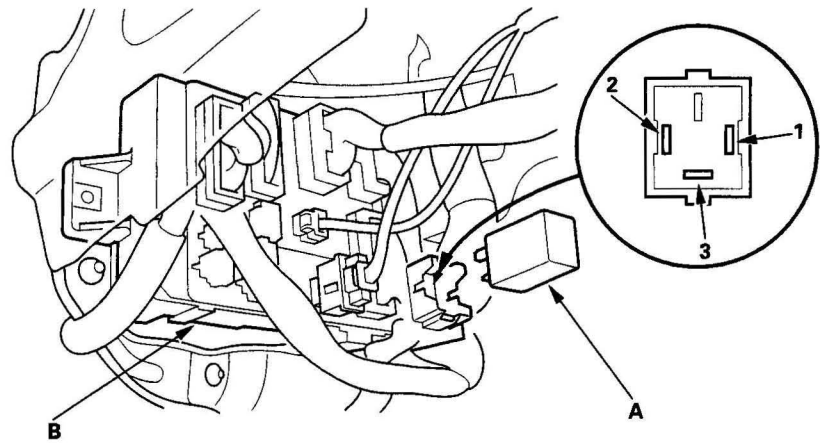


Protected by AR

Turn Signal/Hazard Flasher

Turn Signal/Hazard Relay Input Test

1. Remove the turn signal/hazard relay (A) from the driver's under-dash fuse/relay box (B).
2. Inspect the relay and fuse/relay box socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 3.



3. Make these input tests at the fuse/relay box.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the turn signal/hazard relay must be faulty; replace it.

Cavity	Test condition	Test: Desired result	Possible cause if result is not obtained
1	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
2	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 10 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty turn signal switch • An open in the wire
	Hazard warning switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 49 (15 A) fuse in the under-hood fuse/relay box • Faulty hazard warning switch • An open in the wire
3	Ignition switch ON (II) and turn signal switch in Right or Left position	Connect No. 2 terminal to No. 3 terminal: Right or left turn signal lights should come on.	• Poor ground (G201, G301, G501, G601) • Faulty turn signal switch • An open in the wire
	Hazard warning switch ON	Connect No. 2 terminal to No. 3 terminal: Hazard warning lights should come on.	• Poor ground (G201, G301, G501, G601) • Faulty hazard warning switch • An open in the wire

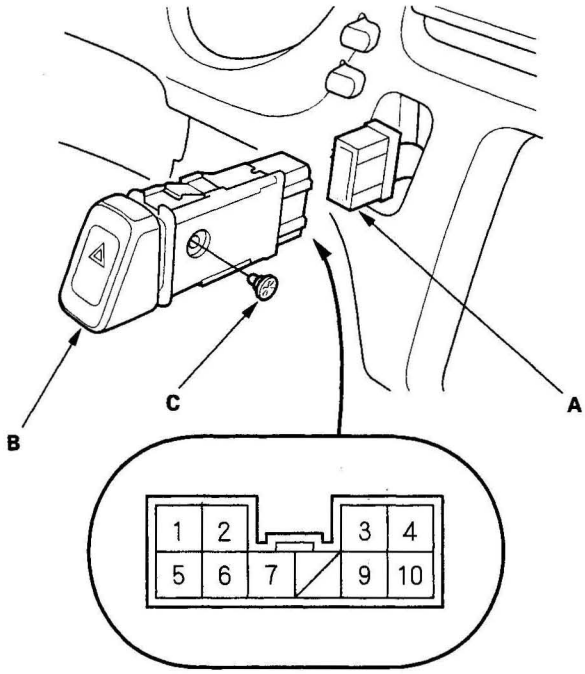
BACK

Protected by AR

Hazard Warning Switch Test

With Navigation System:

1. Remove the instrument panel. (see page 20-65).
2. Disconnect the 10P connector (A) from the hazard warning switch (B).



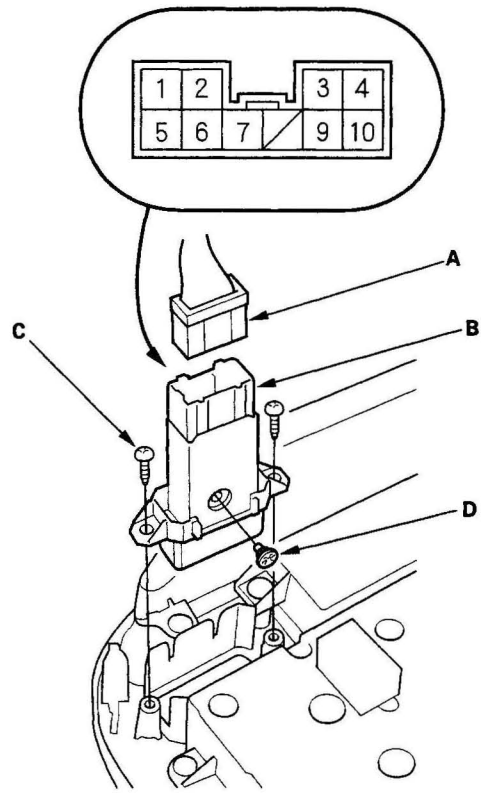
3. Pull the hazard warning switch out from the instrument panel.
4. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	6		7	1	2	10	9	3	5
OFF	○	●	○			○			○
ON	○	●	○	○	○			○	
							○		○

5. If necessary, check the illumination bulb (C).

Without Navigation System:

1. Remove the instrument panel (see page 20-65).
2. Disconnect the 10P connector (A) from the hazard warning switch (B).



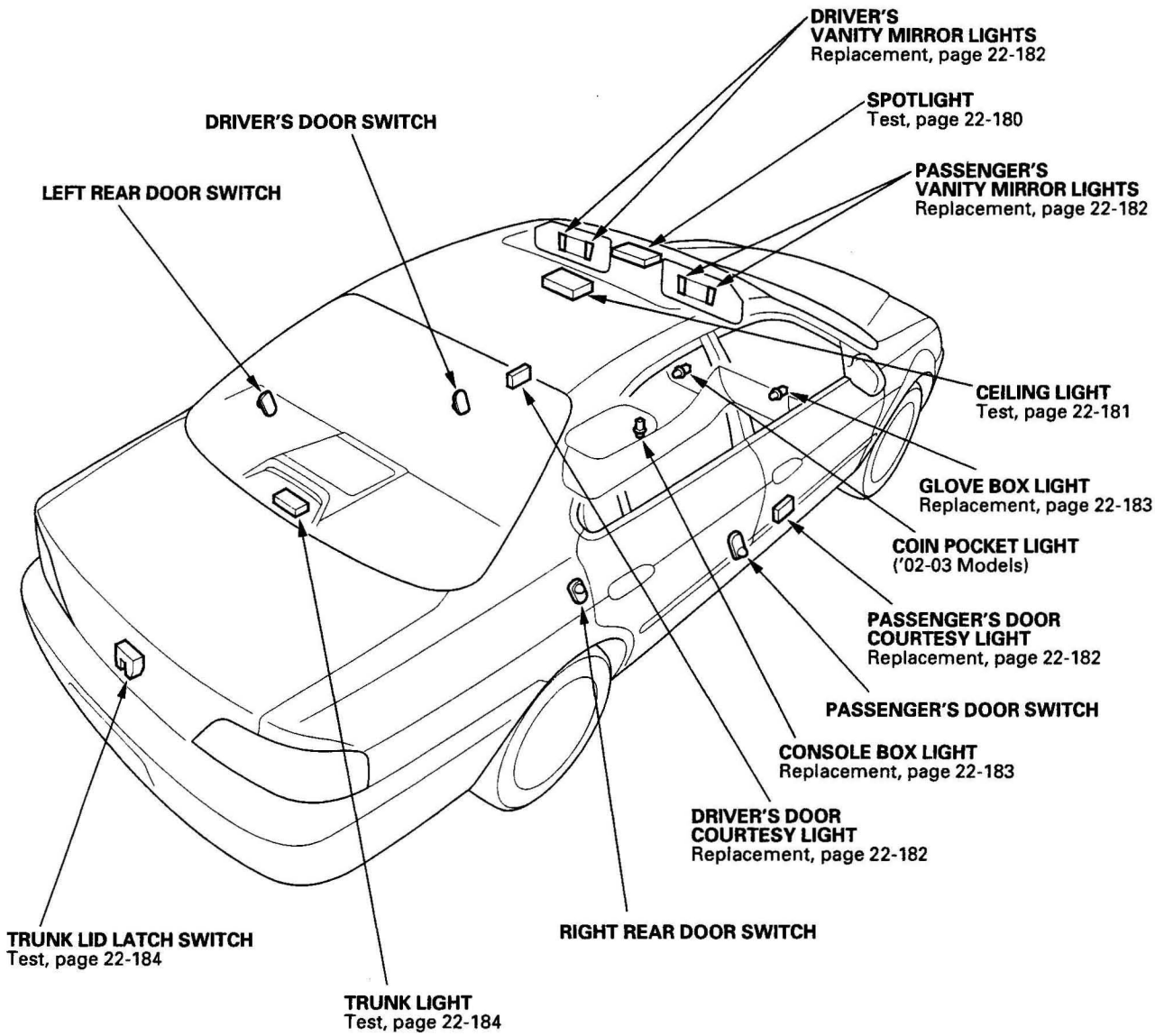
3. Remove the two mounting screws (C).
4. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	6		7	1	2	10	9	3	5
OFF	○	●	○			○			○
ON	○	●	○	○	○			○	
							○		○

5. If necessary, check the illumination bulb (D).

Protected by AR

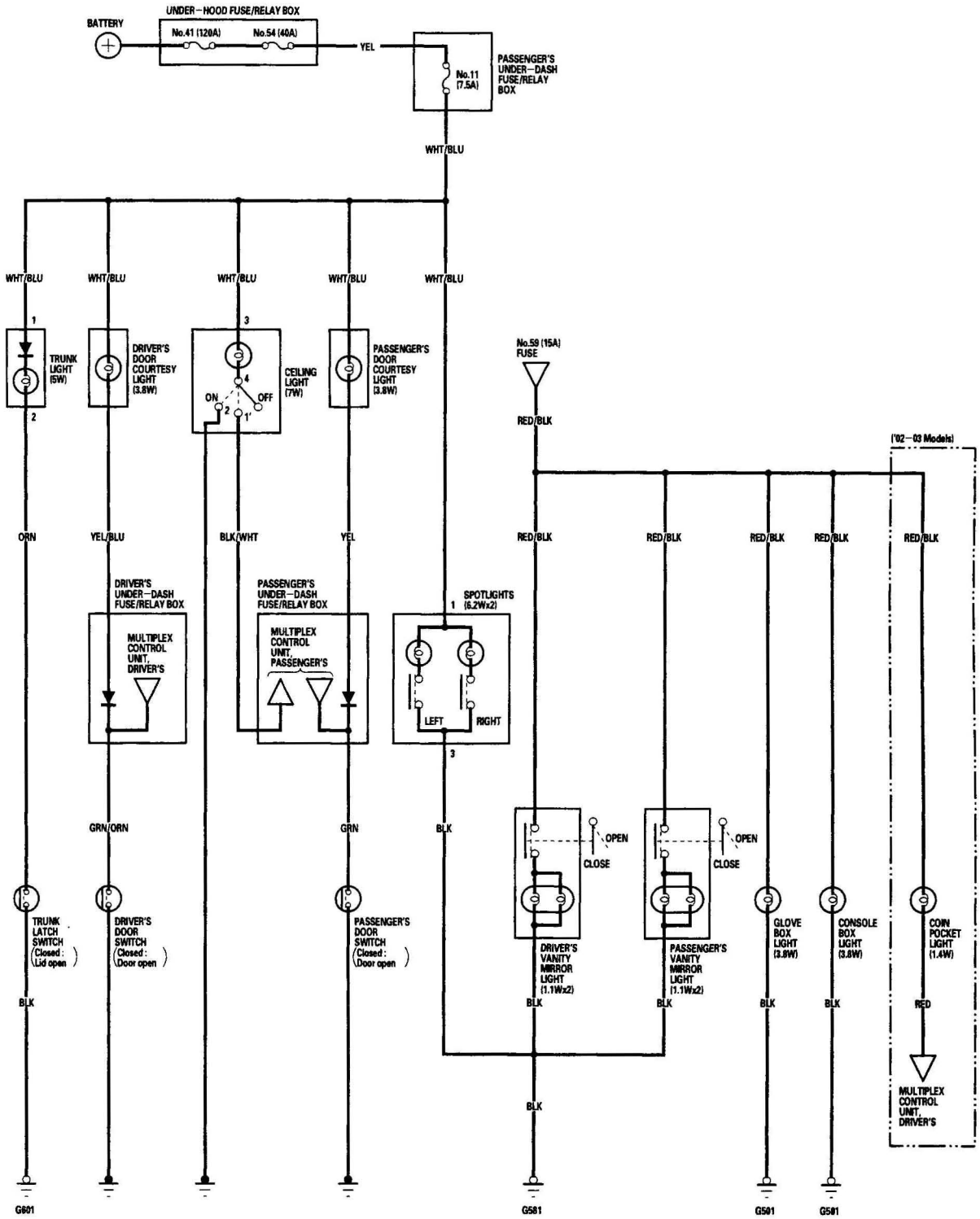
Component Location Index



BACK

Protected by AR

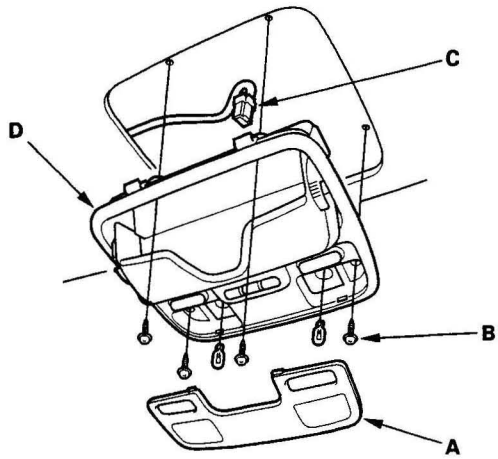
Circuit Diagram



Protected by AR

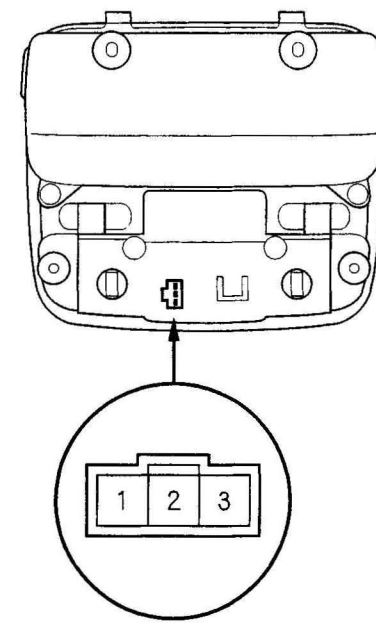
Spotlight Test

1. Carefully pry off the lens (A) with a small screwdriver.



2. Remove the four mounting screws (B).
3. Disconnect the 3P connector (C) from the housing (D).
4. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position		1		3
LEFT	ON	○	⊕	○
	OFF			
RIGHT	ON	○	⊕	○
	OFF			



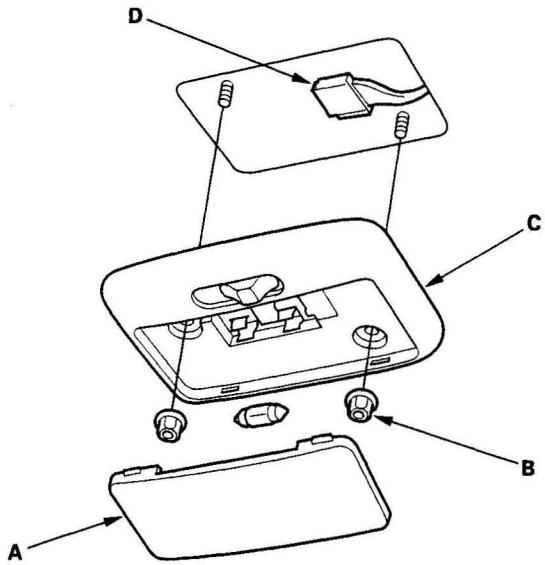
5. If the continuity is not as specified, check the bulbs. If the bulb are OK, replace the spotlights.

BACK

Protected by AR

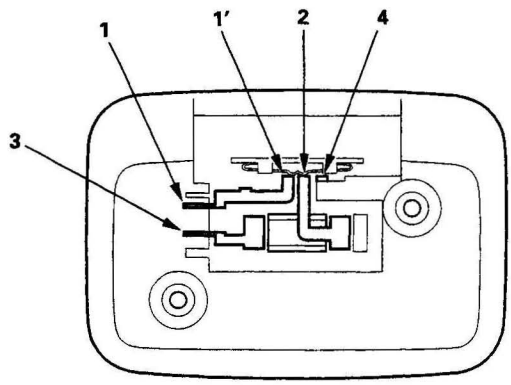
Ceiling Light Test

1. Turn the light switch OFF.
2. Carefully pry off the lens (A) with a small screwdriver.



3. Remove the two mounting nuts (B) and the housing (C).
4. Disconnect the 3P connector (D) from the housing.
5. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1 or 1'	2	4		3
OFF			○	○	○
MIDDLE	○		○	○	○
ON		○	○	○	○



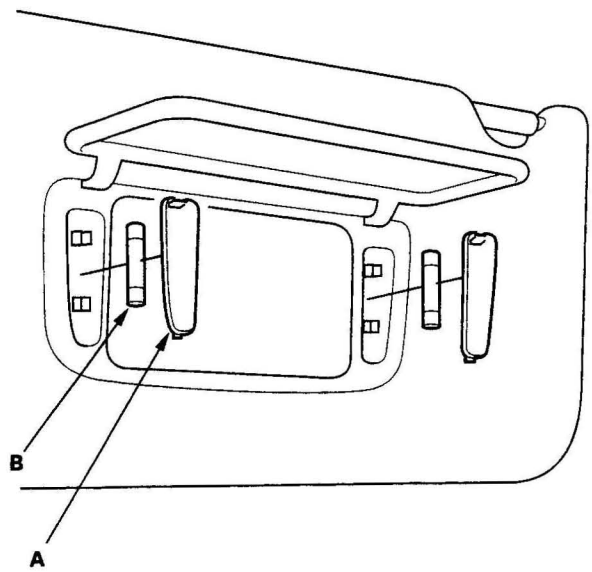
6. If the continuity is not as specified, check the bulb. If the bulb is OK, replace the ceiling light.

Protected by AR

Vanity Mirror Lights Replacement

1. Open the sunvisor.
2. Carefully pry off the lens (A) with a small screwdriver.

   Vanity Mirror Light: 1.1W

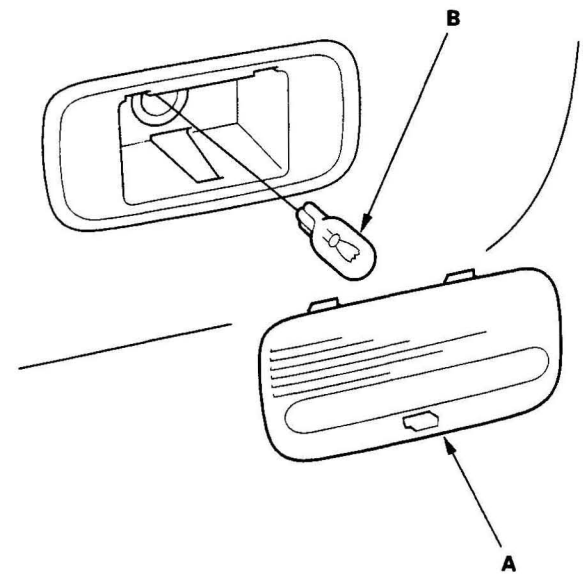


3. Remove the bulb (B) from the socket.

Courtesy Light Replacement

1. Carefully pry off the lens (A) with a small screwdriver.

   Courtesy Light: 3.8W



2. Remove the bulb (B) from the socket.

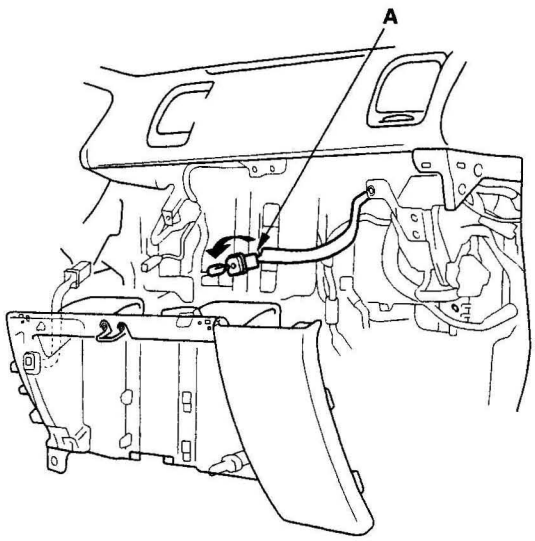
BACK

Protected by AR

Glove Box Light Replacement

1. Remove the glove box (see page 20-66).
2. Turn the bulb socket 45° counterclockwise from the light housing, then remove the bulb (A).

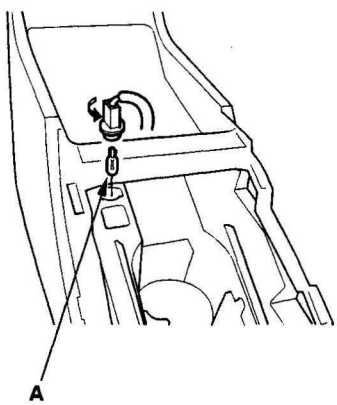
Glove Box Ligtht: 3.8W



Console Box Light Replacement

1. Remove the rear console (see page 20-62).
2. Disconnect the 3P connector from the rear accessory socket sub-harness.
3. Remove the beverageholder cover from the center console.
4. Turn the bulb socket 45° counterclockwise from the light housing, then remove the bulb (A).

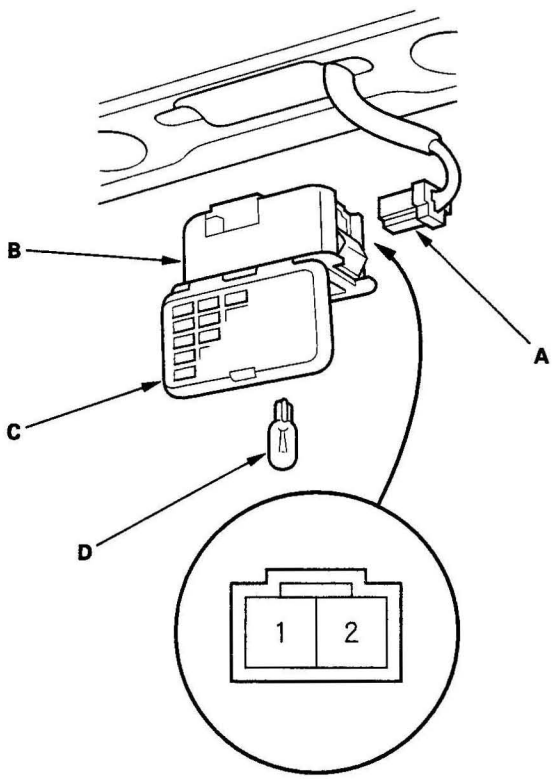
Console Box Light: 3.8W



Protected by AR

Trunk Light Test

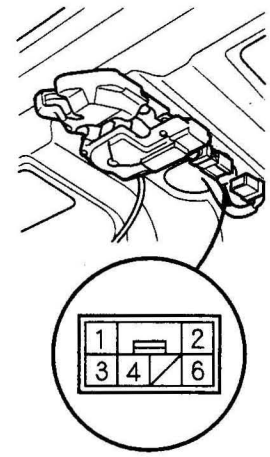
1. Open the trunk lid.
2. Pry out the trunk light assembly.
3. Disconnect the 2P connector (A) from the housing (B).



4. Open the trunk light cover (C).
5. Make sure that the bulb (D) is OK, then Check for continuity between the No. 1 and No. 2 terminals. If there is no continuity, replace the trunk light.

Trunk Latch Switch Test

1. Open the trunk lid.
2. Disconnect the 6P connector from the trunk lid latch.



3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1	4
OPEN	○	○
CLOSED		

4. If the continuity is not as specified, replace the trunk latch switch.

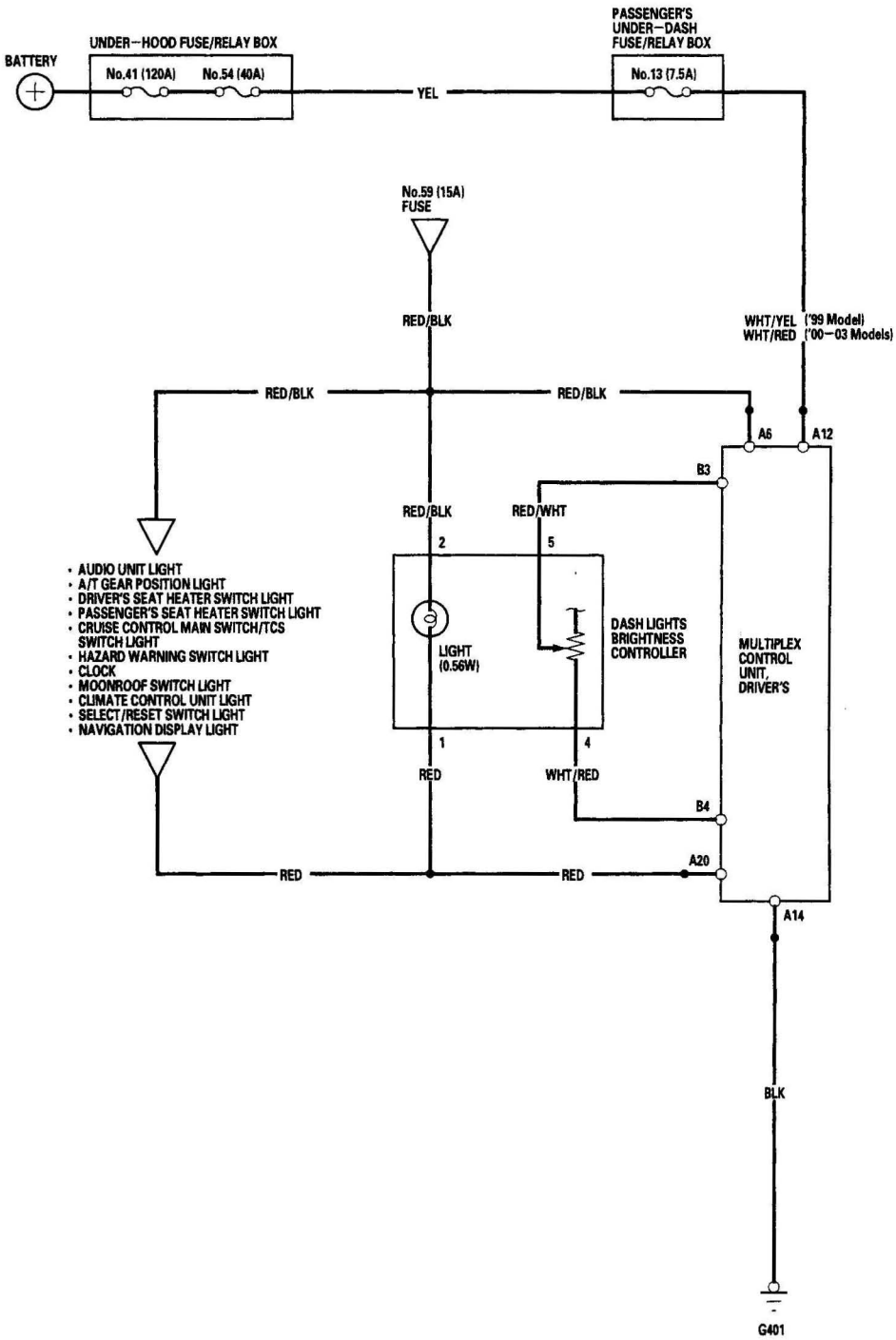
BACK

Protected by AR

Dash Lights Brightness Controller

BODY

Circuit Diagram



BACK

Protected by AR

Dash Lights Brightness Controller

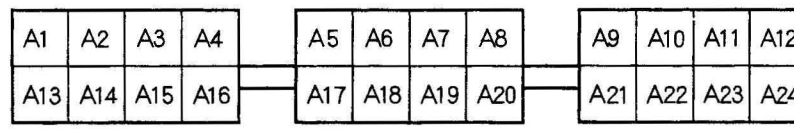
Control Unit Input Test

1. Before testing the dash lights brightness control functions, troubleshoot the multiplex control system (see page 22-298).

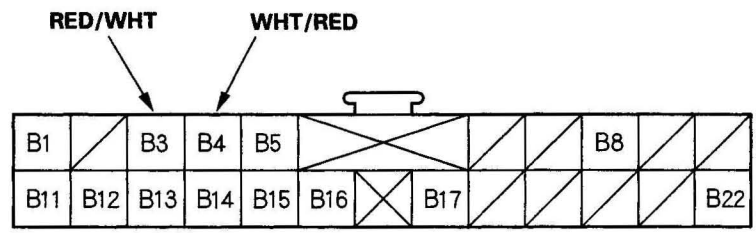
Multiplex Control Unit, Driver's:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

FUSE/RELAY BOX SOCKET

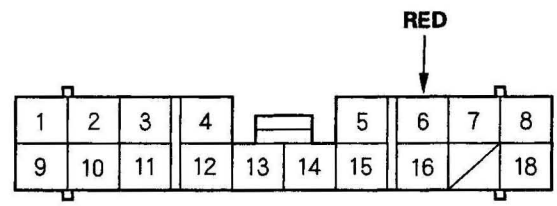


MULTIPLEX CONTROL UNIT, DRIVER'S CONNECTOR B



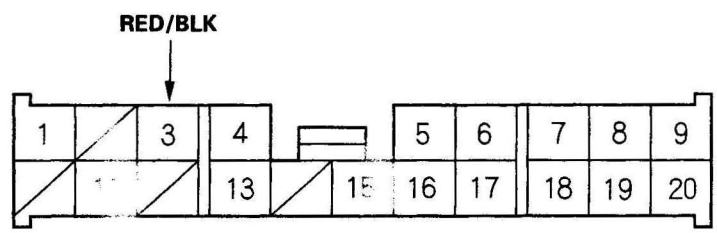
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR I



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR O



Wire side of female terminals

BACK

Protected by AR

4. With the driver's multiplex control unit still disconnected, make these input tests at the connector and driver's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK,go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
A14		Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
B3 · B4	RED/WHT and WHT/RED	Adjusting dial rotated	Check for resistance between the B3 and B4 terminals: There should be 0-20 kΩ.	• Faulty dash lights brightness controller • An open in the wire

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the driver's under-dash fuse/relay box.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the control unit must be faulty; replace it.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
O3	RED/BLK	Combination light switch ON (≡DC≡) or (≡D)	Check for voltage to ground: There should be battery voltage.	• Blown No. 59 (15A) fuse in the under-hood fuse/relay box • Faulty combination light switch • An open in the wire
I6	RED	Combination light switch ON (≡DC≡) or (≡D)	Attach to ground: Dash lights should come on full bright.	• An open in the wire

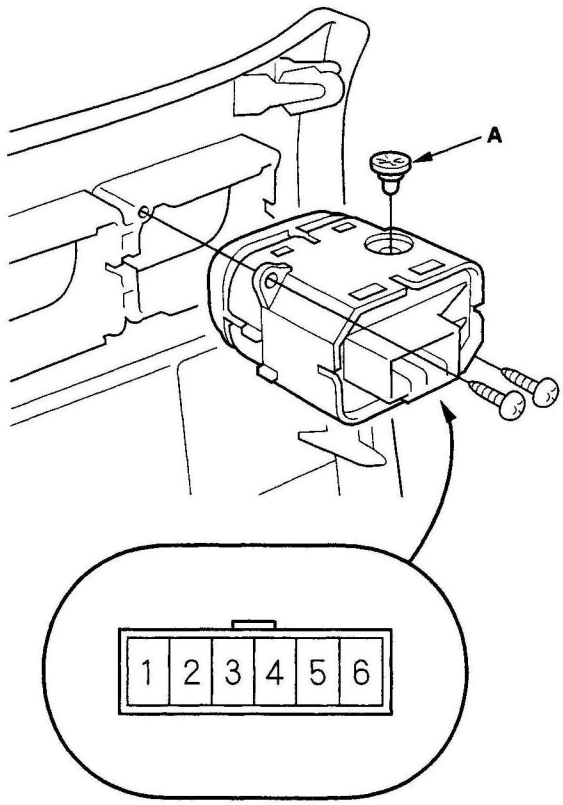
Protected by AR

Dash Lights Brightness Controller

Controller Test

1. Remove the dashboard lower cover (see page 20-65).

2. Disconnect the 6P connector from the controller.



3. Measure resistance between the No. 4 and No. 5 terminals while rotating the adjusting dial. Resistance should vary from 0 to 20K ohms as the dial is rotated.

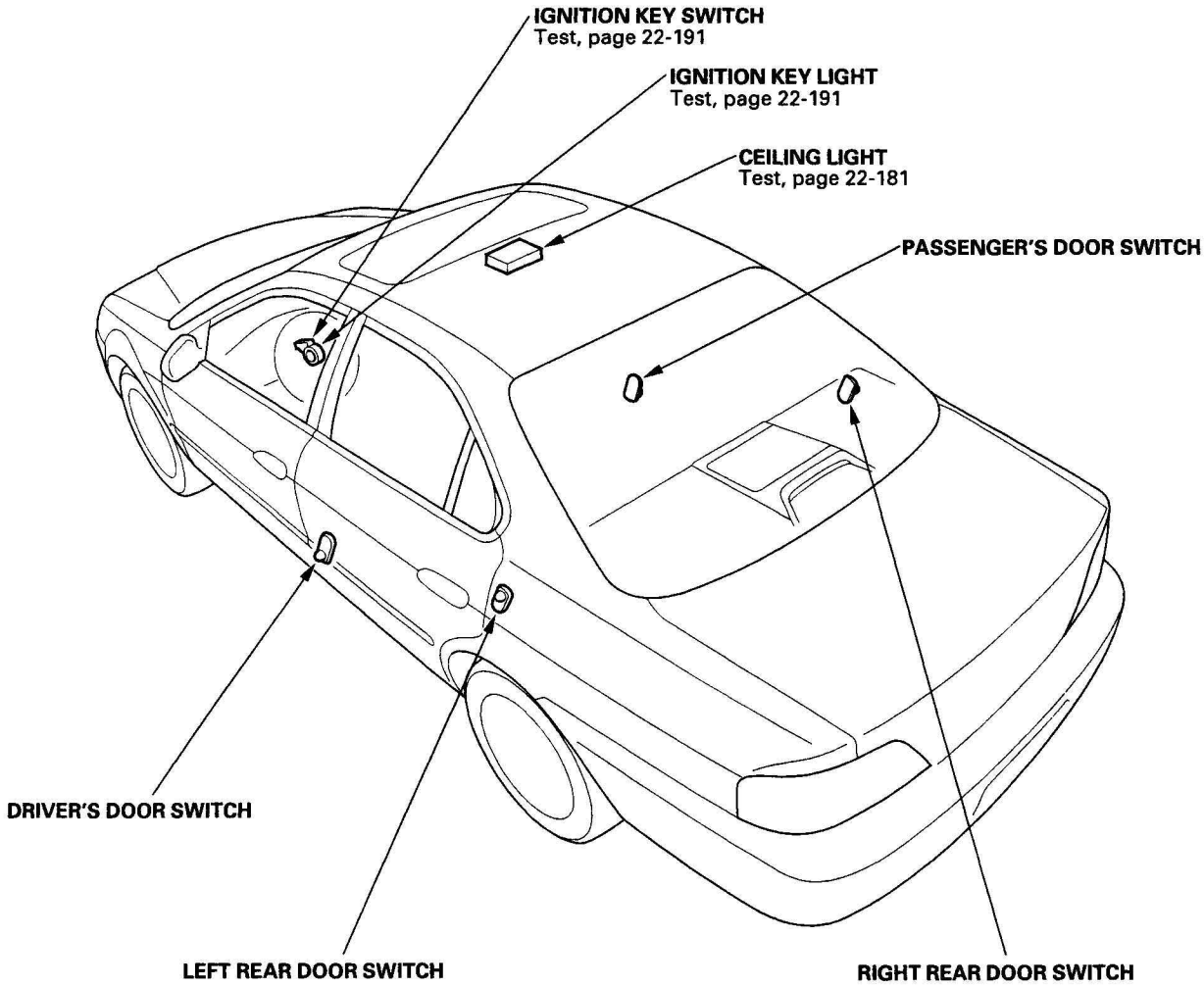
4. If necessary, check the illumination bulb (A).

BACK

Protected by AR

Entry Light Control System

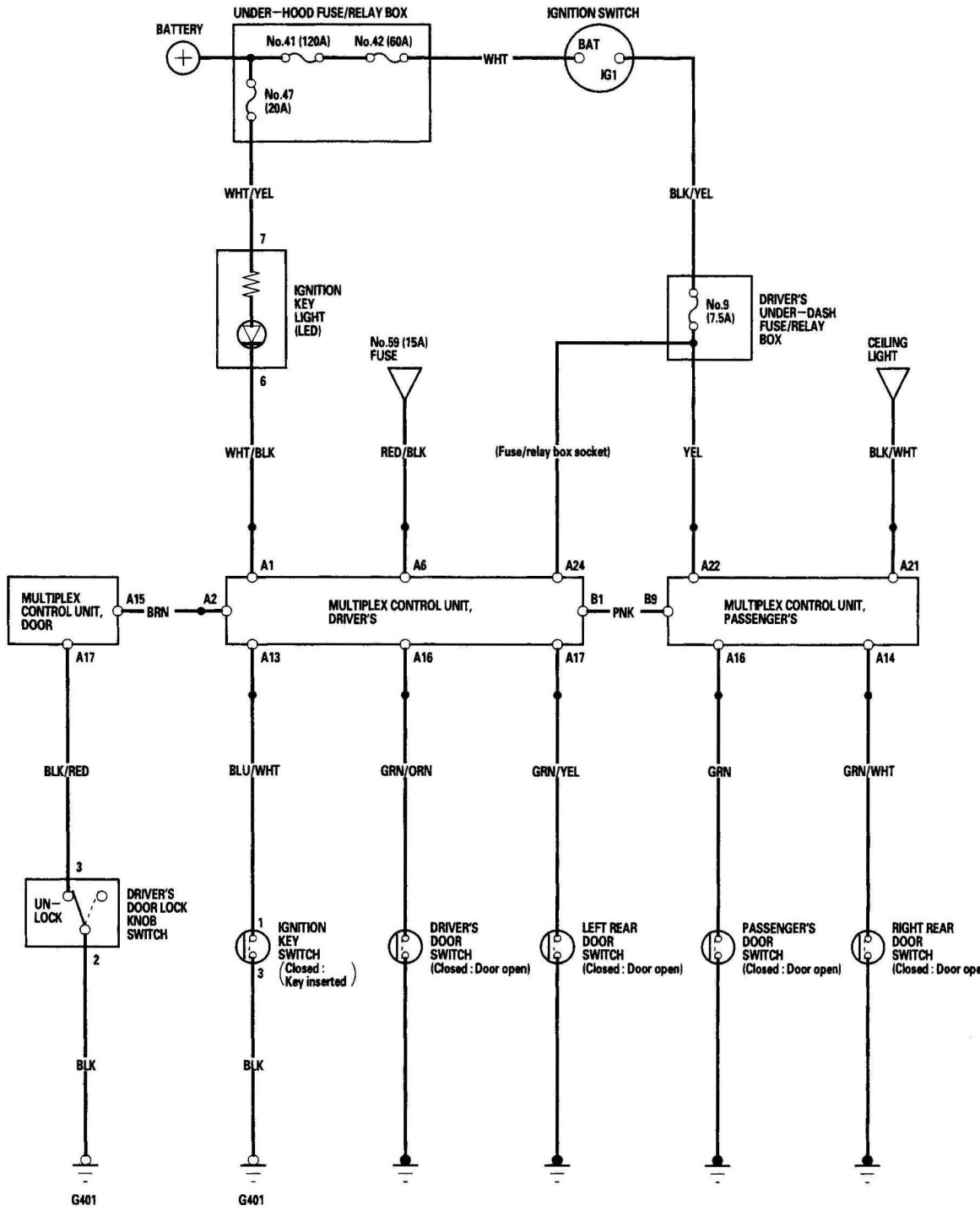
Component Location Index



Protected by AR

Entry Light Control System

Circuit Diagram



BACK

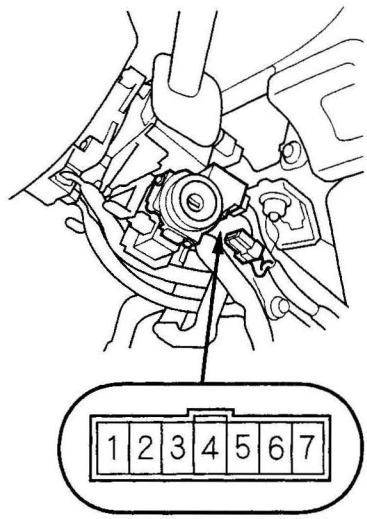
Protected by AR

Ignition Key Switch Test

NOTE: For more key-in beeper information, refer to the circuit diagram (see page 22-190) and input test (see page 22-192).

When the ignition key is not removed, the key-in beeper in the driver's multiplex control unit senses ground through the closed ignition key switch. When you open the driver's door, the beeper circuit senses ground through the closed door switch.

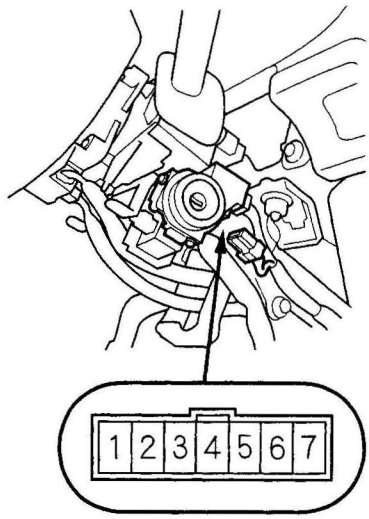
1. Remove the steering column upper and lower covers (see page 17-27).
2. Disconnect the 7P connector.



3. Check for continuity between the No. 1 and No. 3 terminals.
   - There should be continuity with the key in the ignition switch.
   - There should be no continuity with the key removed.
4. If the continuity is not as specified, replace the ignition key switch.

Ignition Key Light Test

1. Remove the steering column upper and lower covers (see page 17-27).
2. Disconnect the 7P connector.



3. The LED should come on when power is connected to the No. 7 terminal and ground is connected to No. 6 terminal.
4. If the LED does not come on, replace the ignition key switch.

Protected by AR

Entry Light Control System

Control Unit Input Test

1. Before testing the entry light control functions, troubleshoot the multiplex control system (see page 22-298).

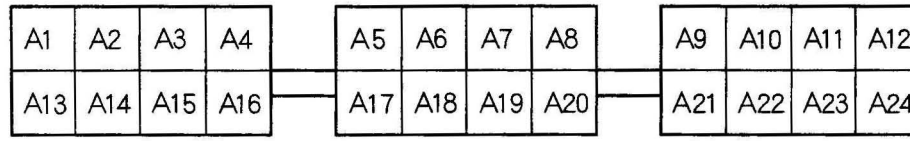
Multiplex Control Unit, Driver's:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.

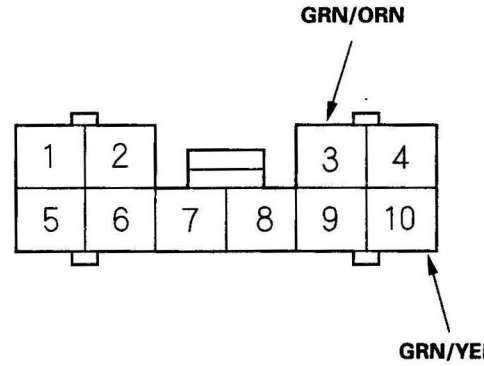
3. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

FUSE/RELAY BOX SOCKET

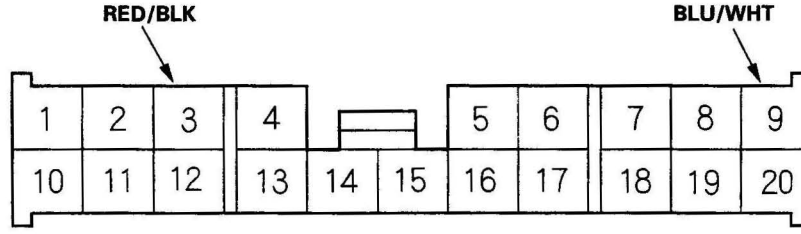


DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR O



Wire side of female terminals

BACK

Protected by AR

4. With the driver's multiplex control unit still disconnected, make these input tests at the connector or driver's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	Fuse/relay box socket	Under all conditions	Attach to ground: The ignition key light should come on.	• Blown No. 47 (20 A) fuse in the under-hood fuse/relay box • Blown LED • Faulty driver's fuse/relay box
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the back of the driver's under-dash fuse/relay box.
   For driver's under-dash fuse/relay box connector socket location (see page 22-93).

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
O3	RED/BLK	Combination light switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 59 (15A) fuse in the under-hood fuse/relay box • Faulty taillight relay. • Faulty combination light switch • An open in the wire
O9	BLU/WHT	Ignition key is in the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition switch • An open in the wire
		Ignition key is out of the ignition switch	Check for voltage to ground: There should be 5 V or more.	• Faulty ignition switch • Short to ground
A3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	
A10	GRN/YEL	Left rear door open	Check for voltage to ground: There should be 1 V or less.	• Faulty left rear door switch • An open in the wire
		Left rear door closed	Check for voltage to ground: There should be 5 V or more.	

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

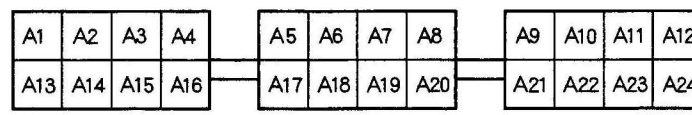
Multiplex Control Unit, Passenger's:

6. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

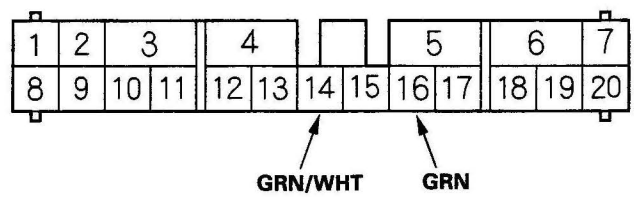
7. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

FUSE/RELAY BOX SOCKET



PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



Wire side of female terminels

BACK

Protected by AR

8. With the passenger's multiplex control unit still disconnected, make these input tests at the connector and passenger's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 9.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A22	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A21		Ceiling light switch in the middle position	Attach to ground: Ceiling light should come on.	• Blown No. 11 (7.5 A) fuse in the passenger's under-dash fuse/ relay box • Faulty ceiling light • An open in the wire

9. Reconnect the passenger's multiplex control unit to the passenger's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the back of the passenger's under-dash fuse/relay box.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 10.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A16	GRN	Passenger's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty passenger's door switch • An open in the wire
		Passenger's door closed	Check for voltage to ground: There should be 5 V or more.	
A14	GRN/WHT	Right rear door open	Check for voltage to ground: There should be 1 V or less.	• Faulty right rear door switch • An open in the wire
		Right rear door closed	Check for voltage to ground: There should be 5 V or more.	

(cont'd)

Protected by AR

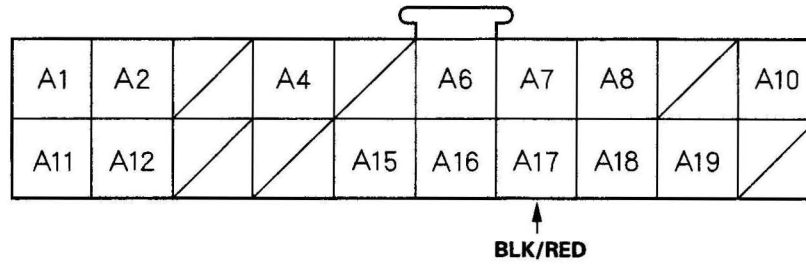
Control Unit Input Test (cont'd)

Multiplex Control Unit, Door:

10. Remove the driver's door panel and disconnect the 20P connector from the door multiplex control unit.

11. Inspect all connector and socket terminals to be sure they are making good contact.

    - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
    - If the terminals look OK, go to step 12.



Wire side of female terminals

12. Reconnect the connector to the door multiplex control unit, and make the input test at the connector.

    - If a test indicates a problem, find and correct the cause, then recheck the system.
    - If the input test prove OK, go to step 13.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A17	BLK/RED	Driver's door lock knob unlocked	Check for voltage to ground: There should be less than 1 V.	Faulty driver's door lock kuob switch Poor ground (G401) An open in the wire

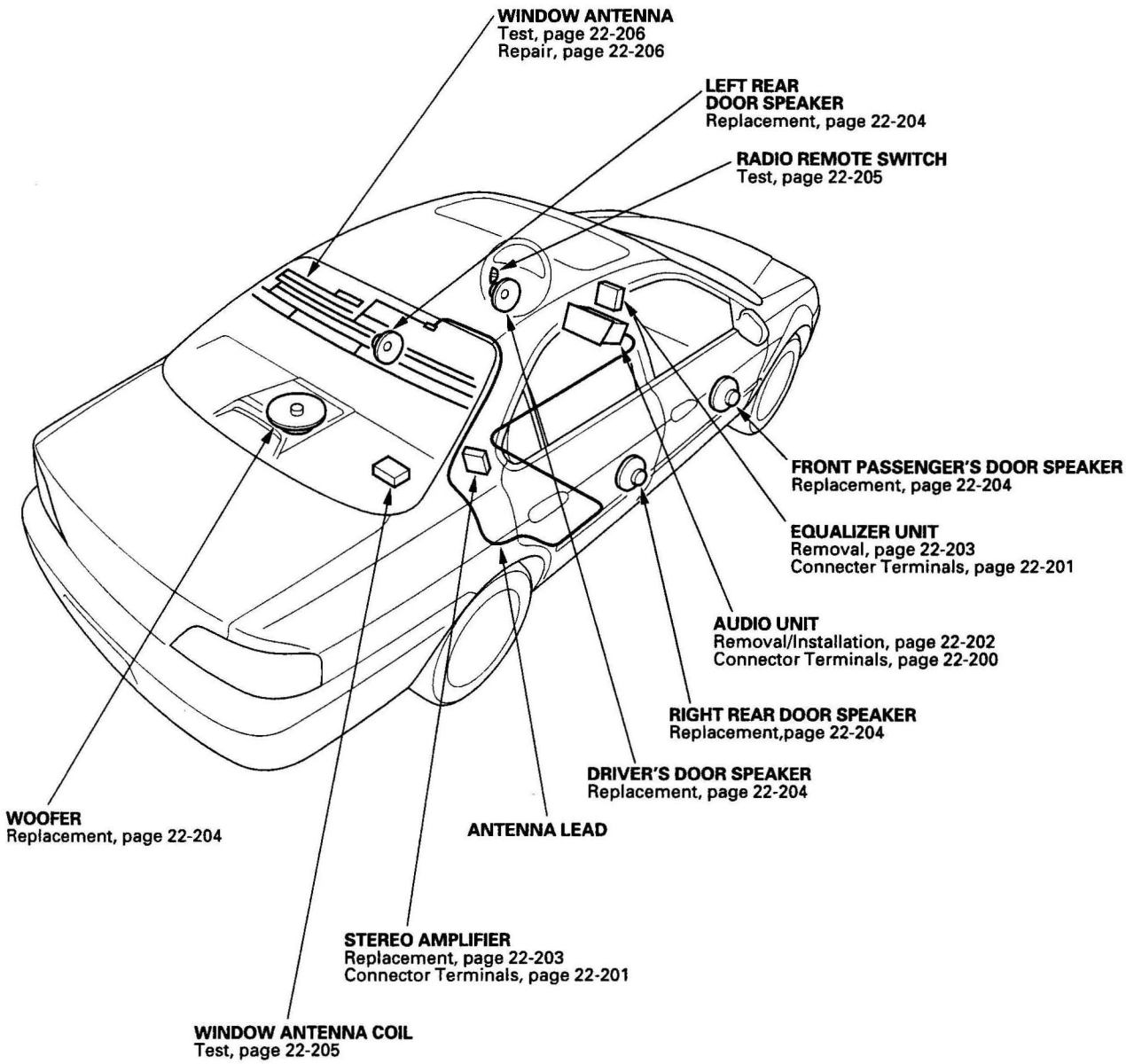
13. If all the input tests prove OK, one of the control units must be faulty. Substitute a known-good control unit for the one that is most likely at fault, then recheck the system. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely unit to be at fault, and recheck. If the system works properly, the original unit is faulty; replace it.

BACK

Protected by AR

Stereo Sound System

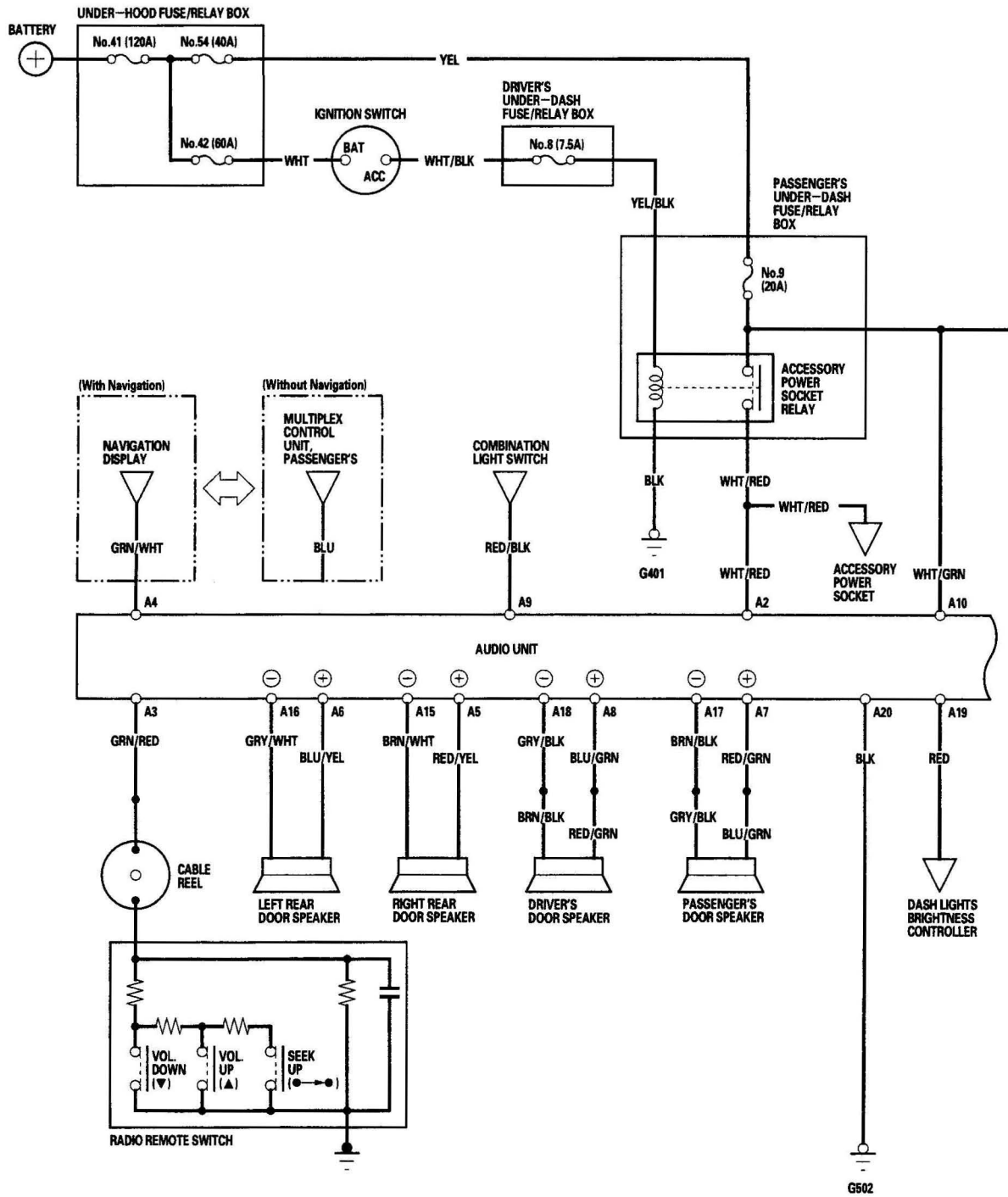
Component Location Index



Protected by AR

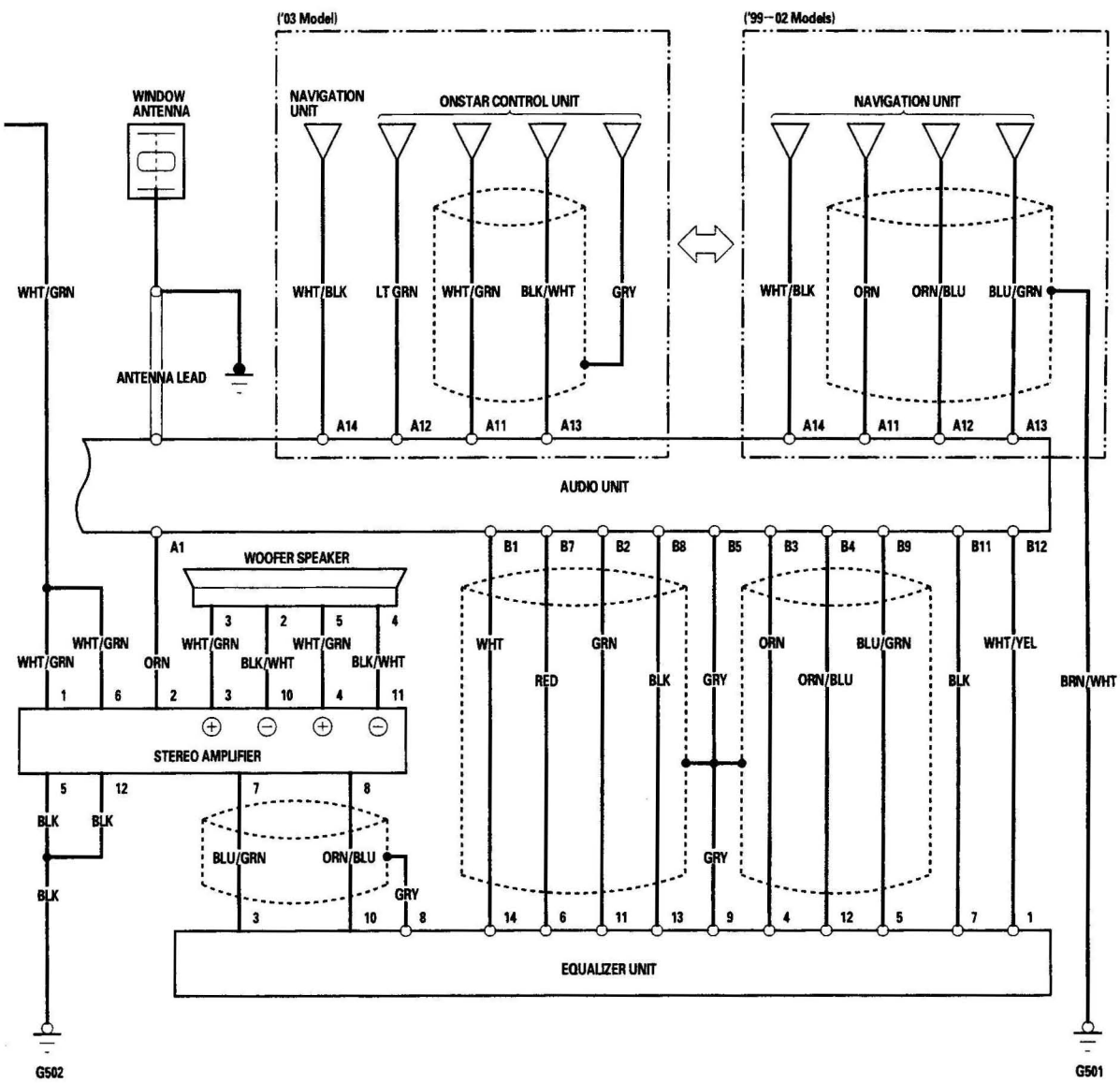
Stereo Sound System

Circuit Diagram



BACK

Protected by AR



Protected by AR

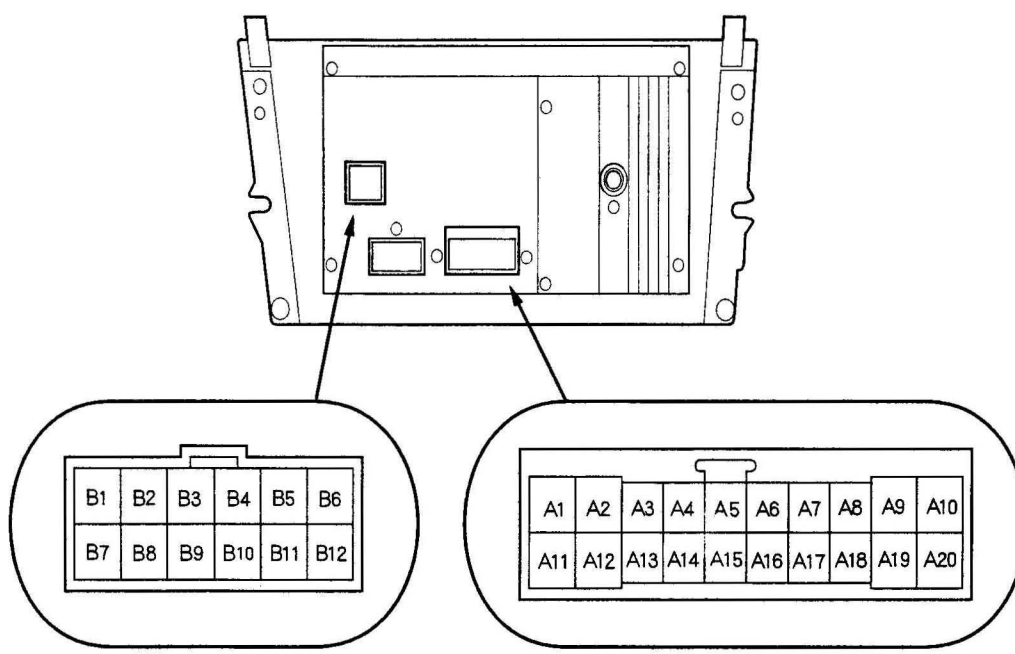
Audio Unit Connector Replacement

When replacing an audio unit connector, match the wires to the cavities as listed in the following table.
Cavities 11, 12, 13 and 14 of the connector A are used for the navigation system or onstar system.

Cavity	Wire	Connects to	Cavity	Wire	Connects to
A1	ORN	Radio switched power	A11	ORN * 3 WHT/GRN * 4	Navigation unit (COM)
A2	WHT/RED	ACC (Main stereo power supply)	A12	ORN/BLU * 3 LT GRN * 4	Navigation unit (R +)
A3	GRN/RED	Radio remote switch	A13	BLU/GRN * 3 BLK/WHT * 4	Navigation unit (L +)
A4	GRN/WHT * 1 BLU * 2	Security input	A14	WHT/BLK	Navigation unit (MUTE)
A5	RED/YEL	Right rear speaker (+)	A15	BRN/WHT	Right rear speaker (−)
A6	BLU/YEL	Left rear speaker (+)	A16	GRY/WHT	Left rear speaker (−)
A7	RED/GRN	Front passenger's door speaker (+)	A17	BRN/BLK	Front passenger's door speaker (−)
A8	BLU/GRN	Driver's door speaker (+)	A18	GRY/BLK	Driver's door speaker (−)
A9	RED/BLK	Lights-on signal	A19	RED	Dash lights brightness controller
A10	WHT/GRN	Constant power	A20	BLK	Ground (G502)

* 1: With Navigation system
* 2: Without Navigation system
* 3: '99-02 Models
* 4: '03 Model

Cavity	Wire	Connects to	Cavity	Wire	Connects to
B1	WHT	Equalizer unit (Left output)	B7	RED	Equalizer unit (Right output)
B2	GRN	Equalizer unit (SUM output)	B8	BLK	Equalizer unit (Common output)
B3	ORN	Equalizer unit (Left input)	B9	BLU/GRN	Equalizer unit (Right input)
B4	ORN/BLU	Equalizer unit (Common input)	B10	———	Not used
B5	GRY	Equalizer unit (Output shielding)	B11	BLK	Equalizer unit (Ground)
B6	———	Not used	B12	WHT/YEL	Equalizer unit (Switched +BAT)



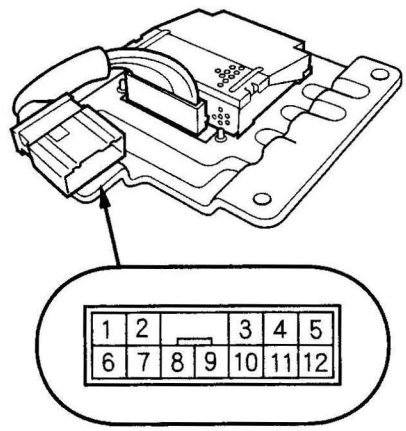
BACK

Protected by AR

Stereo Amplifier Connector and Equalizer Unit Connector Replacement

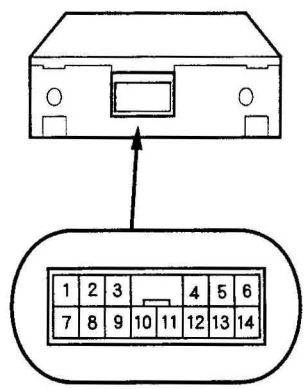
When replacing a stereo amplifier connector, match the wires to the cavities as listed in the following table. Cavity 9 is not used.

Cavity	Wire	Connects to
1	WHT/GRN	Constant power
2	ORN	Radio-switched power
3	WHT/GRN	Woofer speaker (+)
4	WHT/GRN	Woofer speaker (+)
5	BLK	Ground (G581)
6	WHT/GRN	Constant power
7	BLU/GRN	Equalizer unit (BASS +)
8	ORN/BLU	Equalizer unit (BASS −)
9	———	Not used
10	BLK/WHT	Woofer speaker (−)
11	BLK/WHT	Woofer speaker (−)
12	BLK	Ground (G581)



When replacing an equalizer unit connector, match the wires to the cavities as listed in the following table. Cavitiy 2 is not used.

Cavity	Wire	Connects to
1	WHT/YEL	Audio unit (Switched +BAT)
2	———	Not used
3	BLU/GRN	Stereo amplifier (BASS +)
4	ORN	Audio unit (Left output)
5	BLU/GRN	Audio unit (Right output)
6	RED	Audio unit (Right input)
7	BLK	Audio unit (Ground)
8	GRY	Stereo amplifier (BASS shielding)
9	GRY	Audio unit (Output shielding)
10	ORN/BLU	Stereo amplifier (BASS −)
11	GRN	Audio unit (SUM input)
12	ORN/BLU	Audio unit (Common output)
13	BLK	Audio unit (Common input)
14	WHT	Audio unit (Left input)



Protected by AR

Audio Unit Removal/Installation

SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section before performing repairs or service (see page 23-17).

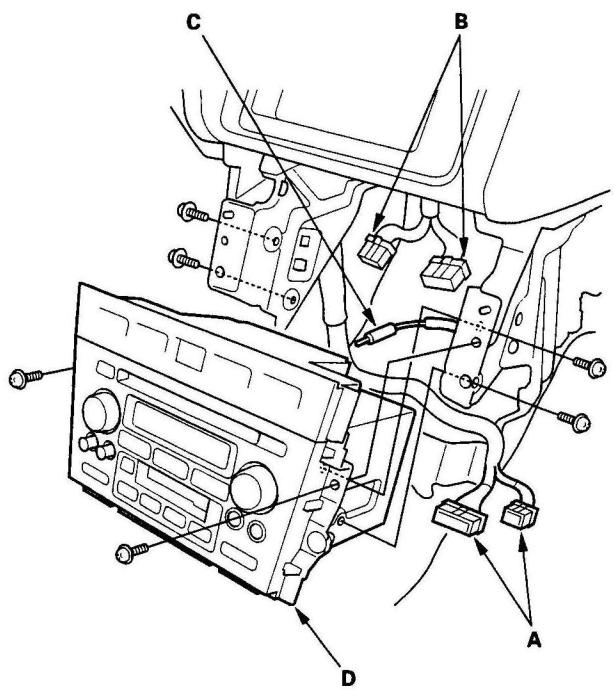
NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the dashboard and related parts.

1. Make sure you have the anti-theft code for the radio and the navigation system, then write down the frequencies for the radio's preset buttons and the navigation system.

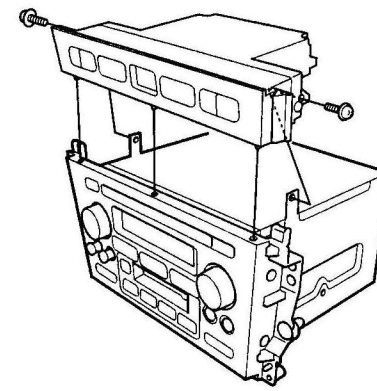
2. Remove the rear console (see page 20-62).

3. Remove the console panel (see page 20-63).

4. Remove the six mounting screws, disconnect the audio unit connectors (A), climate control unit connectors (with Navigation) (B) and the antenna lead (C), then remove the audio unit (D).



5. Remove the climate control unit (with Navigation) or CD console box (without Navigation).



6. Install in the reverse order of removal, and note these items:

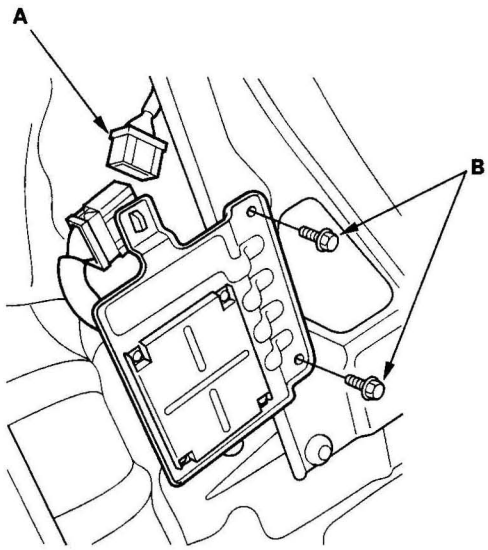
   - Make sure the audio unit connectors are plugged in properly, and the antenna lead is connected properly.
   - Enter the anti-theft code for the radio and the navigation system, then enter the customer's radio station presets.

BACK

Protected by AR

Stereo Amplifier Replacement

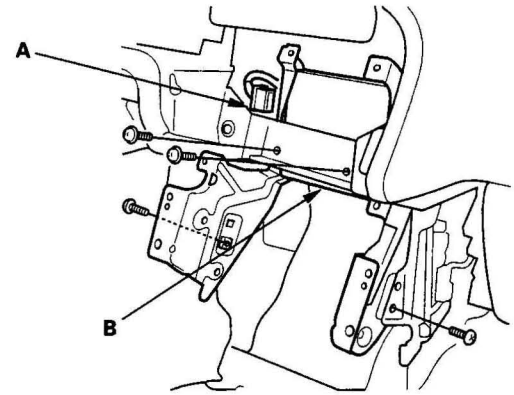
1. Remove the rear seat (see page 20-95).
2. Disconnect the 12P connector (A) from the amplifier.



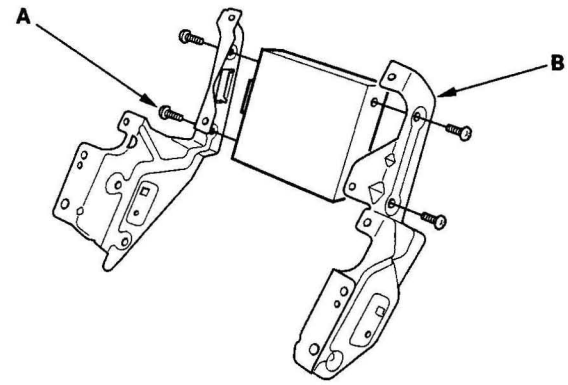
3. Remove the two mounting bolts (B) and the amplifier.
4. Install the amplifier in the reverse order of removal.

Equalizer Unit Replacement

1. Remove the instrument panel (see page 20-65).
2. Remove the rear console and console panel (see page 20-63).
3. Remove the audio unit (see page 22-202).
4. Remove the Navigation display unit on vehicles with Navigation System (see page 22-434), or remove the climate control unit on vehicles without Navigation System (see page 21-60).
5. Disconnect the 14P connector (A) from the equalizer unit (B).



6. Remove the bracket from the dashboard.
7. Remove the mounting screws (A), then remove the equalizer unit from the bracket (B).



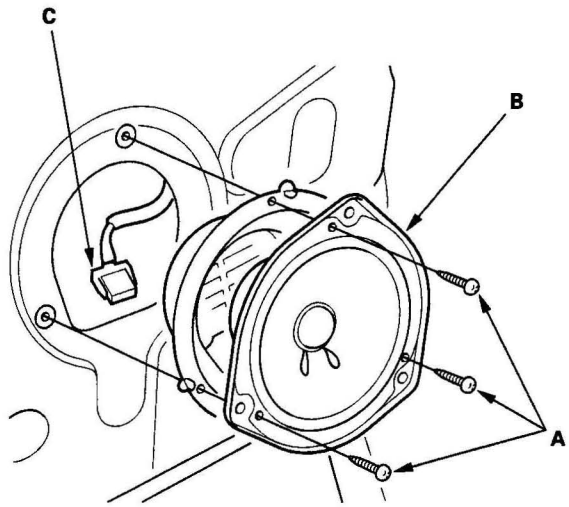
8. Install the equalizer unit in the reverse order of removal.

Protected by AR

Speaker Replacement

Front Speaker:

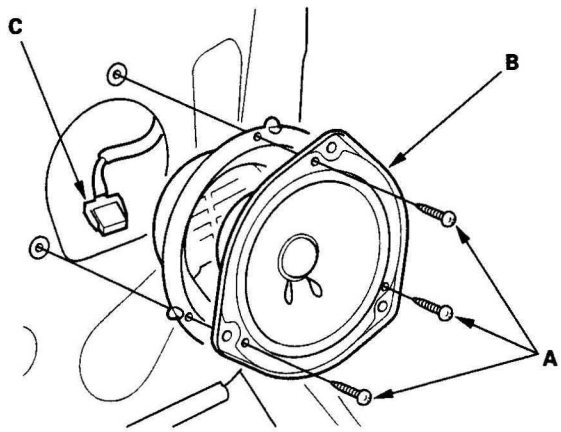
1. Remove the door panel (see page 20-6).
2. Remove the three screws (A) from the speaker (B).



3. Disconnect the 2P connector (C), then remove the speaker.

Rear Speaker:

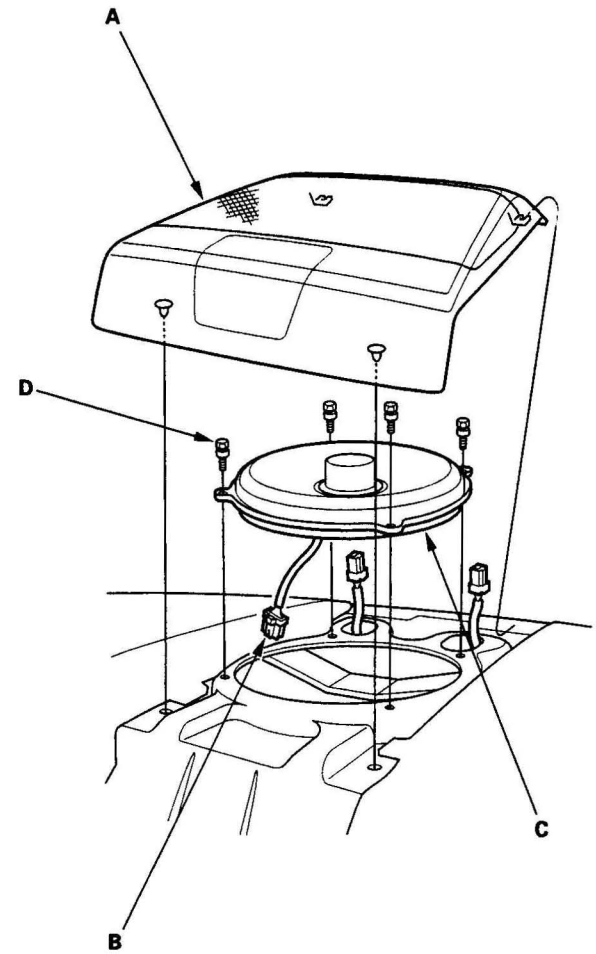
1. Remove the door panel (see page 20-12).
2. Remove the three screws (A) from the speaker (B).



3. Disconnect the 2P connector (C), then remove the speaker.

Woofer:

1. Open the trunk lid.
2. Disconnect the high mount brake light connectors, and remove the bulbs.
3. Remove the woofer cover (A).



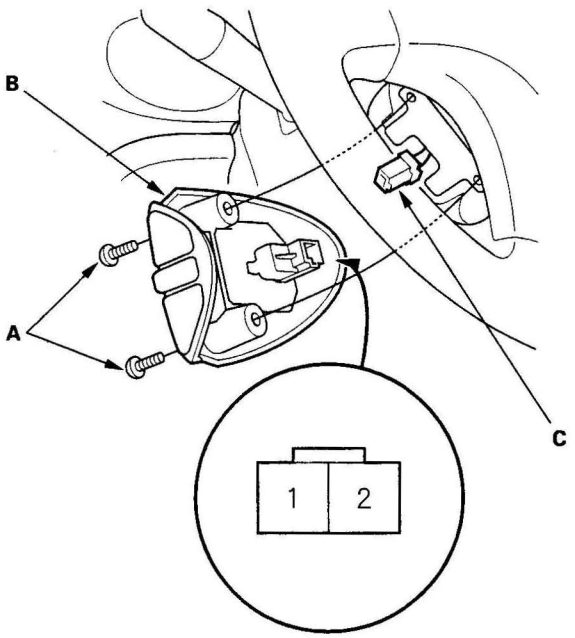
4. Disconnect the 5P connector (B) from the woofer (C), then remove the four screws (D) and the woofer.

BACK

Protected by AR

Radio Remote Switch Test

1. Remove the two screws (A) from the radio remote switch (B).



2. Disconnect the 2P connector (C) from the radio remote switch.

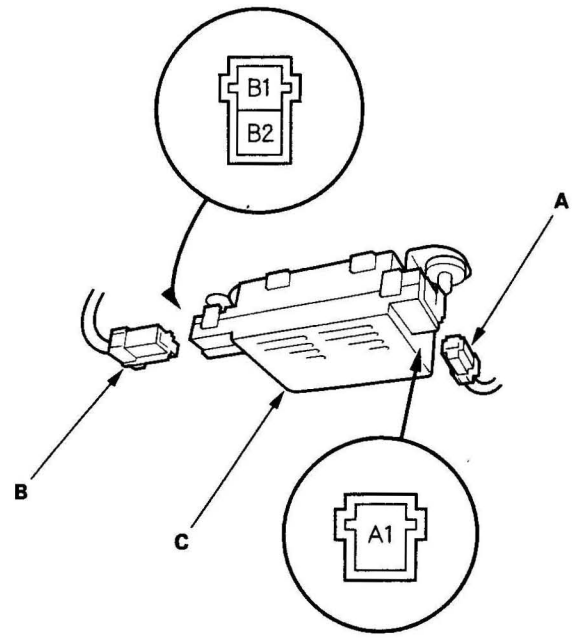
3. Measure resistance between the No. 1 and No. 2 terminals in each switch position according to the table.

Position	Resistance
OFF	About 3.6 kΩ
● ➡ ● (SEEK)	About 990 Ω
▲ (VOL. UP)	About 370 Ω
▼ (VOL. DOWN)	About 100 Ω

4. If the resistance is not as specified, replace the radio remote switch.

Window Antenna Coil Test

1. Disconnect the connectors (A and B) from the window antenna coil (C).



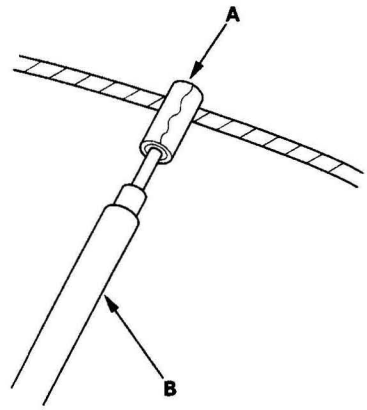
2. Check for continuity between terminal B2 and body ground and between terminals A1 and B1.

3. If there is no continuity, replace the window antenna coil by removing the rear shelf (see page 20-56).

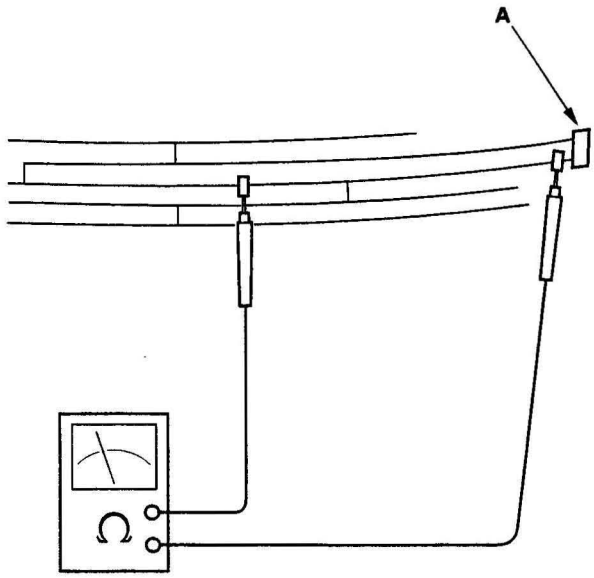
Protected by AR

Window Antenna Test

1. Wrap aluminum foil (A) around the tip of the tester probe (B) as shown.



2. Touch one tester probe to the window antenna terminal (A) here, and move the other tester probe along the antenna wires to check that continuity exists.

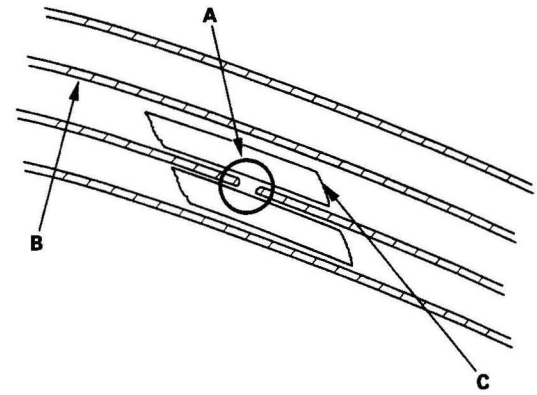


3. If continuity does not exist, repair the window antenna.

Window Antenna Repair

NOTE: To make an effective repair, the broken section must be no longer than 1 inch.

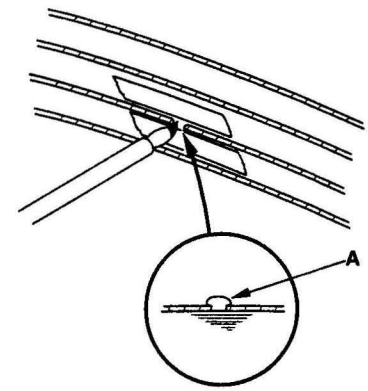
1. Lightly rub the area around the broken section (A) with fine steel wool, then clean it with alcohol.



2. Carefully mask above and below the broken portion of the window antenna wire (B) with cellophane tape (C).

3. Using a small brush, apply a heavy coat of silver conductive paint (A) extending about 1/8" on both sides of the break. Allow 30 minutes to dry.

   NOTE: Thoroughly mix the paint before use.



4. Check for continuity in the repaired wire.

5. Apply a second coat of paint in the same way. Let it dry 3 hours before removing the tape.

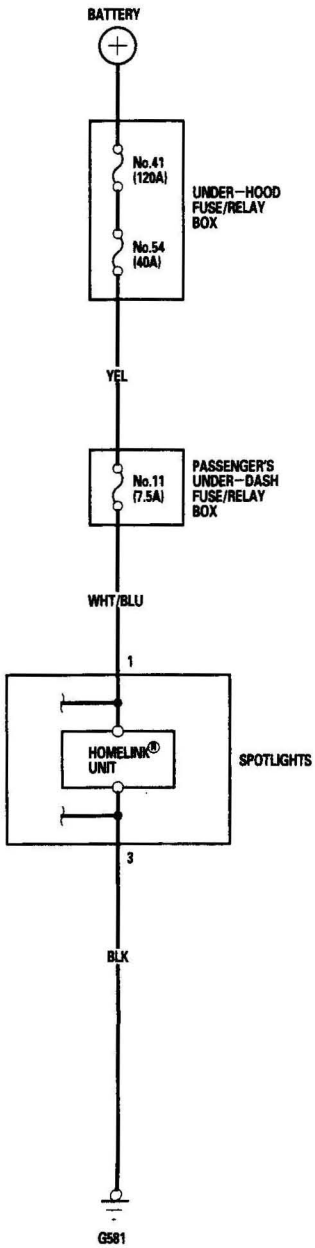
BACK

Protected by AR

Homelink Remote Control System

BODY

Circuit Diagram



Test

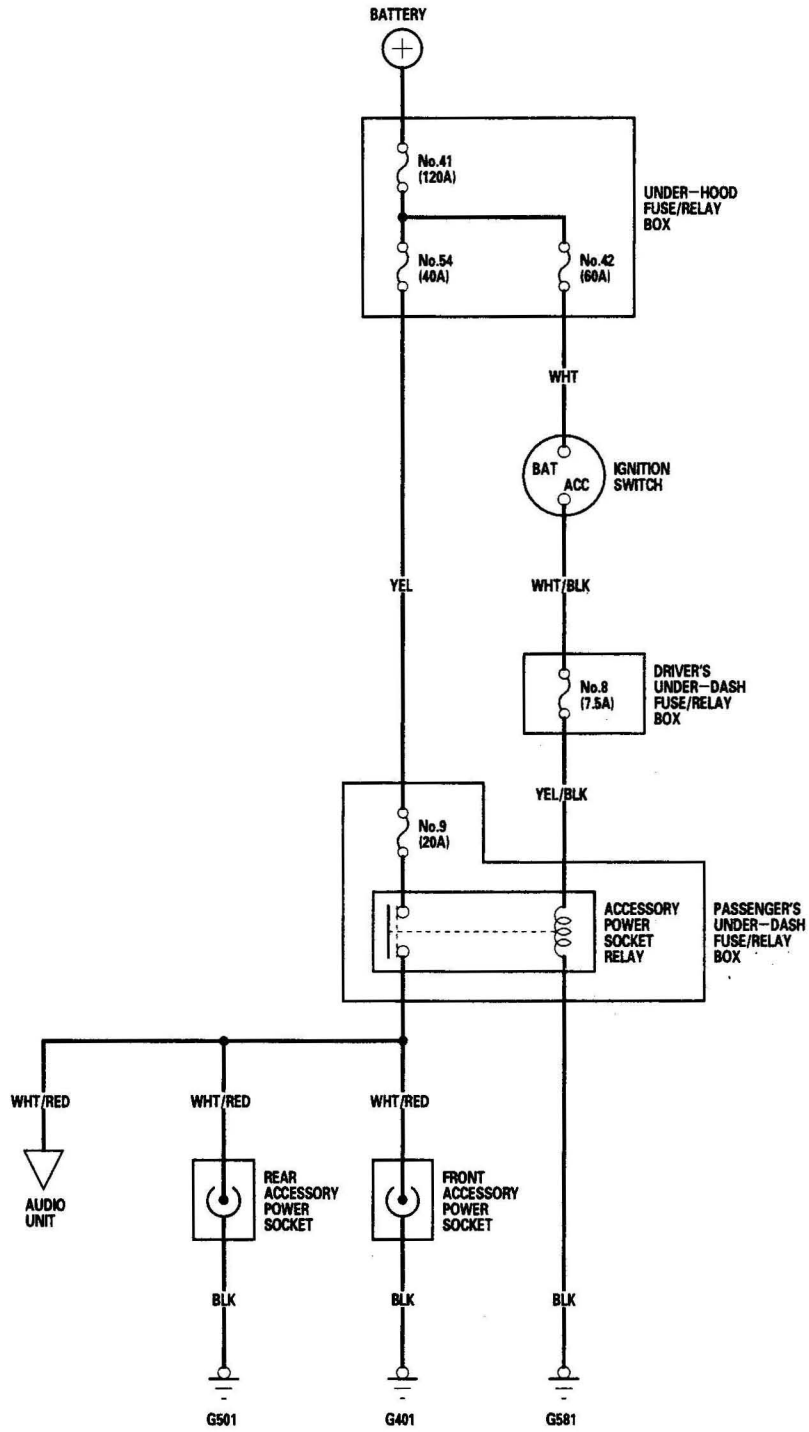
Turn on the spotlight.

- If the spotlight comes on, the Homelink's power and ground circuits are OK. If the Homelink will not open the customer's garage door, check that the Homelink is programmed properly (see the owner's manual), call Homelink at 800-355-3515 or on the internet, go to www.homelink.jci.com
- If the spotlight does not come on, check for these problems:
  - A blown No. 11 (7.5 A) fuse in the passenger's under-dash fuse/relay box.
  - An open in the WHT/BLU wire between the passenger's under-dash fuse/relay box and spotlight.
  - An open in the BLK wire between the spotlight and G581.

Protected by AR

Accessory Power Socket

Circuit Diagram

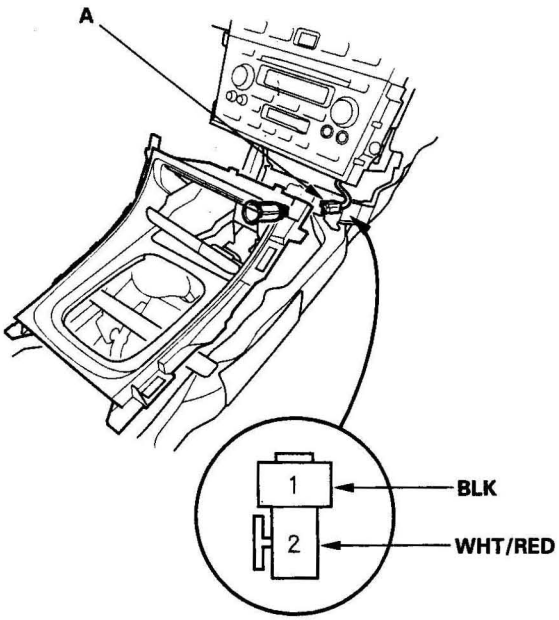


BACK

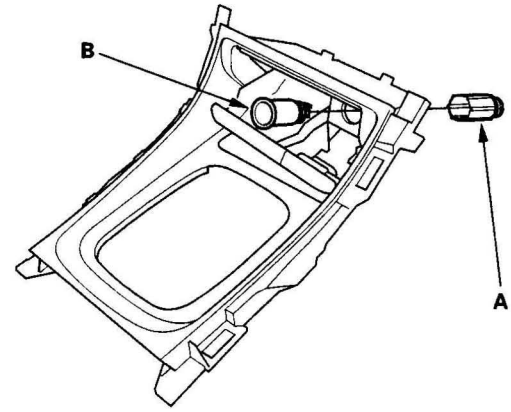
Protected by AR

Front Socket Test/Replacement

1. Remove the rear console and front console trim (see page 20-62).
2. Remove the console panel (see page 20-63).
3. Disconnect the 2P connector (A).



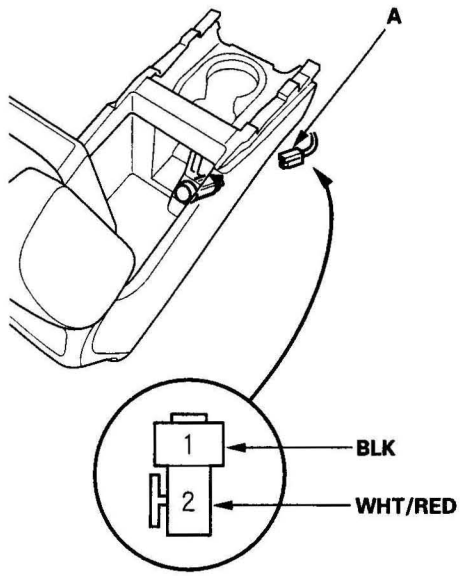
4. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 5.
5. Turn the ignition switch ACC (I), and check for voltage between the No. 1 and No. 2 terminals.
   - There should be battery voltage.
   - If there is no battery voltage, check for:
     - blown No. 8 (7.5 A) fuse in the driver's under-dash fuse/relay box.
     - faulty accessory power socket relay.
     - poor ground (G401, G 581)
     - an open in the wire.
     - blown No. 9 (20 A) in the passenger's under-dash fuse/relay box.
6. Remove the housing (A) and socket (B).



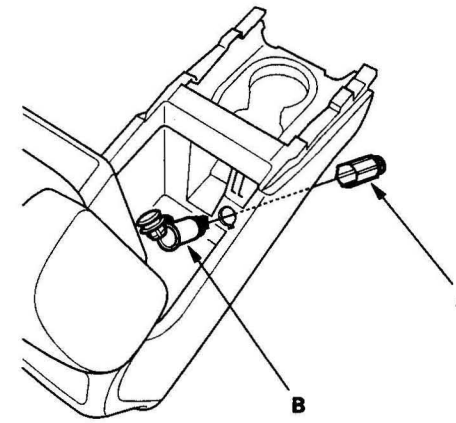
Protected by AR

Rear Socket Test/Replacement

1. Remove the rear console (see page 20-62).
2. Disconnect the 2P connector (A).



3. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.
4. Turn the ignition switch ACC (I), and check for voltage between the No.1 and No.2 terminals.
   - There should be battery voltage.
   - If there is no battery voltage.
     - blown No.8 (7.5 A) fuse in the driver's under-dash fuse/relay box.
     - faulty accessory power socket relay.
     - poor ground (G501, G581).
     - an open in the wire.
     - blown No.9 (20 A) in the passenger's under-dash fuse/relay box.
5. Remove the housing (A) and socket (B).

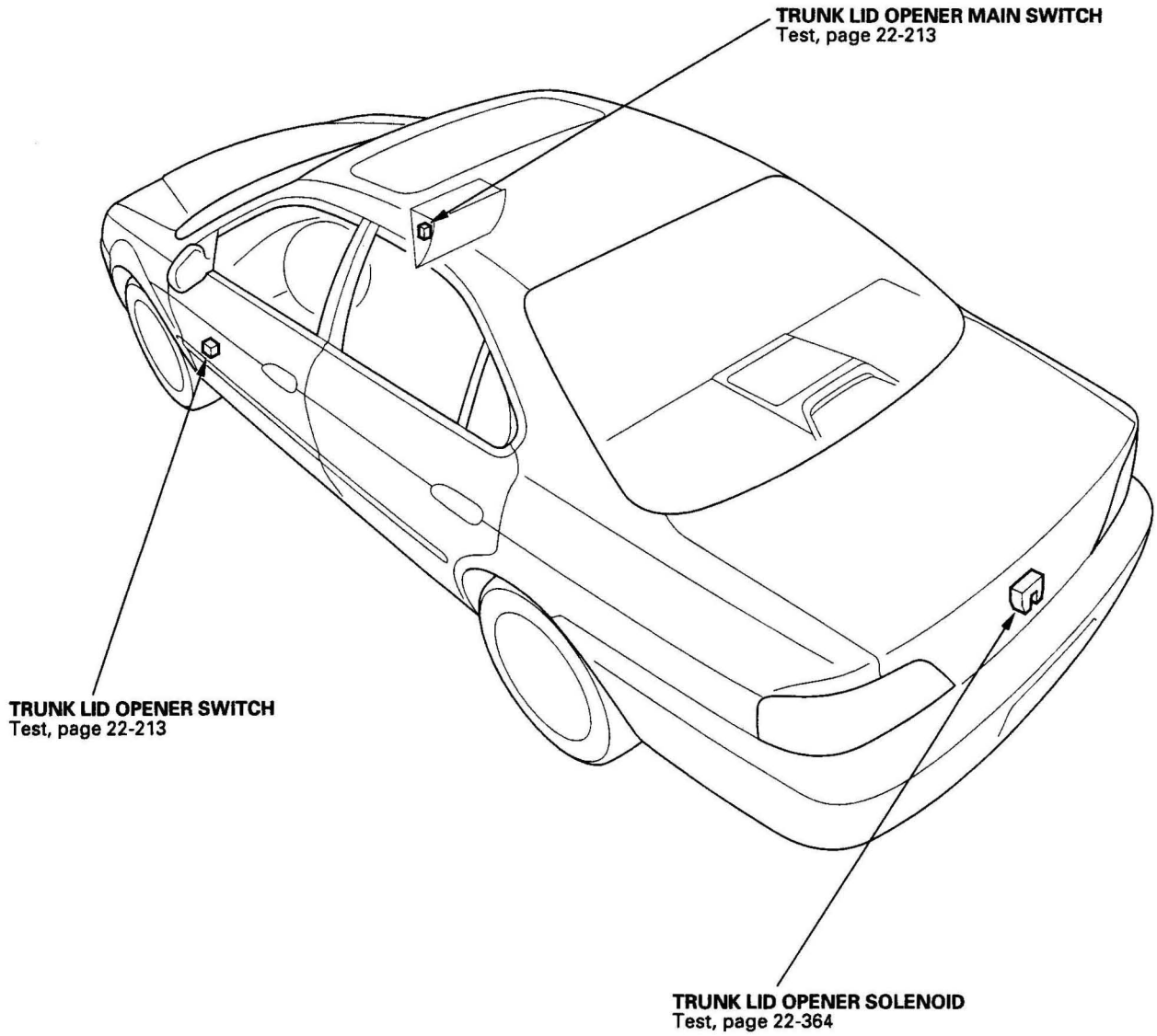


BACK

Protected by AR

Trunk Lid Opener

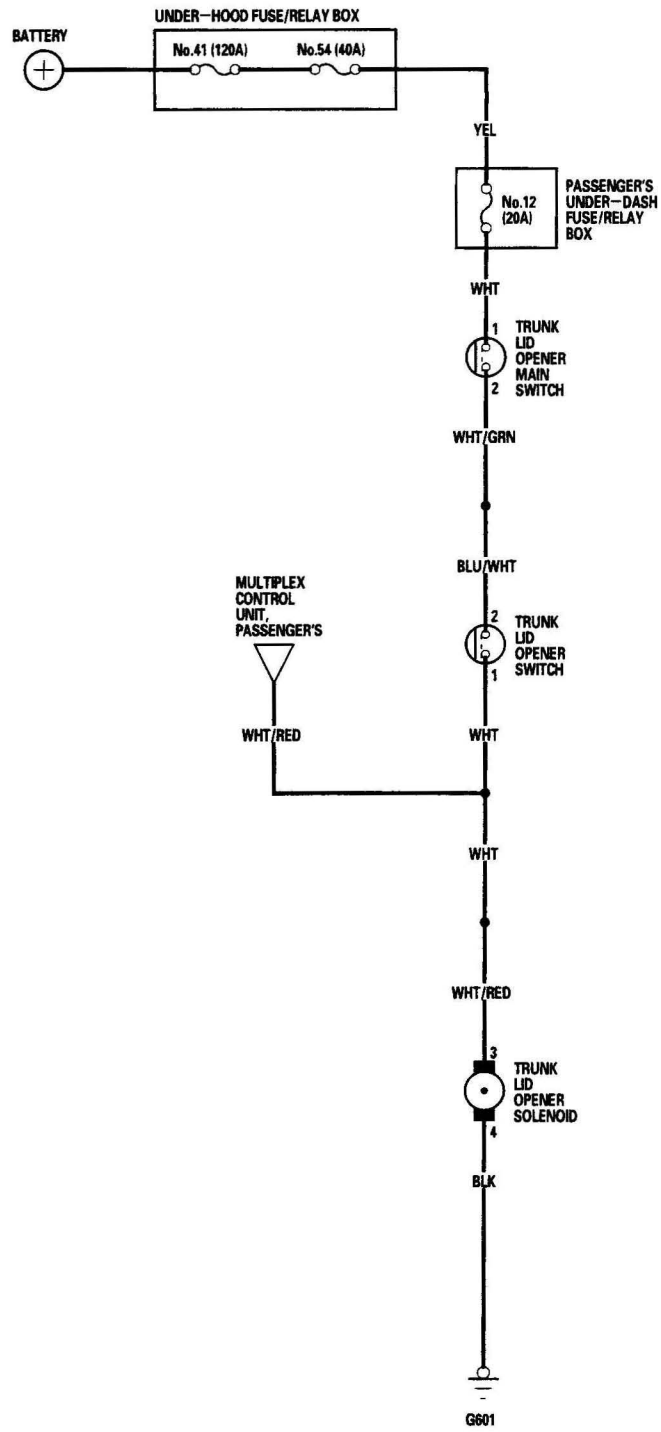
Component Location Index



Protected by AR

Trunk Lid Opener

Circuit Diagram

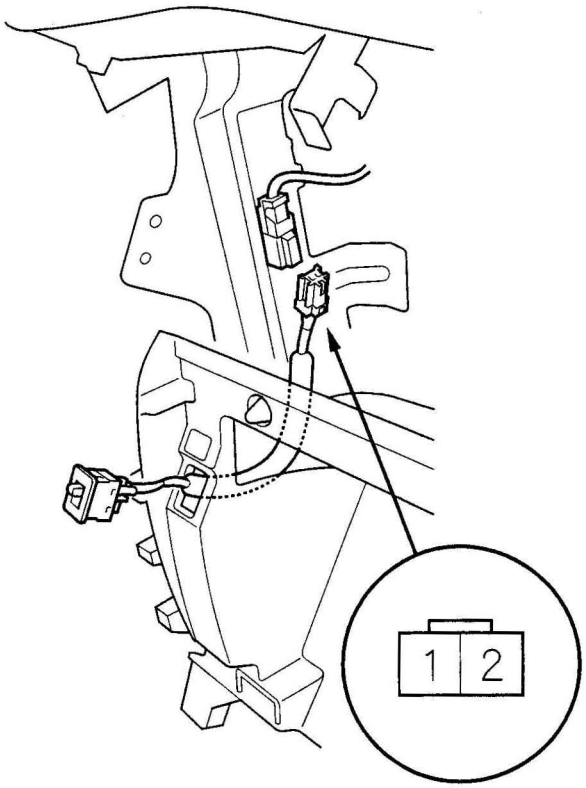


BACK

Protected by AR

Main Switch Test

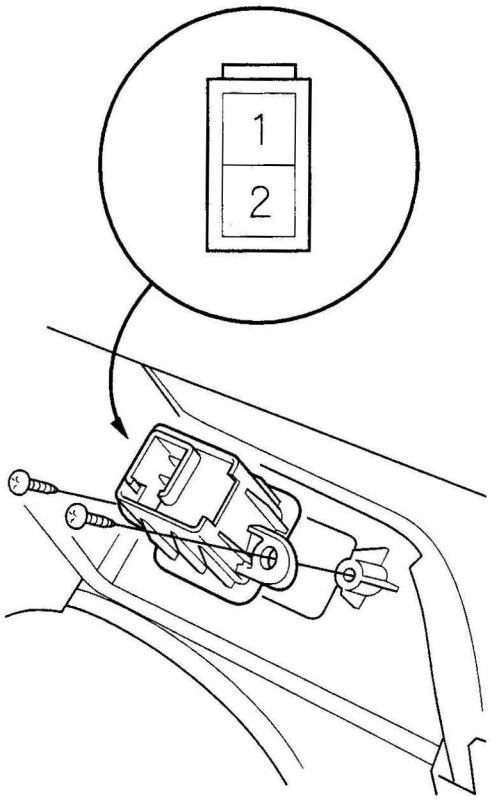
1. Remove the glove box (see page 20-66).
2. Remove the front passenger's console cover (see page 20-63).
3. Disconnect the 2P connector from the main switch.



4. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity with the switch ON.
   - There should be no continuity with the switch OFF.
5. If the continuity is not as specified, replace the main switch.

Switch Test

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 2P connector from the switch.



3. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity when the switch is pushed.
   - There should be no continuity when the switch is released.
4. If the continuity is not as specified, replace the switch.

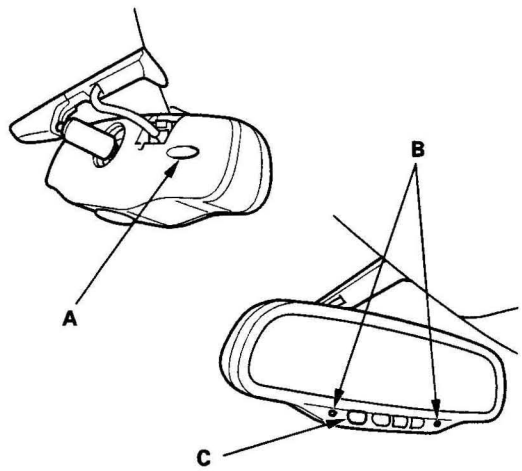
Protected by AR

Automatic Dimming Inside Mirror

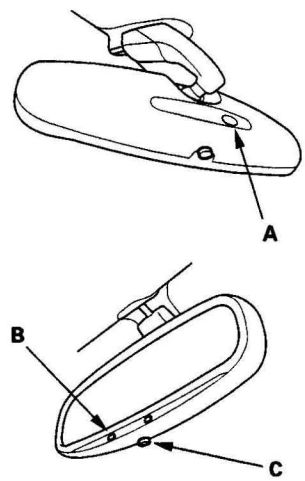
Description

The automatic dimming inside mirror has a front-facing lux level sensor (A), a rear-facing lux level sensor (B), and a control unit. The control unit receives signals from each sensor. Based on the difference between the two lux levels (the light outside the vehicle and the light from the headlights of the other vehicle, etc.), the control unit controls the electro-chromic gel to reduce the glare. This dimming function is canceled when the transmission is in reverse, or when the automatic dimming switch (C) is turned OFF.

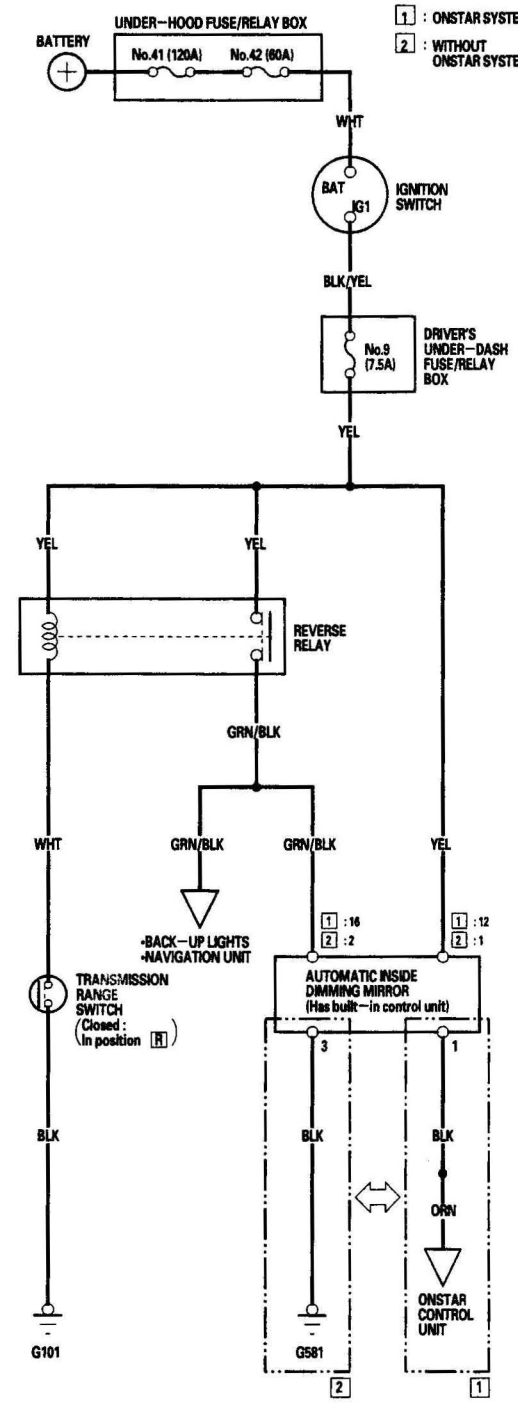
ONSTAR SYSTEM



WITHOUT ONSTAR SYSTEM



Circuit Diagram



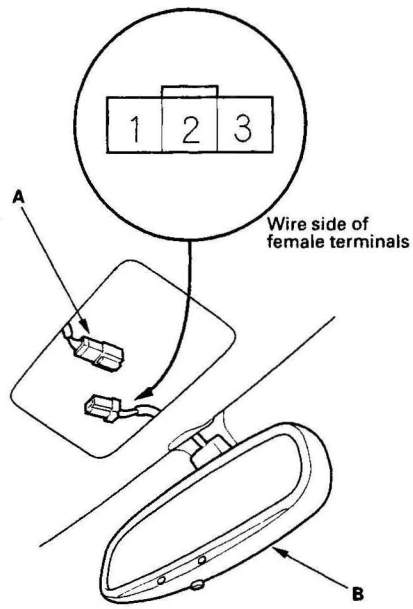
BACK

Protected by AR

Test/Replacement

Without OnStar System:

1. Remove the front ceiling light (see page 22-181).
2. Disconnect the 3P connector (A) from the automatic inside dimming mirror (B).

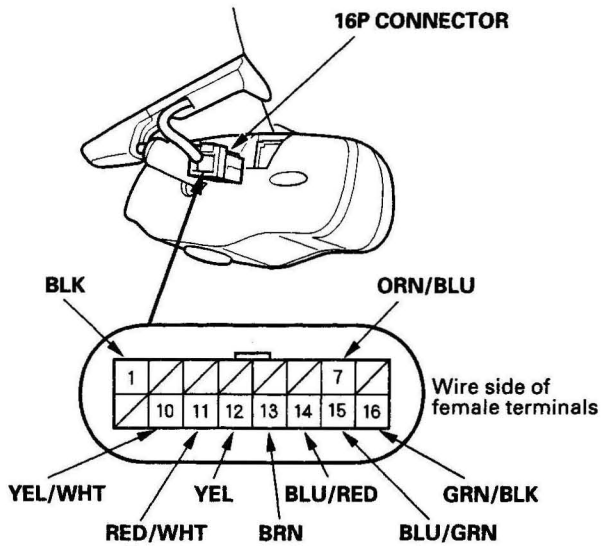


3. Check for continuity between No. 3 terminal and body ground.
   - If there is continuity, go to step 4.
   - If there is no continuity, check for:
     - an open in the wire.
     - poor ground (G581).
4. Check for voltage between No.1 terminal and body ground with the ignition switch ON (II).
   - If there is battery voltage, go to step 5.
   - If there is no voltage, check for:
     - blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box.
     - an open in the wire.
5. Check for voltage between No. 2 terminal and body ground with the ignition switch ON (II) and Transmission range switch in R.
   - If there is battery voltage, replace the mirror assembly.
   - If there in no voltage, check for:
     - an open in the wire.
     - faulty reverse relay.
     - faulty Transmission range switch.

OnStar System:

NOTE: Before testing, check the NO. 13 (7.5A) fuse. NO. 7, 10, 11, 13, 14, and 15 terminals are OnStar switches microphone power, ground and signal lines.

1. Disconnect the 16P connector from the mirror.



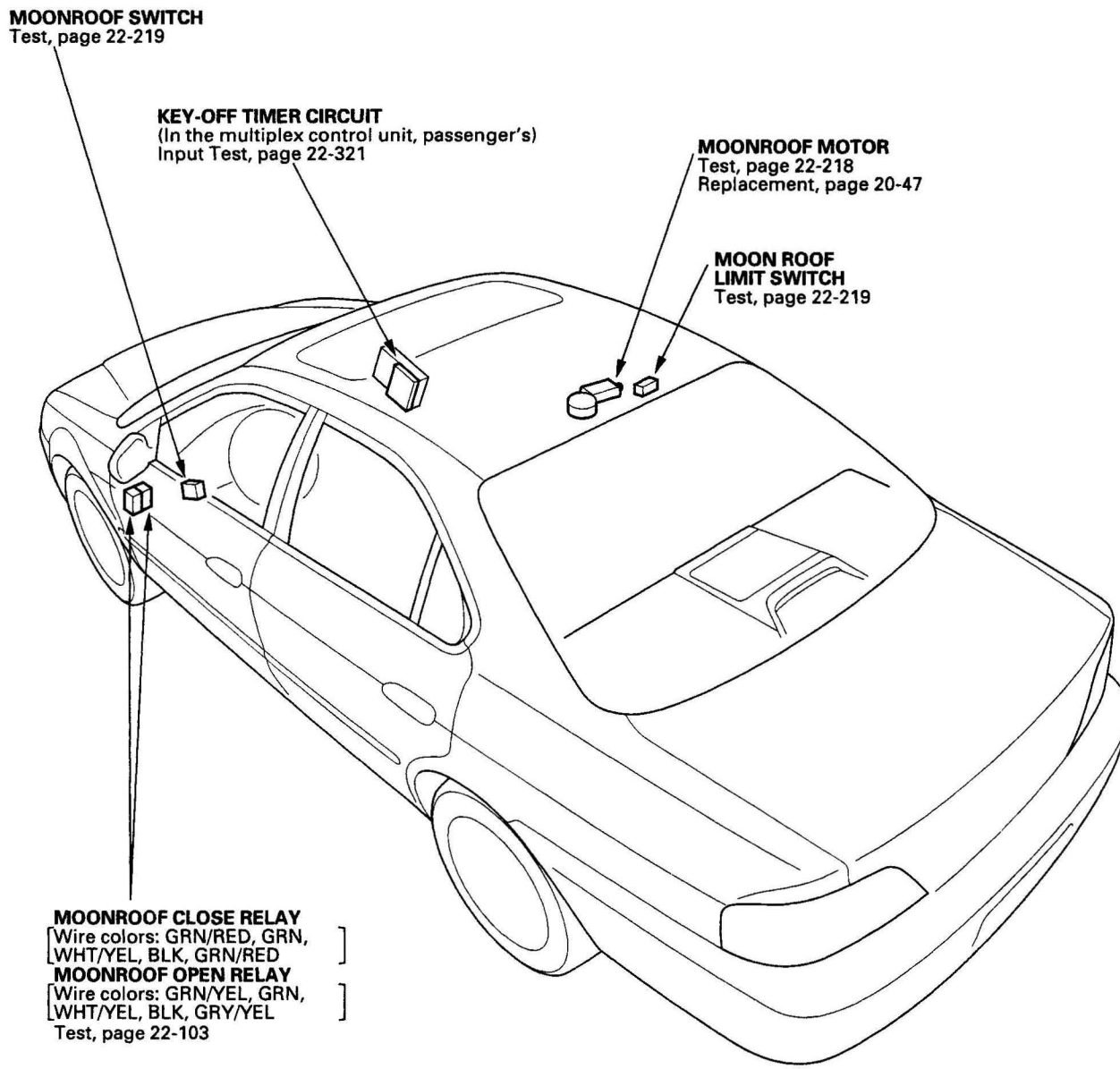
2. Check for voltage between the NO. 12 terminal and body ground with the ignition switch ON (II).
   - If there is battery voltage, go to step 3.
   - If there is no voltage, check for:
     - an open in the wire.
3. Check for voltage berween the NO. 16 terminal and body ground with the ignition switch ON (II) and A/T gear position in R.
   - If there is battery voltage, replace the mirror by removing torx screw.
   - If there is no voltage, check for:
     - an open in the wire, or
     - faulty reverse relay, or
     - faulty transmission range switch.

BACK

Protected by AR

Moonroof

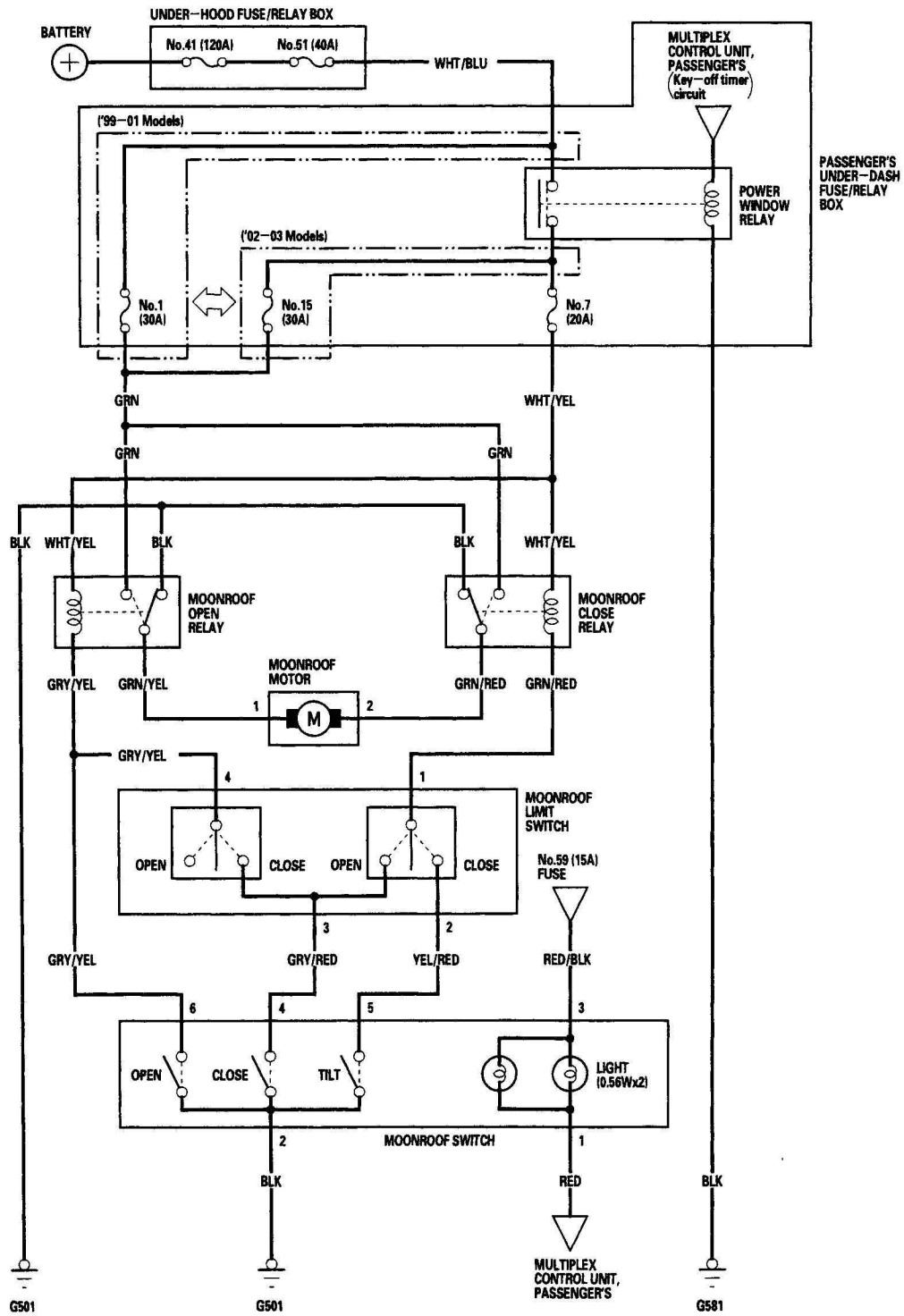
Component Location Index



BACK

Protected by AR

Circuit Diagram



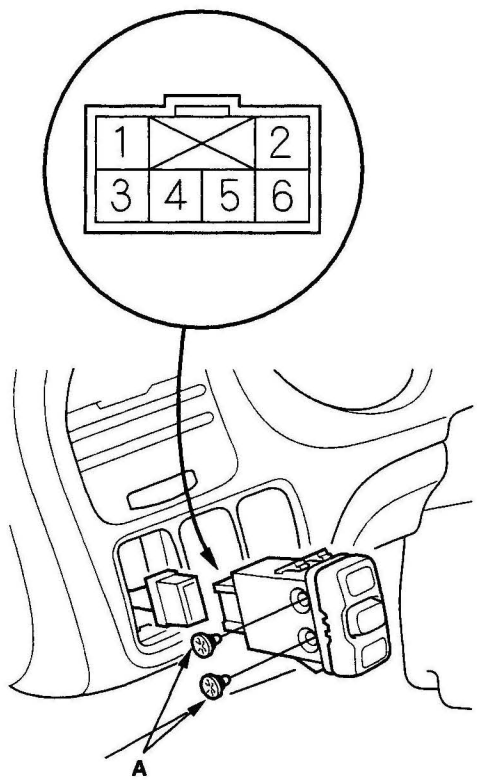
BACK

Protected by AR

Switch Test

NOTE: The moonroof can still be operated for about 10 minutes after the ignition switch is turned from the "II" to the "I" or "O" positions, as long as none of the doors have been opened. This provides a convenience to parked occupants while offering a degree of security against unwanted or accidental moonroof operation.

1. Remove the driver's dashboard lower cover (see page 20-65).
2. Carefully pry out the switch from the dashboard, and disconnect its connector.



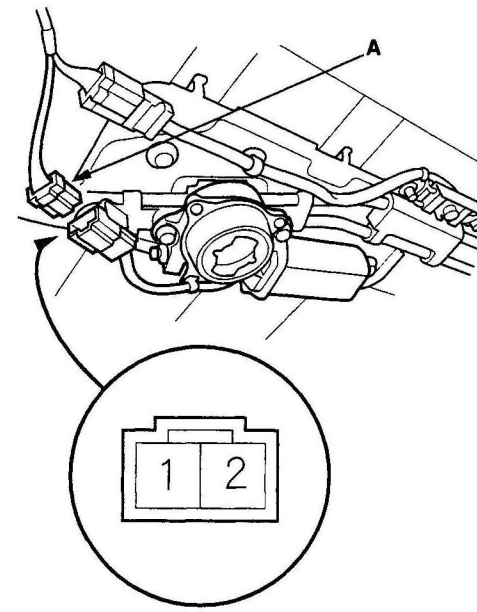
3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1		3	2	4	5	6
CLOSE				○	○		
TILT	○		○	○		○	
OPEN				○			○

4. If the continuity is not as specified, replace the bulbs (A) or the switch.

Motor Test

1. Remove the headliner (see page 20-59).
2. Disconnect the 2P connector (A) from the moonroof motor.



3. Check the motor by connecting power and ground according to the table.

Terminal / Position	1	2
OPEN	⊕	⊖
CLOSE	⊖	⊕

4. If the motor does not run, replace it.

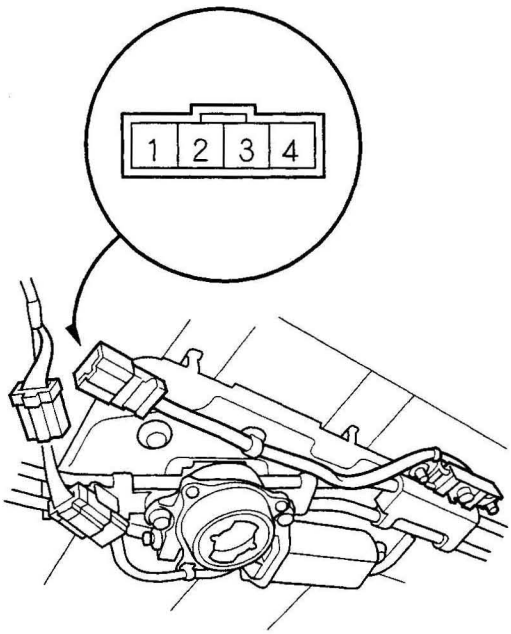
   NOTE: See closing force check (see page 20-53) for motor clutch test.

BACK

Protected by AR

Limit Switch Test

1. Remove the headliner (see page 20-59).
2. Disconnect the 4P connector from the moonroof limit switch.



3. Check for continuity between the terminals in each switch position according to the table.

   NOTE: Turn the motor by hand with the wrench.

Terminal / Position	1	2	3	4
TILT	○——	——○	○——	——○
OPEN	○——		——○	
CLOSE	○——	——○	○——	——○

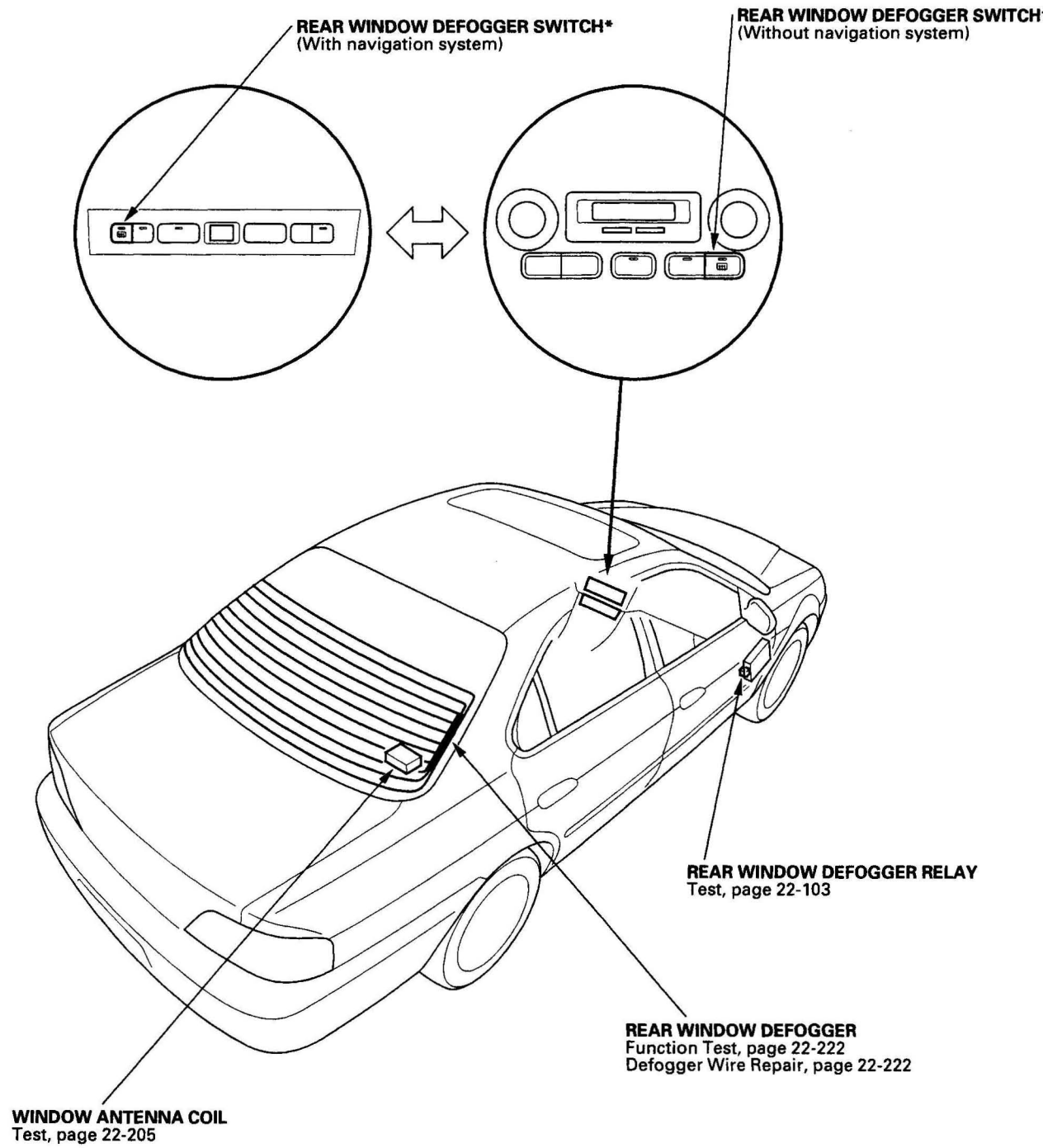
4. If there is no continuity, replace the motor.

Protected by AR

Rear Window Defogger

Component Location Index

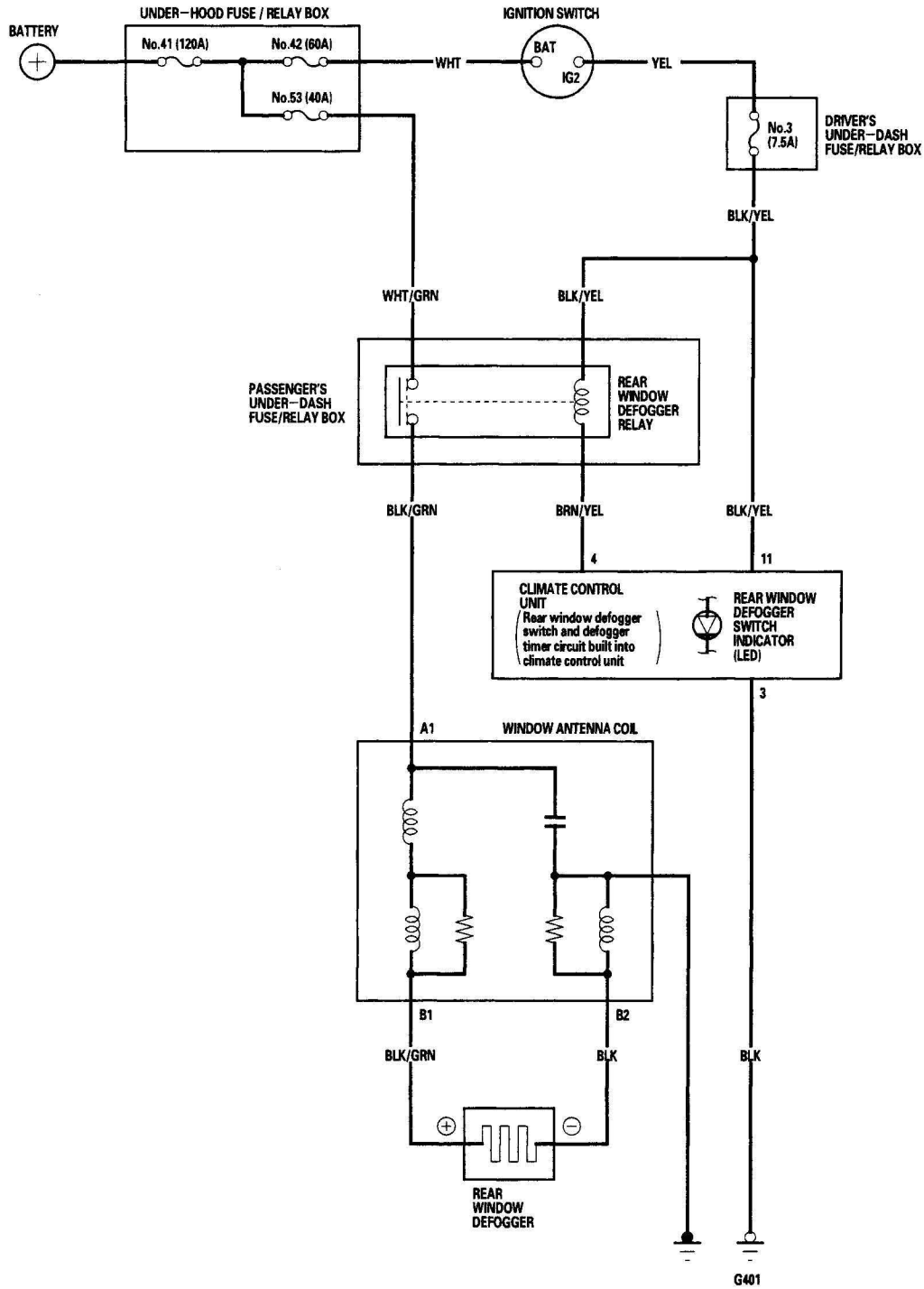
***: Rear window defogger switch is built into the climate control unit.**



BACK

Protected by AR

Circuit Diagram



BACK

Protected by AR

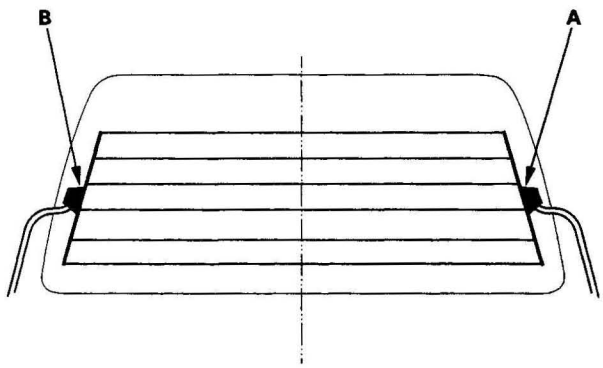
Rear Window Defogger

Function Test

NOTE: Be careful not to scratch or damage the defogger wires with the tester probe.

1. Check for voltage between the positive terminal (A) and body ground with the ignition switch and defogger switch ON.
   There should be battery voltage.

   - If there is no voltage, check for:
     - a faulty defogger relay.
     - faulty window antenna coil.
     - an open in the BLK/GRN wire.
   - If there is battery voltage, go to step 2.



2. Check for continuity between the negative terminal (B) and body ground.
   If there is no continuity, check for an open in the defogger ground wire.

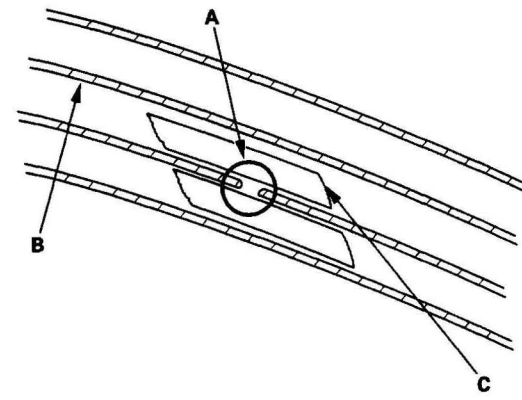
3. Touch the voltmeter positive probe to the halfway point of each defogger wire, and the negative probe to the negative terminal.
   There should be about 6 V with the ignition switch and the defogger switch ON.

   - If the voltage is as specified, the defogger wire is OK.
   - If the voltage is not as specified, repair the defogger wire.
     - If it is more than 6 V, there is a break in the negative half of the wire.
     - If it is less than 6 V, there is a break in the positive half of the wire.

Defogger Wire Repair

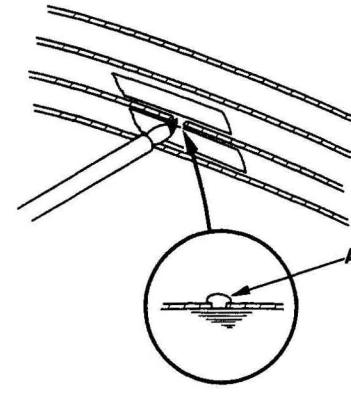
NOTE: To make an effective repair, the broken section must be no longer than 1 inch.

1. Lightly rub the area around the broken section (A) with fine steel wool, then clean it with alcohol.



2. Carefully mask above and below the broken portion of the defogger wire (B) with cellophane tape (C).

3. Using a small brush, apply a heavy coat of silver conductive paint extending about 1/8″ on both sides of the break. Allow 25 minutes to dry. Thoroughly mix the paint before use.



4. Check for continuity in the repaired wire.

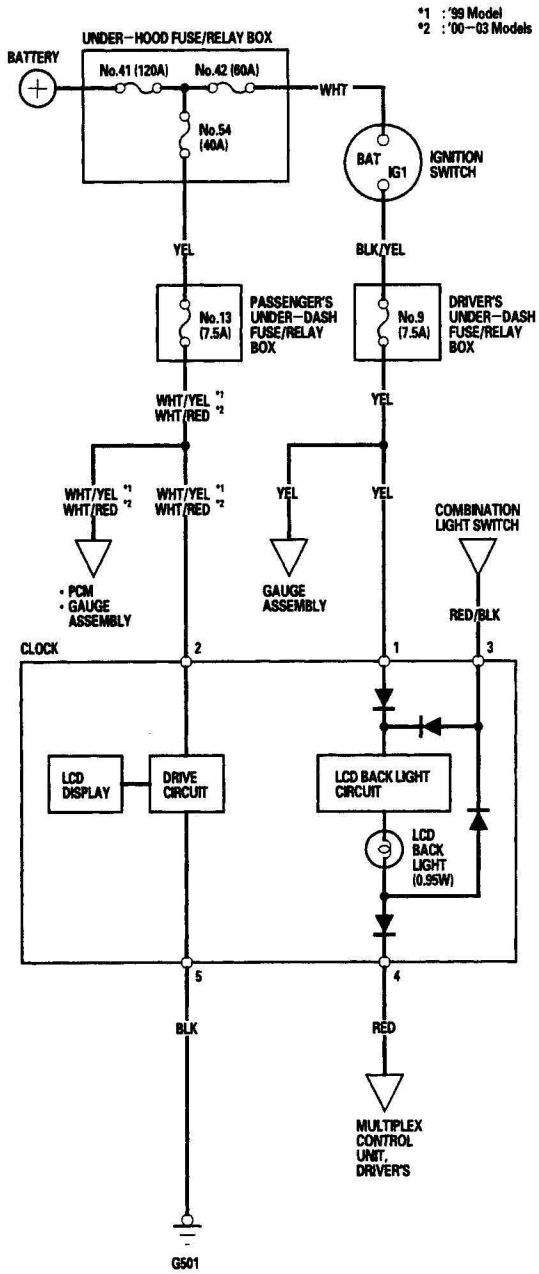
5. Apply a second coat of paint in the same way. Let it dry 3 hours before removing the tape.

BACK

Protected by AR

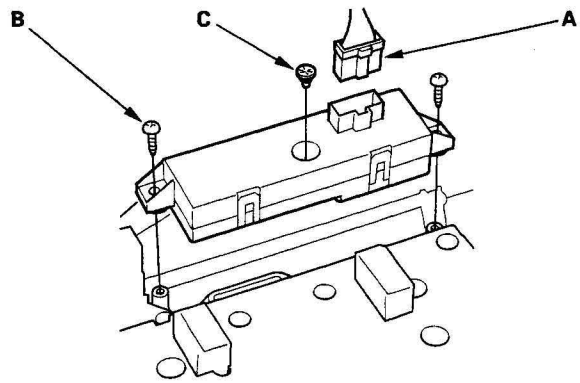
Clock

Circuit Diagram



Replacement

1. Remove the instrument panel (see page 20-65).
2. Disconnect the 5P connector (A) from the clock.



3. Remove the two mounting screws (B) from the clock.
4. Remove the clock from the instrument panel.

Terminals

Cavity	Wire	Connect to
1	YEL	IG1 (Main clock power supply)
2	WHT/YEL*1 WHT/RED*2	Constant power
3	RED/BLK	Lights-on signal
4	RED	Multiplex control unit, driver's
5	BLK	Ground

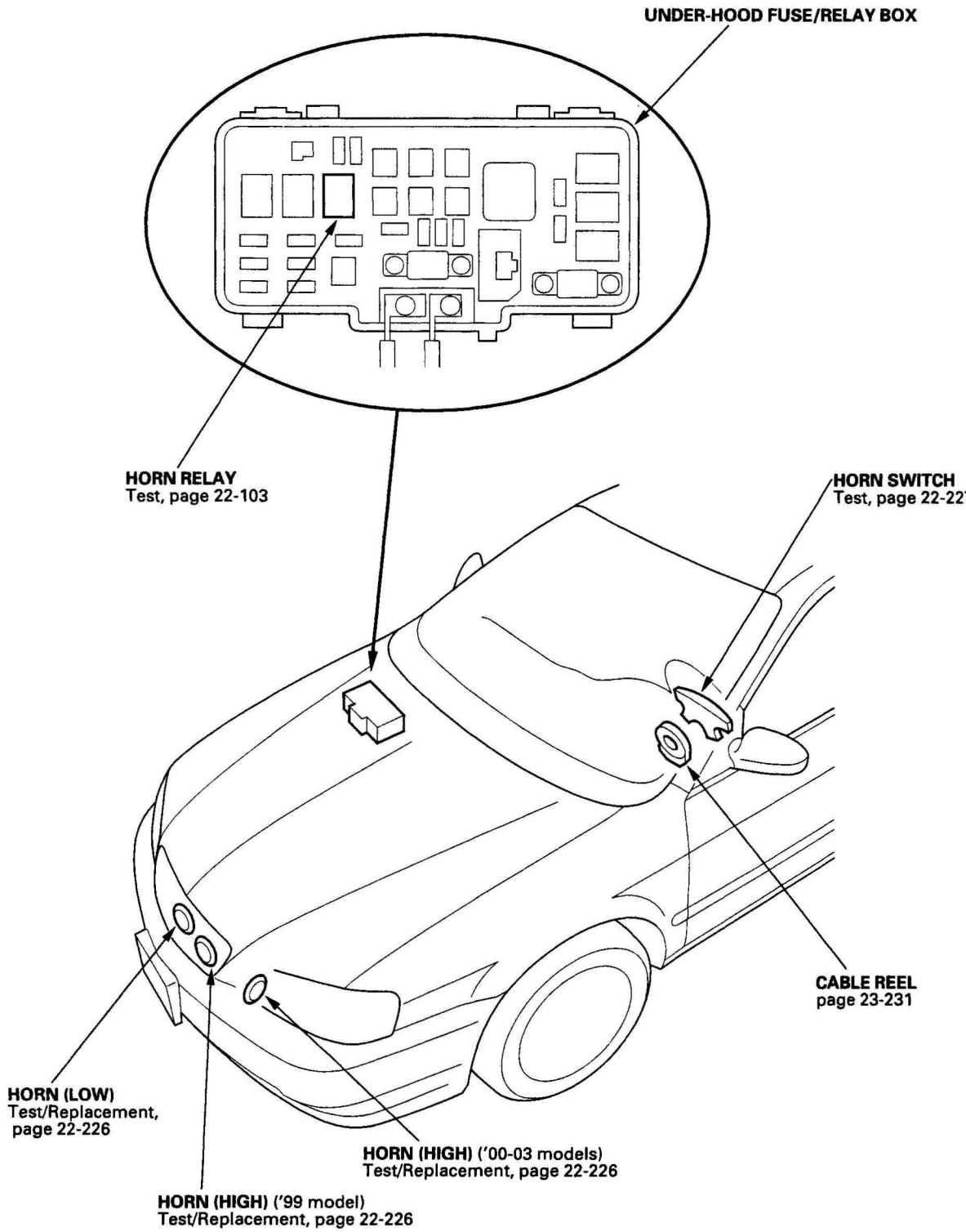
* 1: '99 Model
* 2: '00-03 Models

5. If necessary, replace the bulb (C).

BACK

Protected by AR

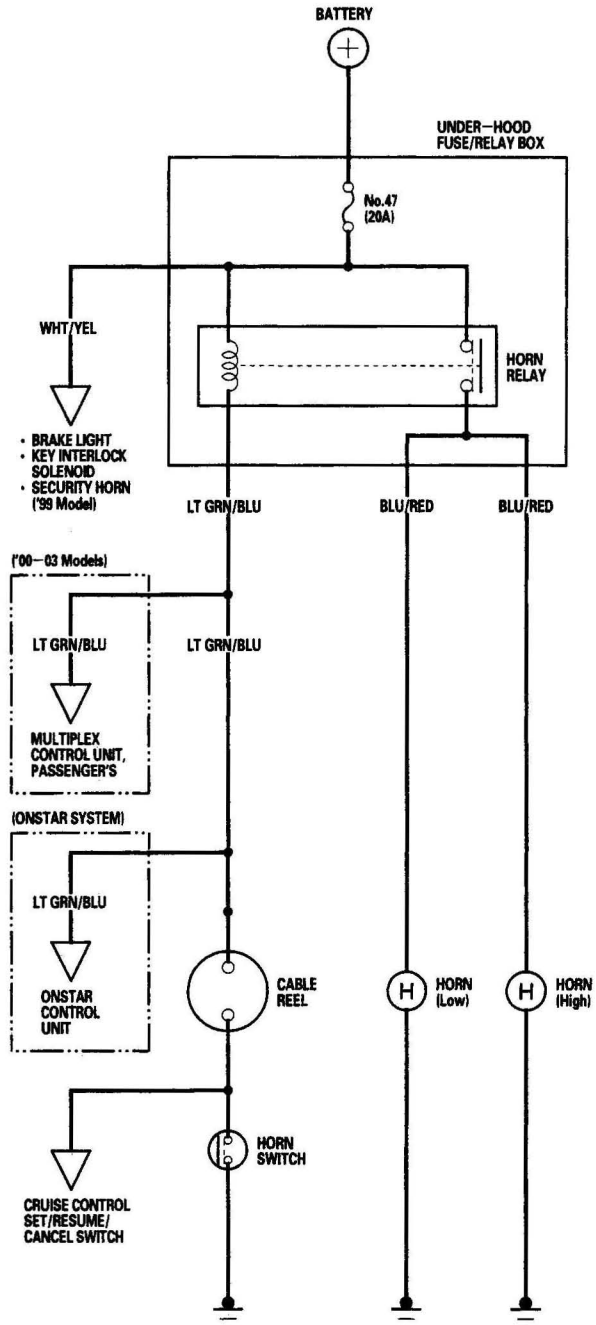
Component Location Index



BACK

Protected by AR

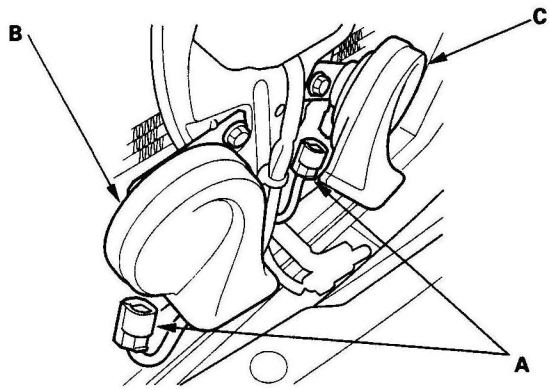
Circuit Diagram

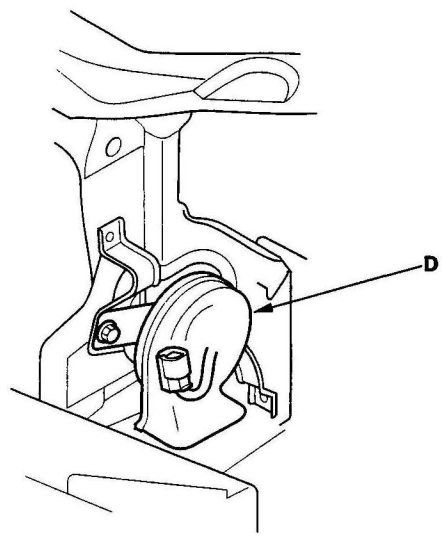


Protected by AR

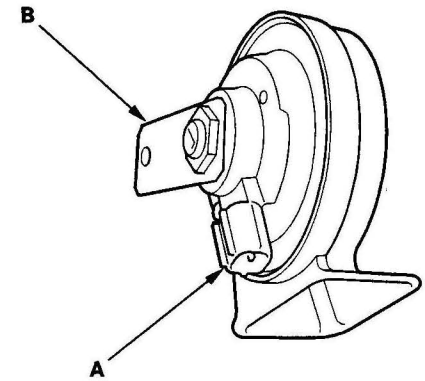
Horn Test/Replacement

1. Open the hood.
2. Remove the front bulkhead cover (see page 20-135).
3. Remove the front bumper (see page 20-101). (High horn for '00-03 models)
4. Disconnect the 1P connector (A), and remove the low horn (B) and high horn (C) ('99 model) or (D) ('00-03 models).





5. Test the horn by connecting battery power to the terminal (A) and grounding the bracket (B). The horn should sound.



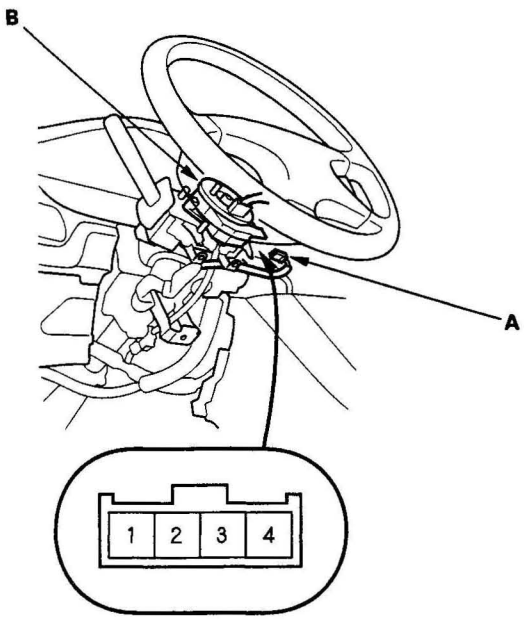
6. If it fails to sound, replace it.

BACK

Protected by AR

Horn Switch Test

1. Remove the dashboard lower cover (see page 20-65).
2. Remove the steering column upper and lower covers (see page 17-27).
3. Disconnect the dashboard wire harness B 4P connector (A) from the cable reel (B).



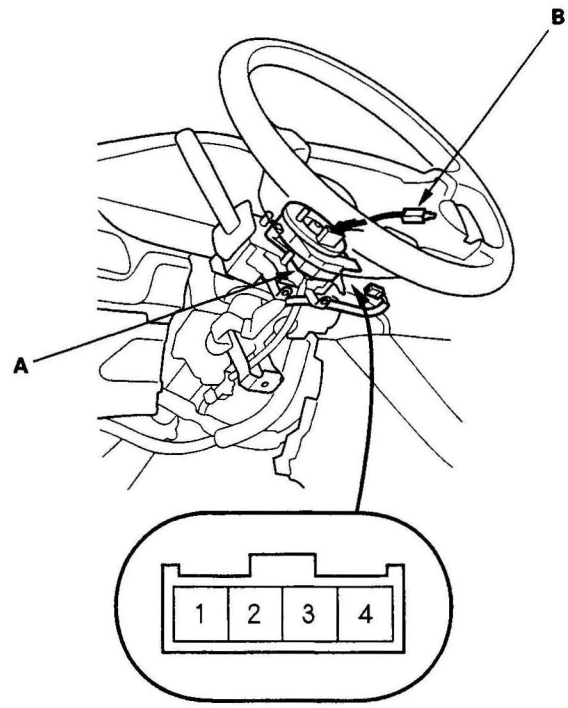
4. Check for continuity between the cable reel No.2 terminal and body ground in each switch position according to the table.

   - If there is continuity, the horn switch is OK.
   - If there is no continuity, go to step 5.

Terminal / Position	2	Body ground
Pushed	○———	———○
Released		

5. Remove the driver's airbag assembly.
6. Check for continuity between the cable reel No.2 terminal (A) and the horn switch positive terminal (B).

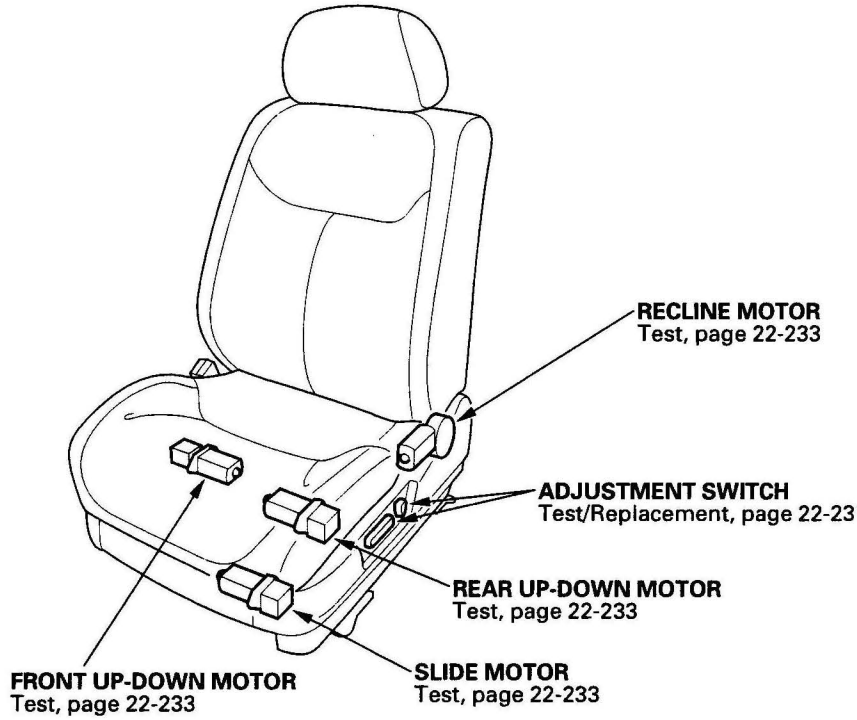
   - If there is no continuity, check the cruise control Set/Resume/Cancel switch. If the switch is OK, replace the cable reel (see page 23-219) and check for proper operation.
   - If there is continuity, replace the driver's airbag.



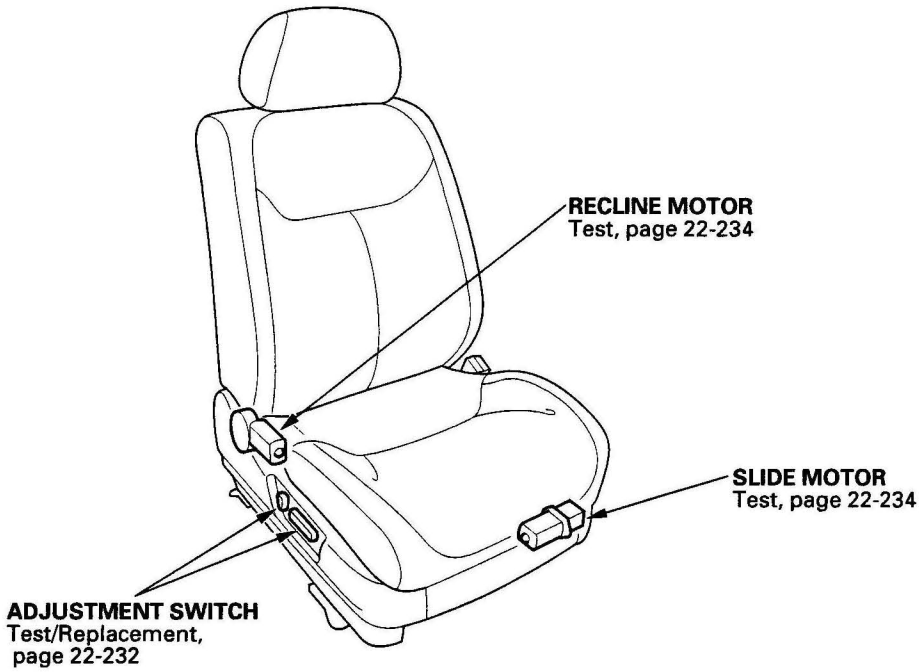
Protected by AR

Component Location Index

Driver's Power Seat (8-way Adjustable):



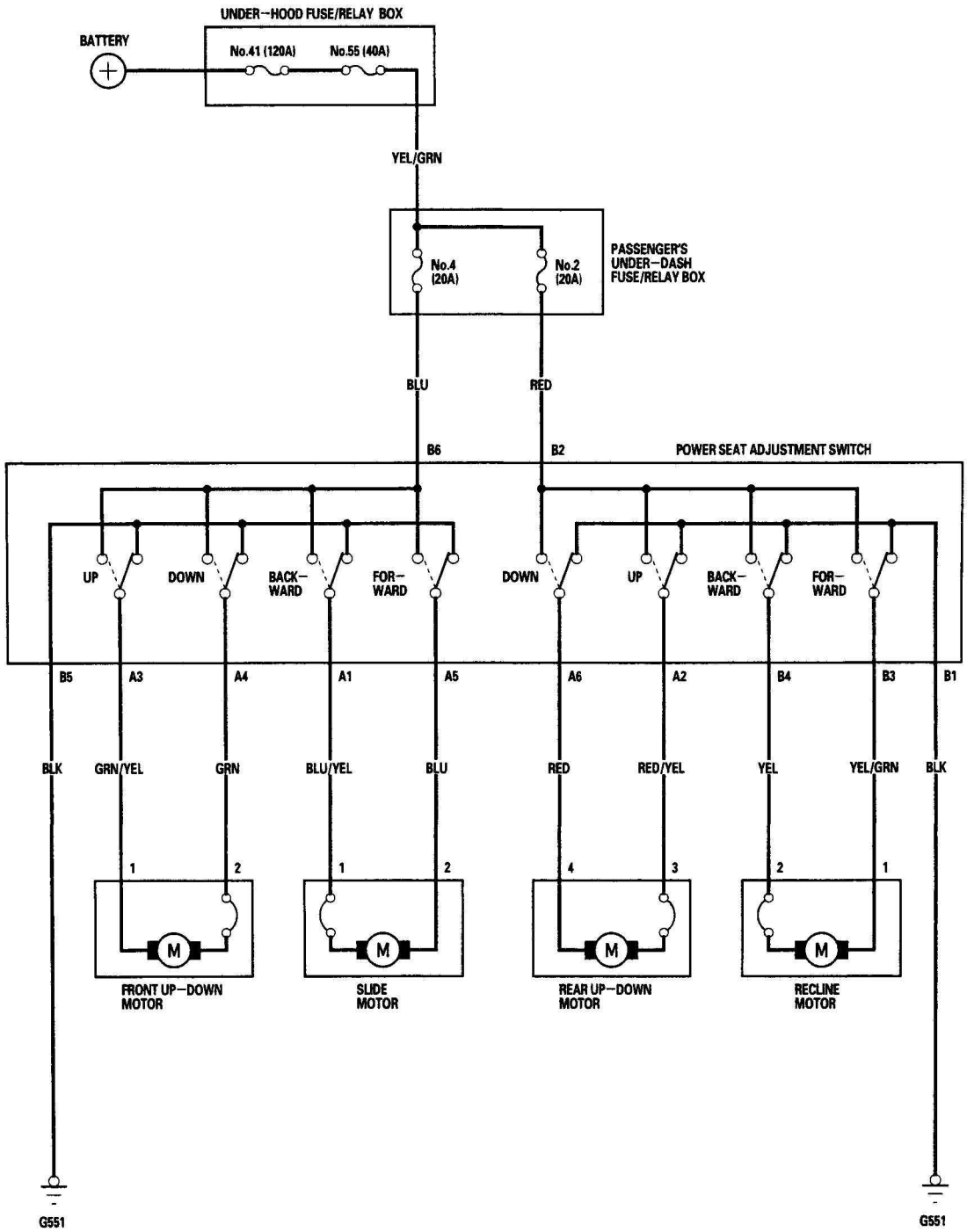
Passenger's Power Seat (4-way Adjustable):



BACK

Protected by AR

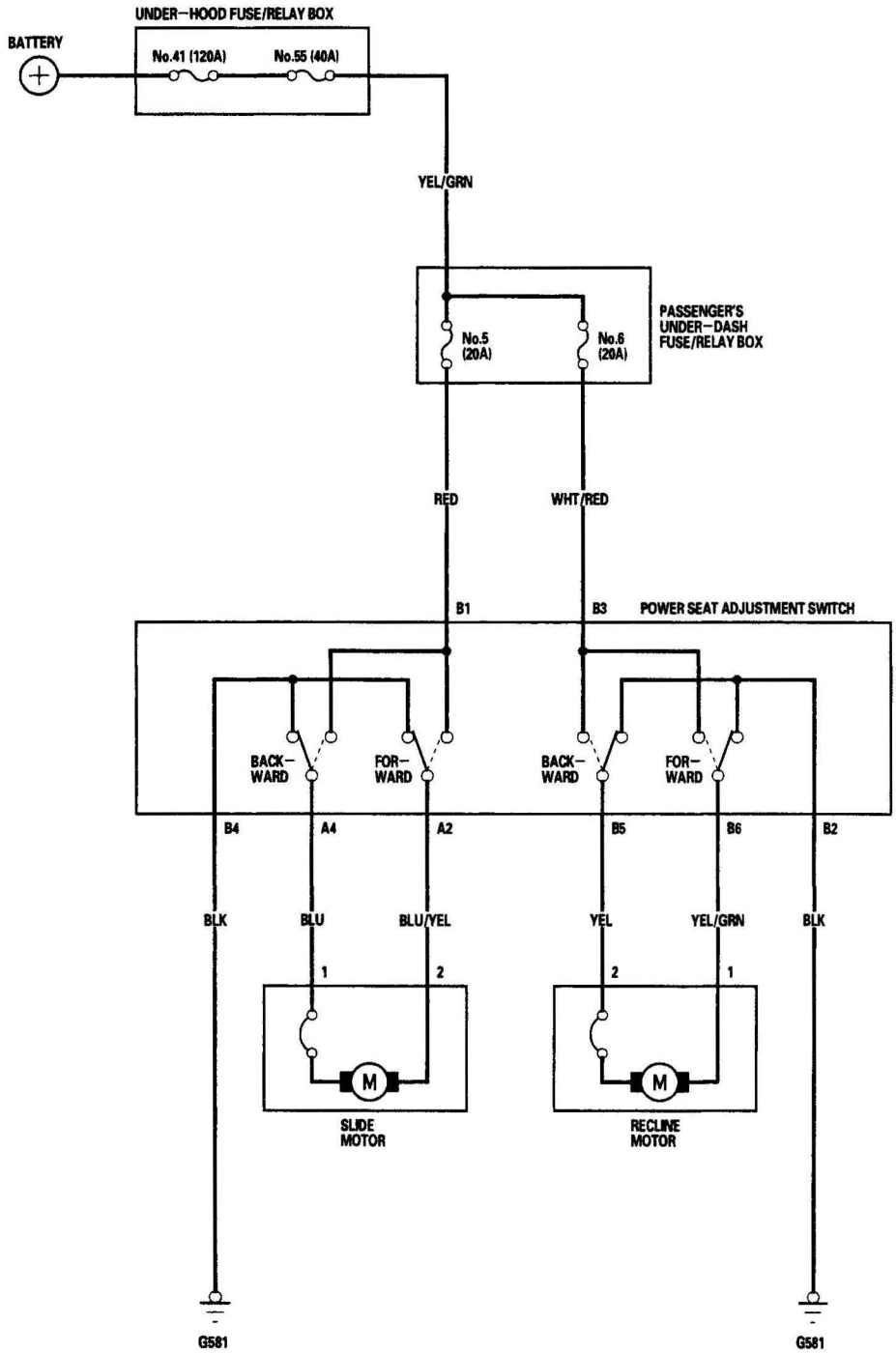
Circuit Diagram - 8-way Adjustable



BACK

Protected by AR

Circuit Diagram - 4-way Adjustable



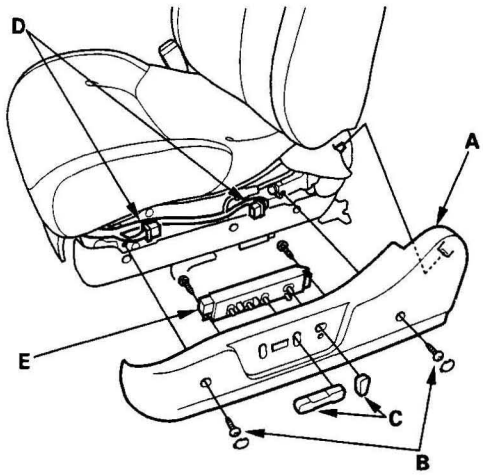
BACK

Protected by AR

Switch Test/Replacement

8-way Adjustable:

1. Remove the adjustment switch cover (A) from the driver's seat by removing the two screws (B), and pulling off the adjustment switch knobs (C).

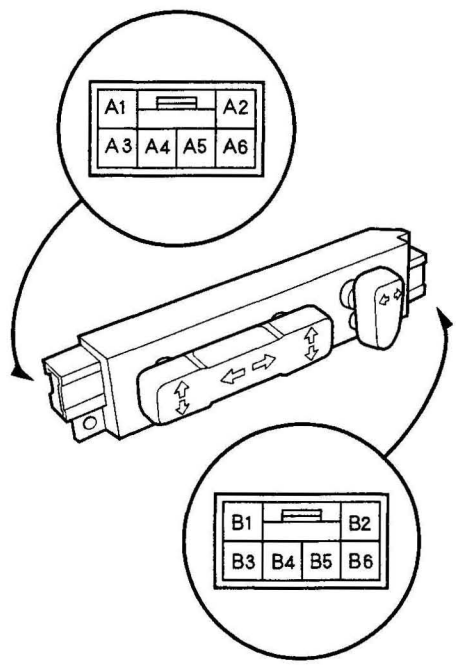


2. Disconnect the 6P connectors (D) from the adjustment switch (E), then remove the switch from the cover by removing its two mounting screws.

3. Reinstall the adjustment switch knobs.

4. Check for continuity between the terminals in each switch position according to the table.

Position		Terminal A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6
SLIDE SWITCH	FOR WARD	○				○	—	—	—	—	—	●	○
	BACK WARD	○				○	—	—	—	—	—	●	○
RECLINE SWITCH	FOR WARD							○	○	—	●		
	BACK WARD							○	○	●	—		
FRONT UP-DOWN SWITCH	UP			○	●	—	—	—	—	—	—	●	○
	DOWN			●	○	—	—	—	—	—	—	●	○
REAR UP-DOWN SWITCH	UP		○	—	—	—	●	○					
	DOWN		○	—	—	—	●	○					



5. If the continuity is not as specified, replace the switch.

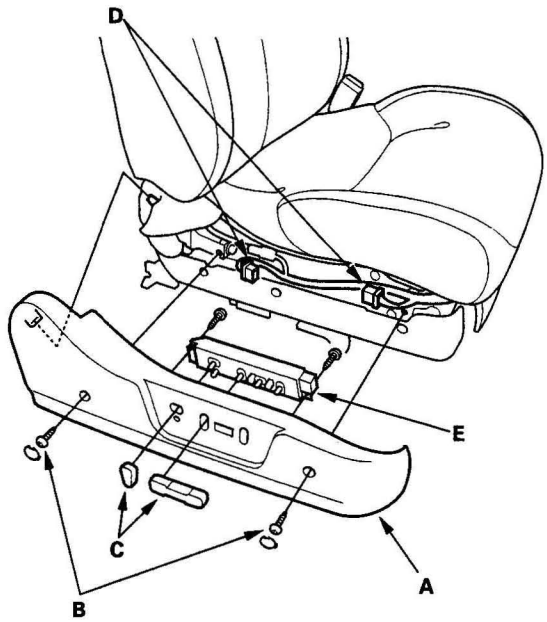
(cont'd)

Protected by AR

Switch Test/Replacement (cont'd)

4-way Adjustable:

1. Remove the adjustment switch cover (A) from the passenger's seat by removing the two screws (B), and pulling off the adjustment switch knobs (C).

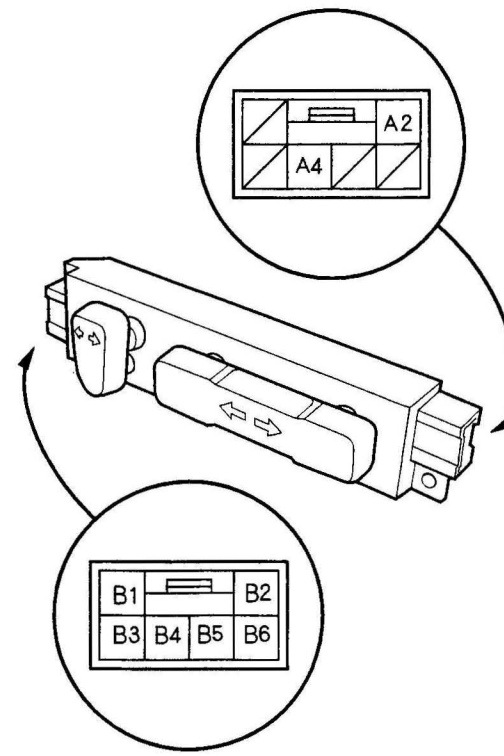


2. Disconnect the 6P connectors (D) from the adjustment switch (E), then remove the switch from the cover by removing its two mounting screws.

3. Reinstall the adjustment switch knobs.

4. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal		A2	A4	B1	B2	B3	B4	B5	B6
SLIDE SWITCH	FOR WARD		○			○			
		○					○		
	BACK WARD	○				○			
			○				○		
RECLINE SWITCH	FOR WARD			○					○
					○			○	
	BACK WARD			○				○	
					○				○



5. If the continuity is not as specified, replace the switch.

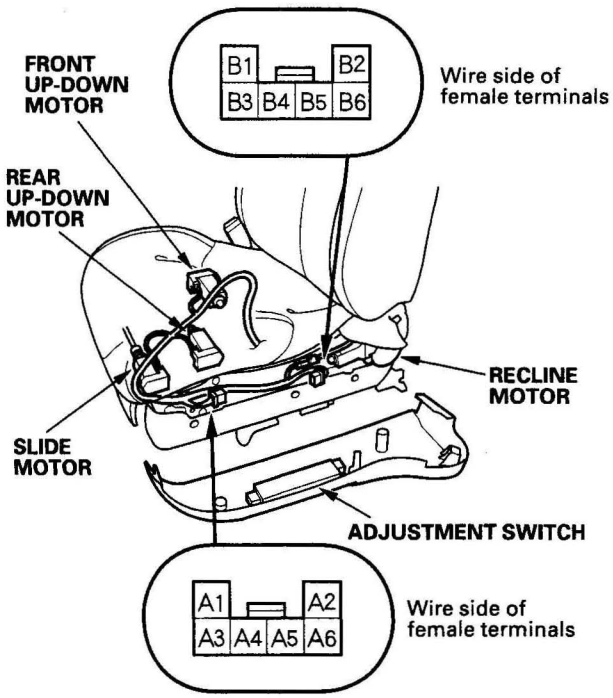
BACK

Protected by AR

Motor Test

8-way Adjustable:

1. Remove the driver's seat (see page 20-78).
2. Disconnect the 6P connectors from the adjustment switch.



3. Test the motor. When the motor stops running, disconnect battery power immediately.

Recline motor:

Terminal / Position	B3	B4
Forward	⊕	⊖
Backward	⊖	⊕

Slide motor:

Terminal / Position	A1	A5
Forward	⊖	⊕
Backward	⊕	⊖

Front up-down motor:

Terminal / Position	A3	A4
UP	⊕	⊖
DOWN	⊖	⊕

Rear up-down motor:

Terminal / Position	A2	A6
UP	⊕	⊖
DOWN	⊖	⊕

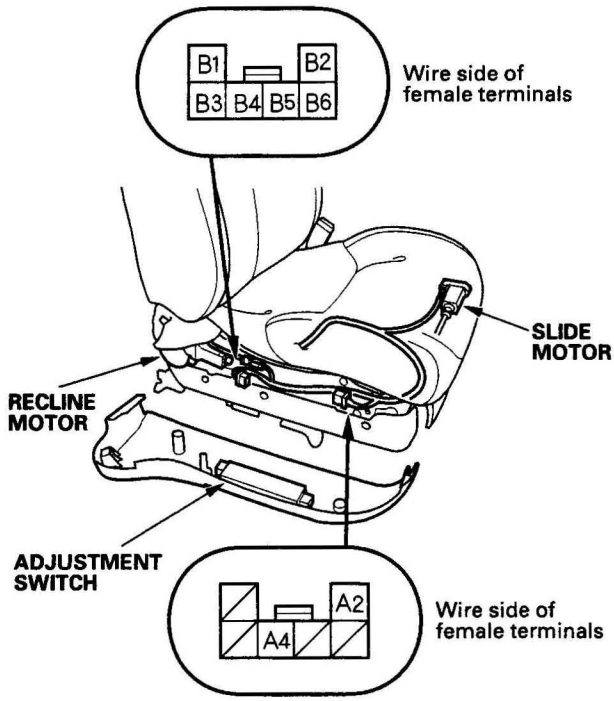
4. If the motor does not run or fails to run smoothly, check for an open in the power seat wire harness between the 6P connector and the 2P or 4P connectors. If the harness is OK, replace the motor
'99 model (see page 20-84),
'00 model (see page 20-85),
'01 model (see page 20-86).

Protected by AR

Motor Test (cont'd)

4-way Adjustable:

1. Remove the passenger's seat (see page 20-78).
2. Disconnect the 6P connectors from the adjustment switch.



3. Test the motor. When the motor stops running, disconnect battery power immediately.

Recline motor:

Terminal / Position	B5	B6
Forward	⊖	⊕
Backward	⊕	⊖

Slide motor:

Terminal / Position	A2	A4
Forward	⊖	⊕
Backward	⊕	⊖

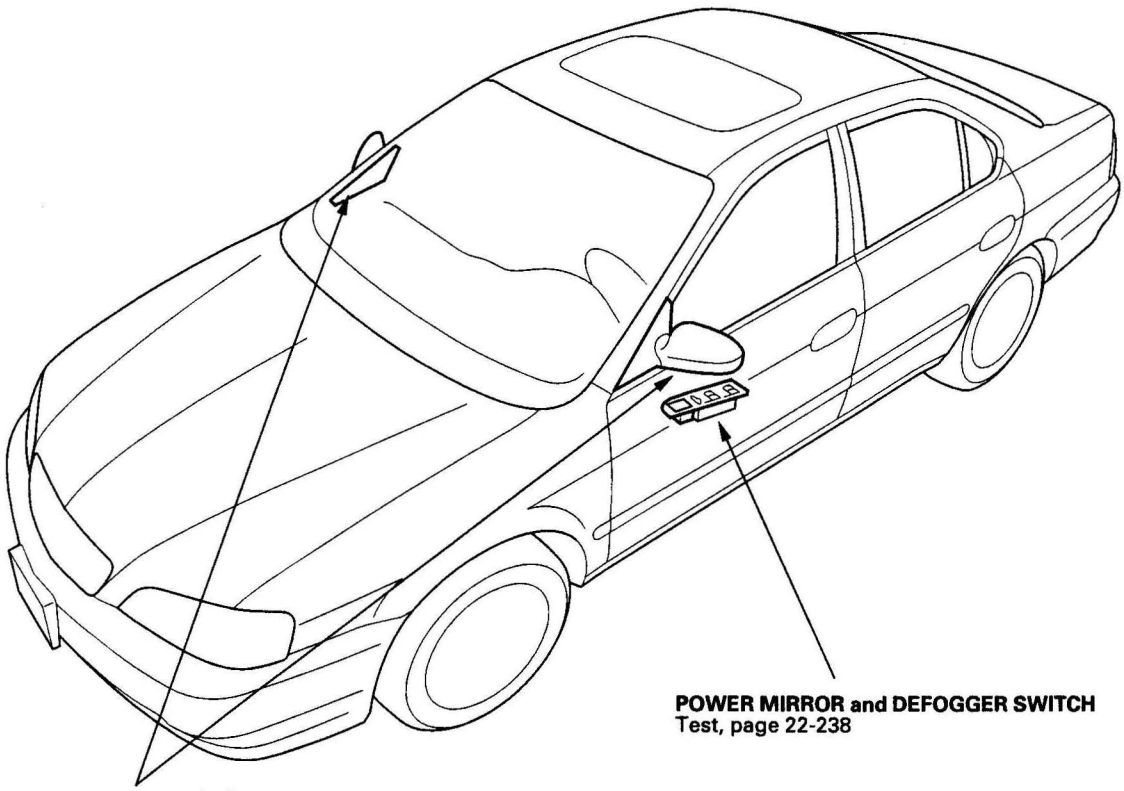
4. If the motor does not run or fails to run smoothly, check for an open in the power seat wire harness between the 6P connector and the 2P connectors. If the harness is OK, replace the motor
'99 model (see page 20-84),
'00 model (see page 20-85),
'01 model (see page 20-86).

BACK

Protected by AR

Power Mirrors

Component Location Index



POWER MIRROR and DEFOGGER SWITCH
Test, page 22-238

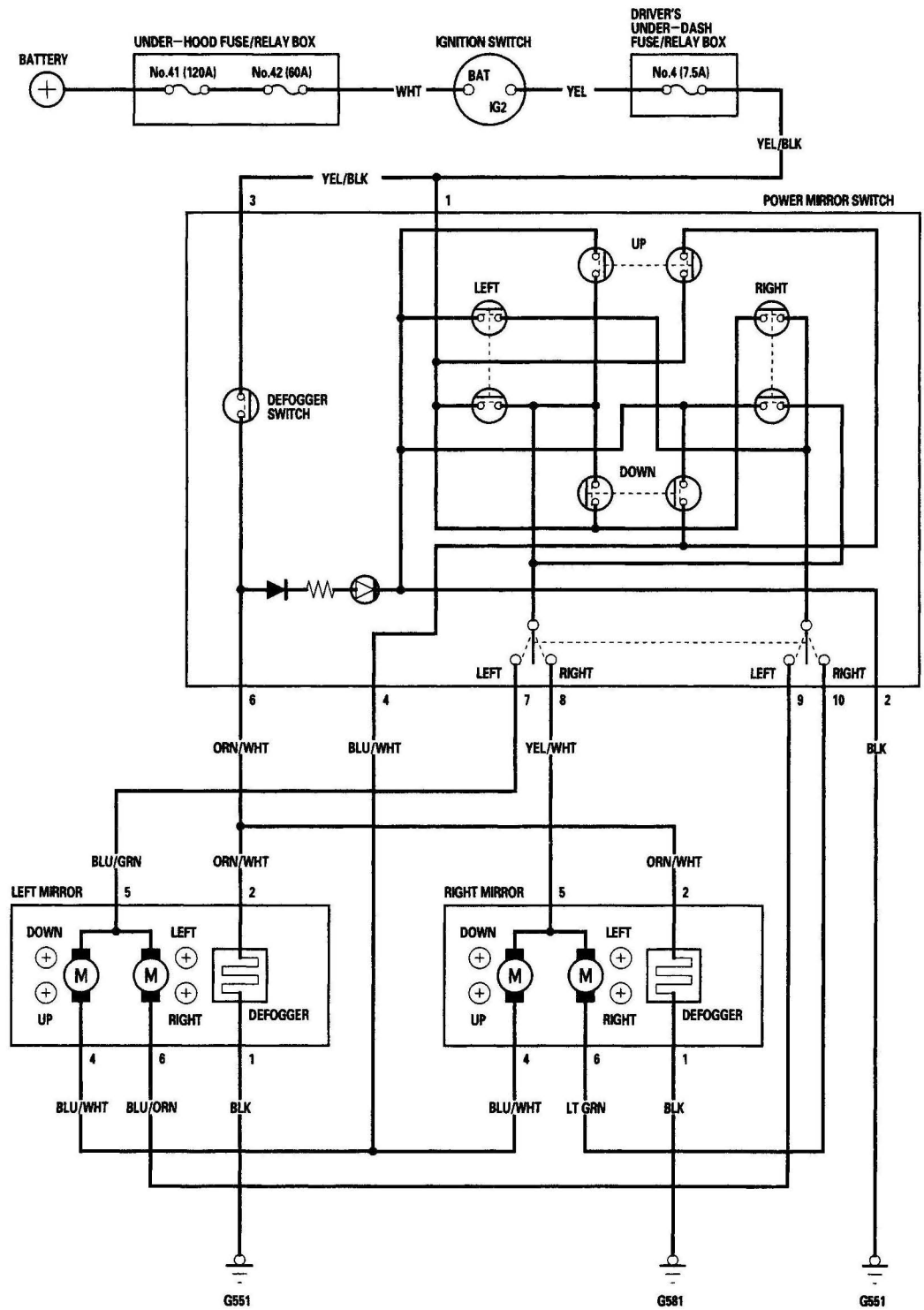
POWER MIRRORS
Function Test, page 22-237
Test, page 22-239
Replacement, page 20-25
Mirror Actuator Replacement, page 22-240

Protected by AR

Power Mirrors

Circuit Diagram

Without DPMS



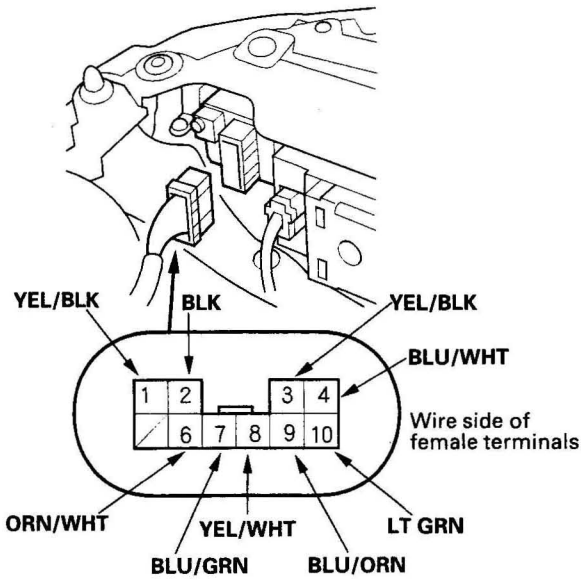
BACK

Protected by AR

Function Test

Without DPMS

1. Remove the driver's door panel (see page 20-6).



2. Disconnect the 10P connector from the power mirror switch.

3. Choose the appropriate test based on the symptom:
   - Both mirrors don't work, go to step 4.
   - Left mirror doesn't work, go to step 6.
   - Right mirror doesn't work, go to step 7.
   - Defogger doesn't work , go to step 8.

Both mirrors

4. Check for voltage between the No. 1 terminal and body ground with the ignition switch ON (II).
   There should be battery voltage.
   - If there is no battery voltage, check for:
     - blown No. 4 (7.5 A) fuse in the driver's under-dash fuse/relay box.
     - an open in the YEL/BLK wire.
   - If there is battery voltage, go to step 5.

5. Check for continuity between the No. 2 terminal and body ground.
   There should be continuity.
   - If there is no continuity, check for:
     - an open in the BLK wire.
     - poor ground (G551).
   - If there is continuity, check both mirrors individually as described in the next column.

Left mirror

6. Connect the No. 1 terminal to the No. 7 terminal, and the No. 4 (or No. 9) terminal to body ground with jumper wires. The left mirror should tilt down (or swing left) with the ignition switch ON (II).
   - If the mirror does not tilt down (or does not swing left), check for an open in the BLU/WHT (or BLU/ORN) wire between the left mirror and the 10P connector. If the wire is OK, check the left mirror actuator.
   - If the mirror neither tilts down nor swings left, repair the BLU/GRN wire.
   - If the mirror works properly, check the mirror switch.

Right mirror

7. Connect the No. 1 terminal to the No. 8 terminal, and the No. 4 (or No. 10) terminal to body ground with jumper wires. The right mirror should tilt down (or swing left) with the ignition switch ON (II).
   - If the miror does not tilt down (or does not swing left), check for an open in the BLU/WHT (or LT GRN) wire between the right mirror and the 10P connector.
     If the wire is OK, check the right mirror actuator.
   - If the mirror neither tilts down nor swings left, repair the YEL/WHT wire.
   - If the mirror works properly, check the mirror switch.

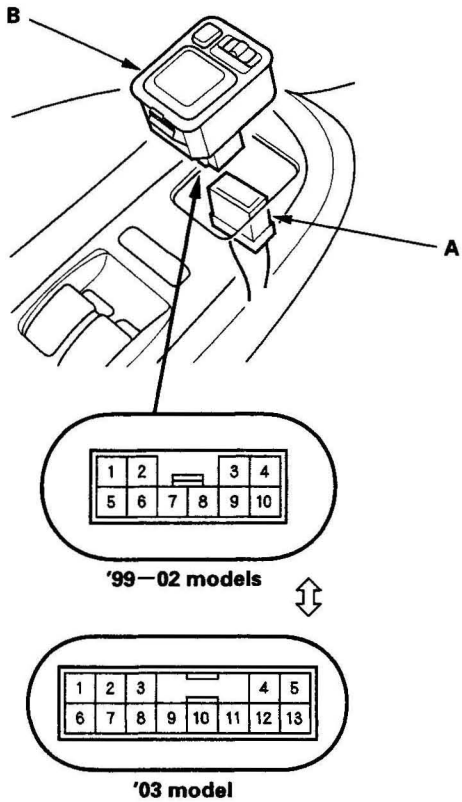
Defogger

8. Connect the No. 3 and No. 6 terminals with a jumper wire, and check for voltage between the No. 3 terminal and body ground. There should be battery voltage and both mirrors should warm up with the ignition switch ON (II).
   - If there is no voltage or neither warms up, check for:
     - an open in the YEL/BLK and ORN/WHT wires.
     - blown No. 4 (7.5 A) in the driver's under-dash fuse/relay box.
     - poor ground (G551, G581).
   - If only one fails to warm up, check its defogger.
   - If both warm up, check the defogger switch.

Protected by AR

Power Mirror and Mirror Defogger Switch Test

1. Disconnect the 10P connector or 13P connector (A) from the power mirror switch (B).



2. Check for continuity between the terminals in each switch position according to the table.

Mirror Switch:

	Terminal / Position	1 [2]	2 [6]	4 [5]	7 [10]	8 [11]	9 [12]	10 [13]
L	UP	○		○				
			○		○			
	DOWN	○		○				
			○		○			
	LEFT	○		○				
			○				○	
	RIGHT	○		○				
			○		○			
R	UP	○		○				
			○			○		
	DOWN	○		○				
			○			○		
	LEFT	○		○				
			○			○		
	RIGHT	○		○				
			○			○		

Defogger Switch:

Terminal / Position	3 [1]	6 [8]
ON	○	○
OFF		

[] : '03 model

3. If the continuity is not as specified, replace the switch.

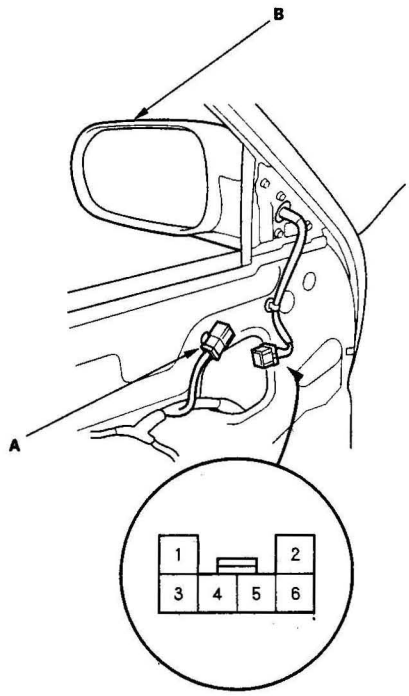
BACK

Protected by AR

Power Mirror Actuator Test

'99-01 models:

1. Remove the door panel (see page 20-6).
2. Disconnect the 6P connector (A) from the power mirror (B).



Wire side of female terminals

3. Check actuator operation by connecting power and ground according to the table.

Terminal / Position	4	5	6
TILT UP	⊕	⊖	
TILT DOWN	⊖	⊕	
SWING LEFT		⊕	⊖
SWING RIGHT		⊖	⊕

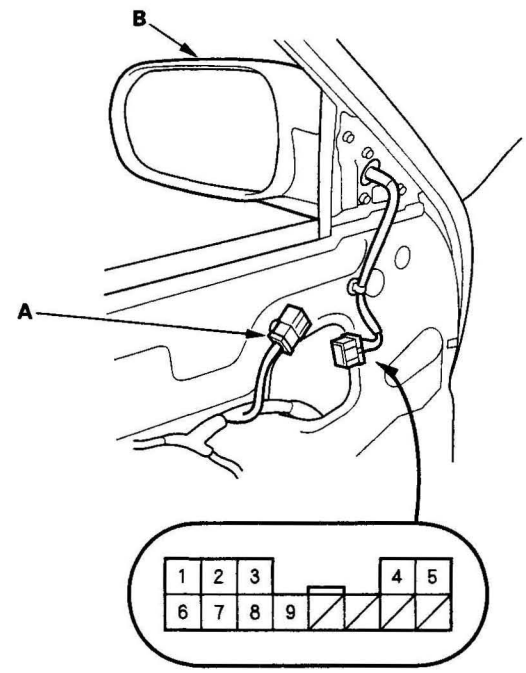
4. If the mirror fails to work properly, replace the mirror actuator.

Defogger Test

5. Check for continuity between the No. 1 and No. 2 terminals of the 6P connector. There should be continuity.
6. If the continuity is not as specified, replace the switch.

'02-03 models:

1. Remove the door panel (see page 20-6).
2. Disconnect the 13P connector (A) from the power mirror actuator (B).



Wire side of female terminals

3. Check actuator operation by connecting power and ground according to the table.

Terminal / Position	6	7	8
TILT UP		⊖	⊕
TILT DOWN		⊕	⊖
SWING LEFT	⊖	⊕	
SWING RIGHT	⊕	⊖	

4. If the mirror fails to work properly, replace the mirror actuator.

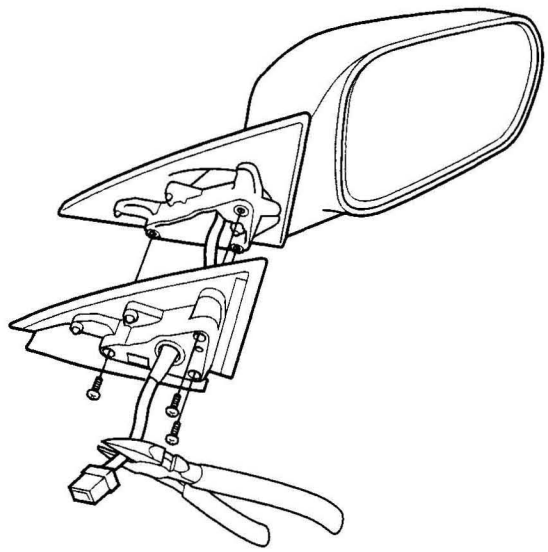
Defogger Test

5. Check for continuity between the No. 4 and No. 5 terminals of the 13P connector. There should be continuity.
6. If the continuity is not as specified, replace the switch.

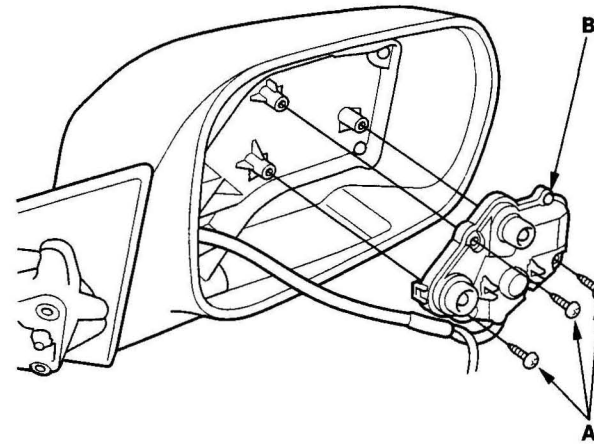
Protected by AR

Power Mirror Actuator Replacement

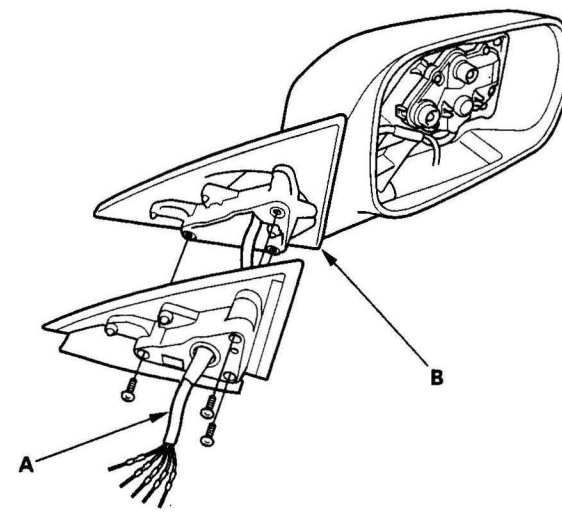
1. Remove the power mirror from the door (see page 20-25), and disconnect the 6P ('99-01 models) or 13P ('02-03 models) connector.
2. Cut the wire harness with wire cutters.



3. Record the terminal locations and wire colors.
4. Remove the mirror holder (see page 20-26).
5. Remove the three screws (A) and the actuator (B).



6. Route the wire harness (A) of the new actuator through the hole in the bracket (B).

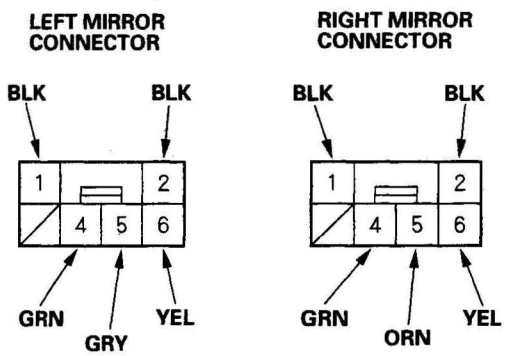


BACK

Protected by AR

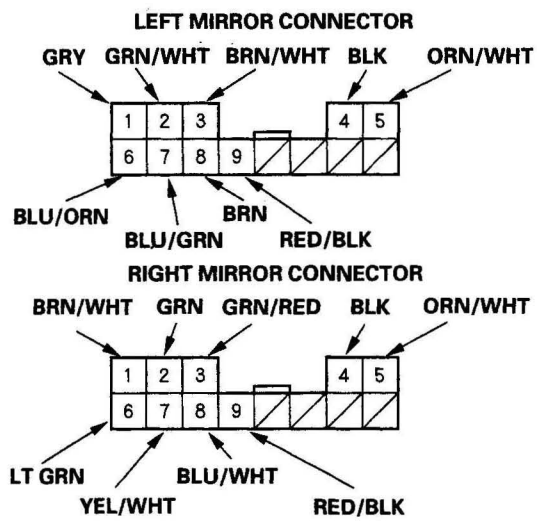
7. Insert the terminals into the connector as shown below.

'99-01 models:



Terminal side of male terminals

'02-03 models:



8. Apply tape to seal the intersection of the wire harness.

9. Reassemble in the reverse order of disassembly. Be careful not to break the mirror when reinstalling it to the actuator (see step 4 on page 20-26).

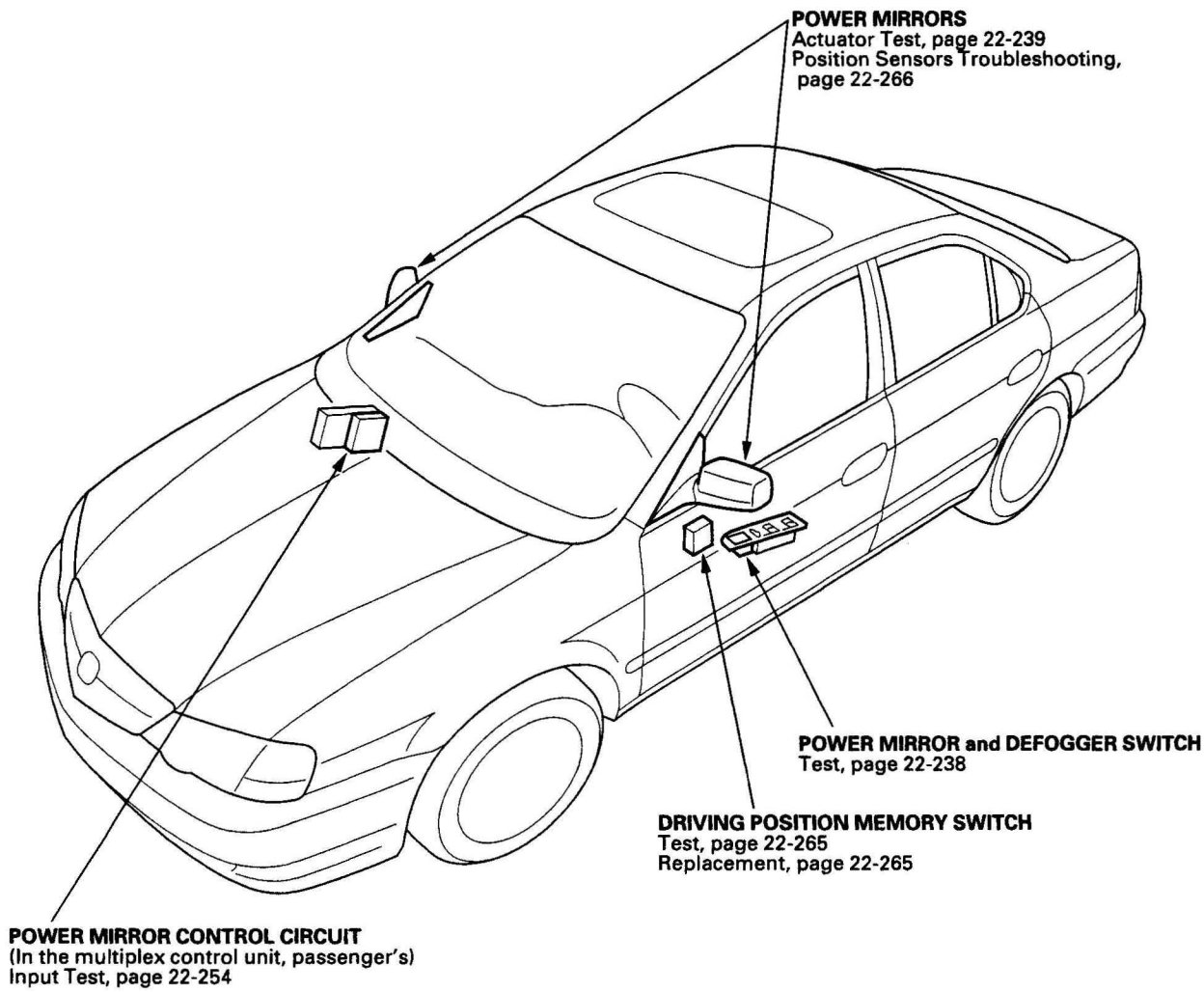
10. Reinstall the mirror assembly to the door.

11. Operate the power mirror to ensure smooth operation.

Protected by AR

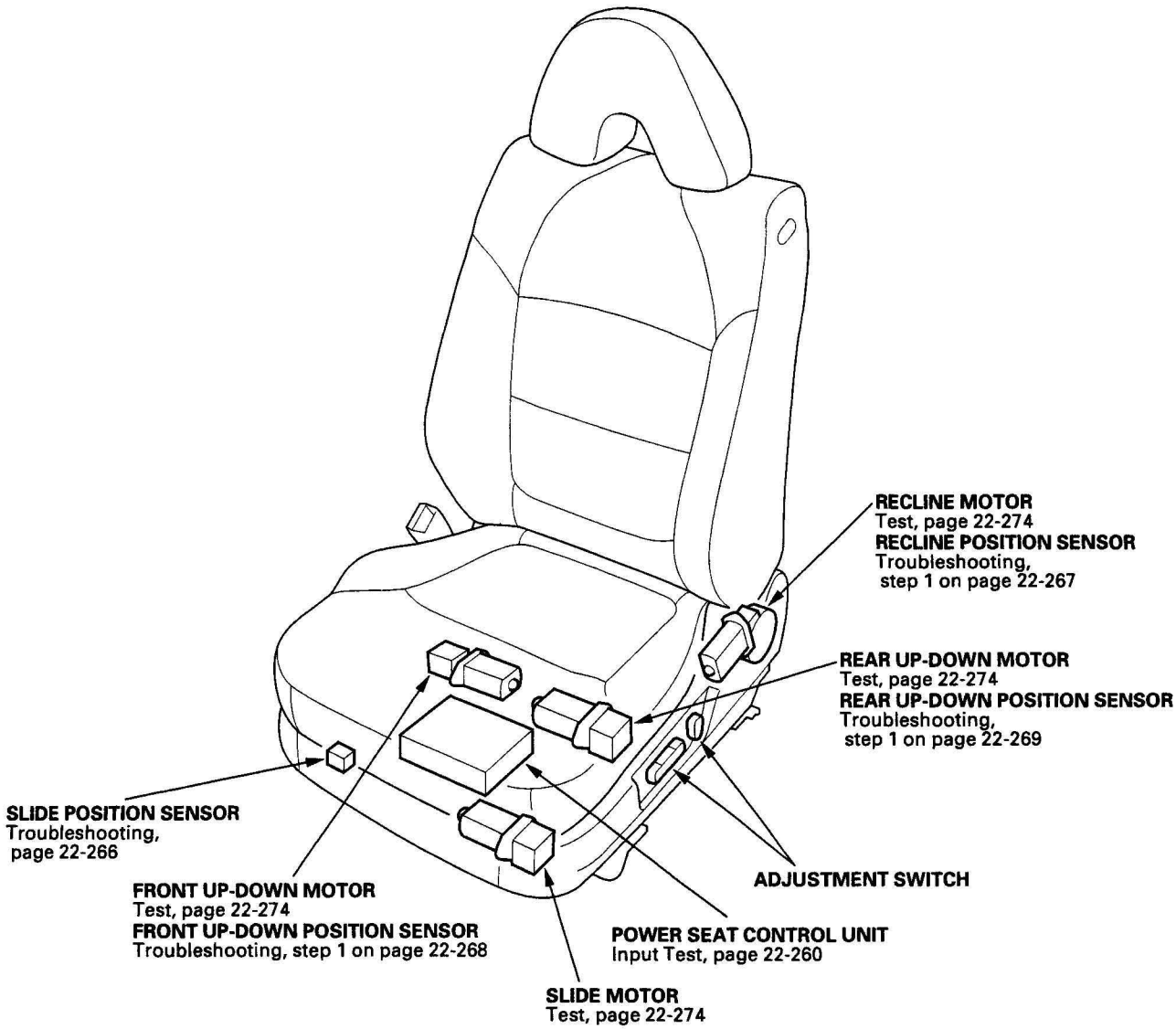
Driving Position Memory System (DPMS)

Component Location Index



BACK

Protected by AR



BACK

Protected by AR

Driving Position Memory System (DPMS)

System Descriptions

The driver's seat and the power mirrors have a memory feature. The seat and mirror adjustments can be regulated separately. All the adjustments can be memorized by pressing the MEMO button on the driving position memory switch, and then pressing one of the two position buttons within five seconds. Pressing the appropriate position button will move the seat and the mirrors to the memorized position.
Disconnecting the battery will cancel the memorized positions.

Power Seat Position Sensors:
Each motor has a reed switch sensor which detects motor rotation and sends a pulse to the power seat control unit when the motor rotates. The control unit stores the number of pulses in its memory, and the seat position is memorized.

Power Mirror Position Sensors:
By means of a Hall-effect type tilt position sensor and swing position sensor, the power mirror control circuit in the passenger's multiplex control unit detects the voltage changes caused by the movements of the mirrors.
These voltage changes are stored in memory, and the power mirror positions are memorized.

Memory Retrieval:
When one of the two buttons on the driving position memory switch is pressed with the vehicle parked (shift lever in [P]) and the driver door closed, the seat and the mirrors move to the memorized positions. The remote transmitters will also activate the DPMS.

BACK

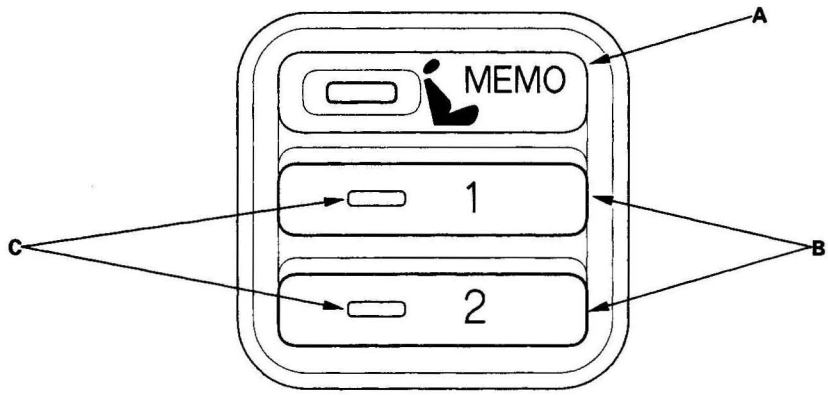
Protected by AR

General Troubleshooting Infomation

The self-diagnostic function of the driving position memory system detects system problems. This information can be retrieved by displaying diagnostic trouble code.

Displaying the Diagnostic Trouble Code (DTC)

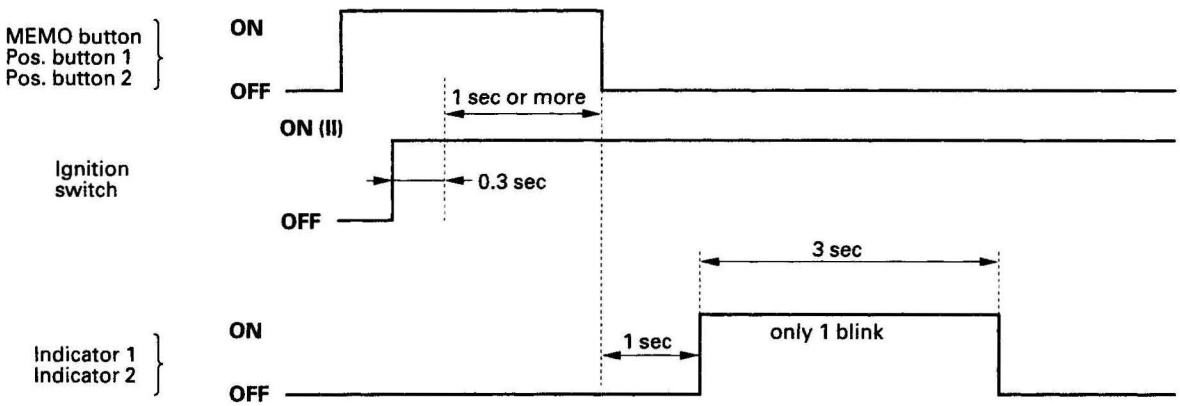
1. Turn the ignition switch OFF, and move the seat to a non-memorized position.
2. Press the MEMO button (A) and both position buttons (B) at the same time, and hold them.



3. Turn the ignition switch ON (II), and wait at least 1 second, then release the three buttons.
4. After 1 second, the position button indicators (C) will blink to show the DTC.

DTC Indications
No System Problem Pattern:

If there is no DTC stored, the indicators blink only once (3 seconds).



(cont'd)

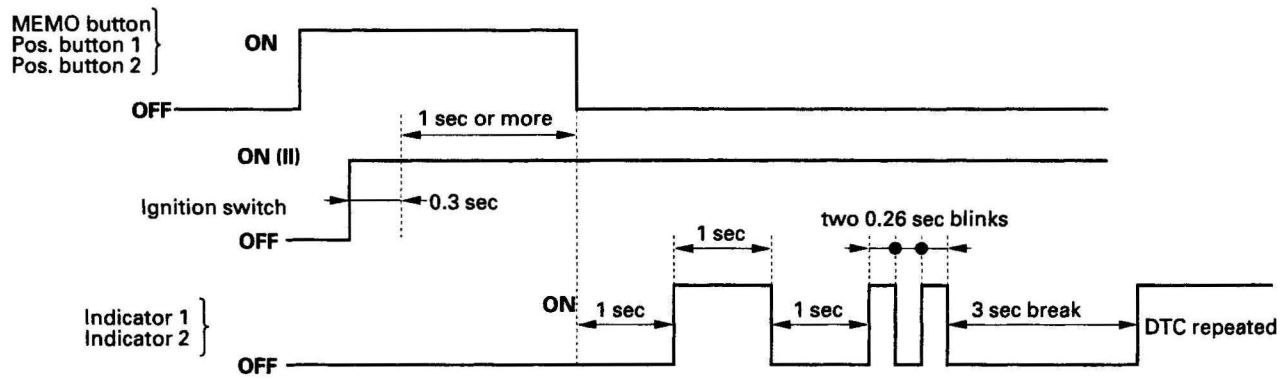
BACK

Protected by AR

General Troubleshooting Infomation (cont'd)

System Problem Pattern:

If a system problem has occurred, the DTC is stored, the indicators flash the DTC. The first digit is indicated by the number of long (1 second) blinks, and the second digit is indicated by the number of short (0.26 second) blinks. There is a 3 second break between each DTC when there are multiple DTCs.



Canceling the DTC Indication

- Turn the ignition switch OFF or
- Press the MEMO button, or the position button 1, or the position button 2, or
- Press one of the driving position adjustment switches.

Erasing the DTC from Memory

Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset button. Disconnect the battery negative cable for at least 30 seconds. After reconnecting the battery, enter the anti-theft code for the radio, then enter the customer's radio station presets.

BACK

Protected by AR

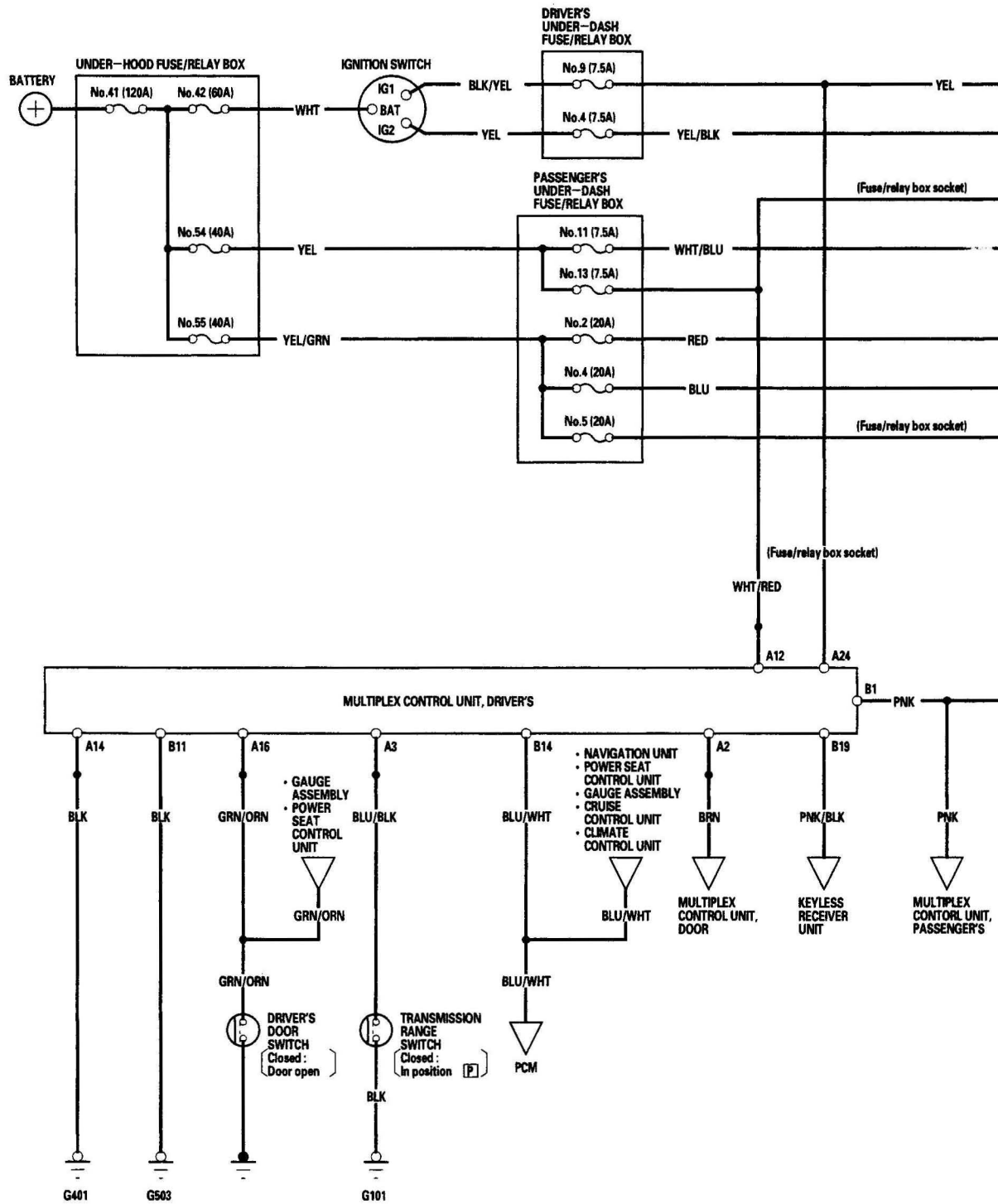
Diagnostic Trouble Code (DTC) Index

DTC	Symptom	Possible Cause	Page
31	Seat can't be adjusted at all	Faulty power seat adjustment switch, or power seat control unit	(see page 22-260) for driver's power seat control unit input test (see page 22-254) for power seat adjustment switch test
32	Positions can't be stored or retrieved with the driving position memory switch (failure to write or read in the power seat control unit)	Faulty driving position memory switch, power seat control unit	(see page 22-260) for power seat control unit input test (see page 22-265) for driving position memory switch test
33	Positions can't be stored or retrieved with the driving position memory switch (failure to write or read in the passenger's multiplex control unit)	Faulty driving position memory switch, or passenger's multiplex control unit	(see page 22-260) for power seat control unit input test (see page 22-254) for multiplex control unit input troubleshooting (see page 22-265) for driving position memory switch test
37	Seat can't be adjusted or can be adjusted even when the vehicle moving	Faulty transmission range switch, or vehicle speed sensor circuit	(see page 14-144) for transmission range switch test (see page 14-105) for countershaft speed sensor test (see page 22-129) for vehicle speed sensor circuit troubleshooting

Protected by AR

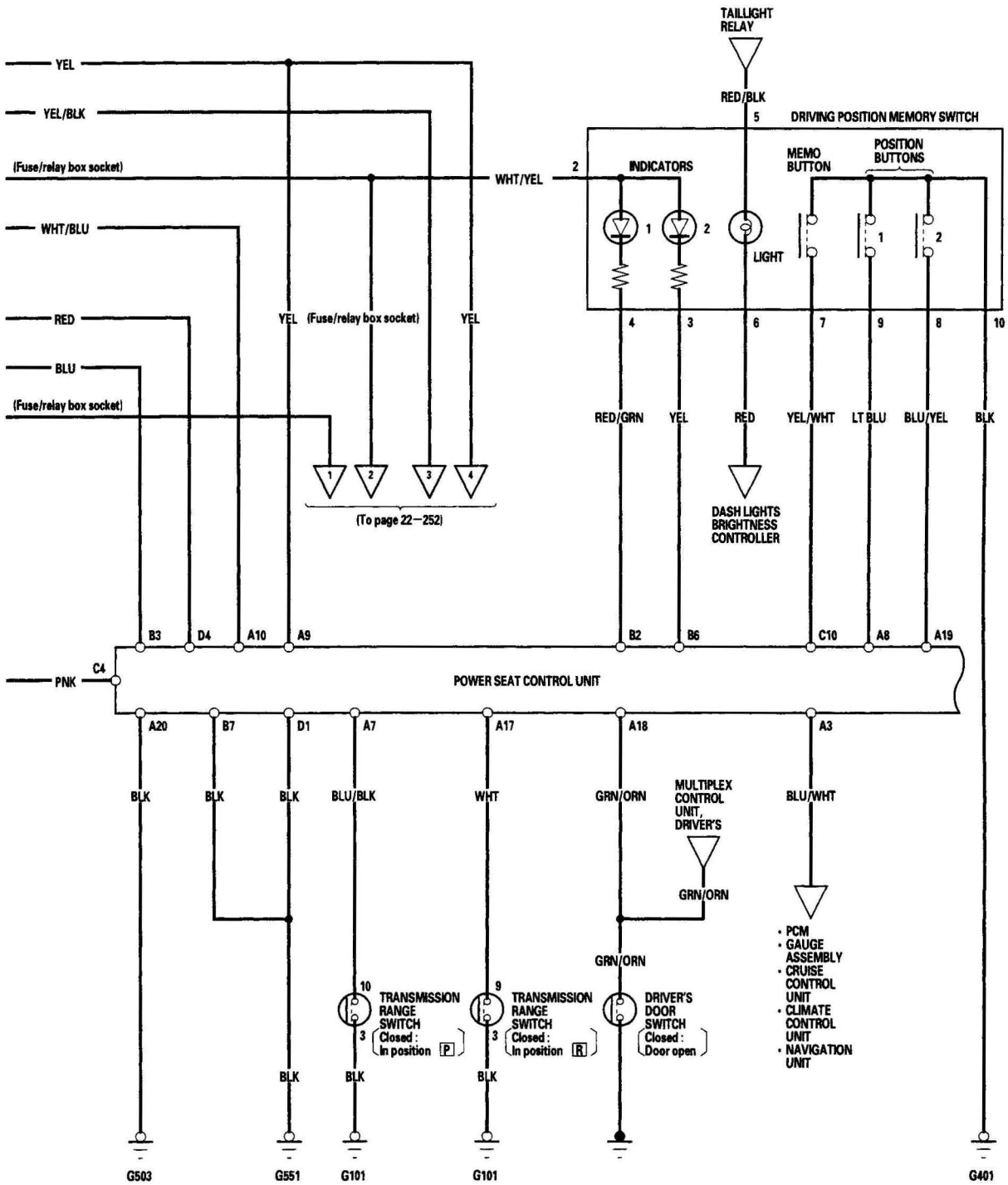
Driving Position Memory System (DPMS)

Circuit Diagram



BACK

Protected by AR



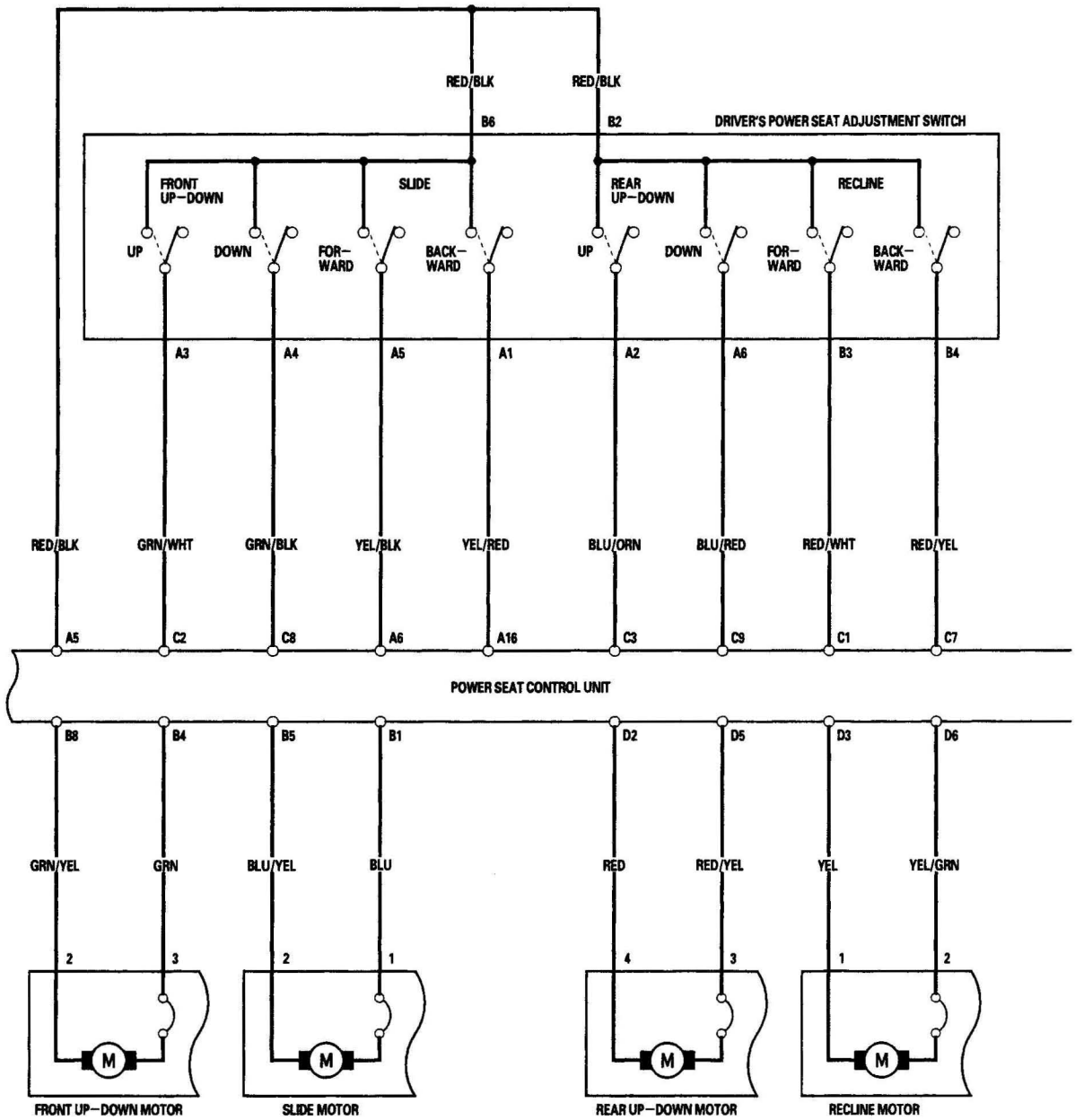
(cont'd)

BACK

Protected by AR

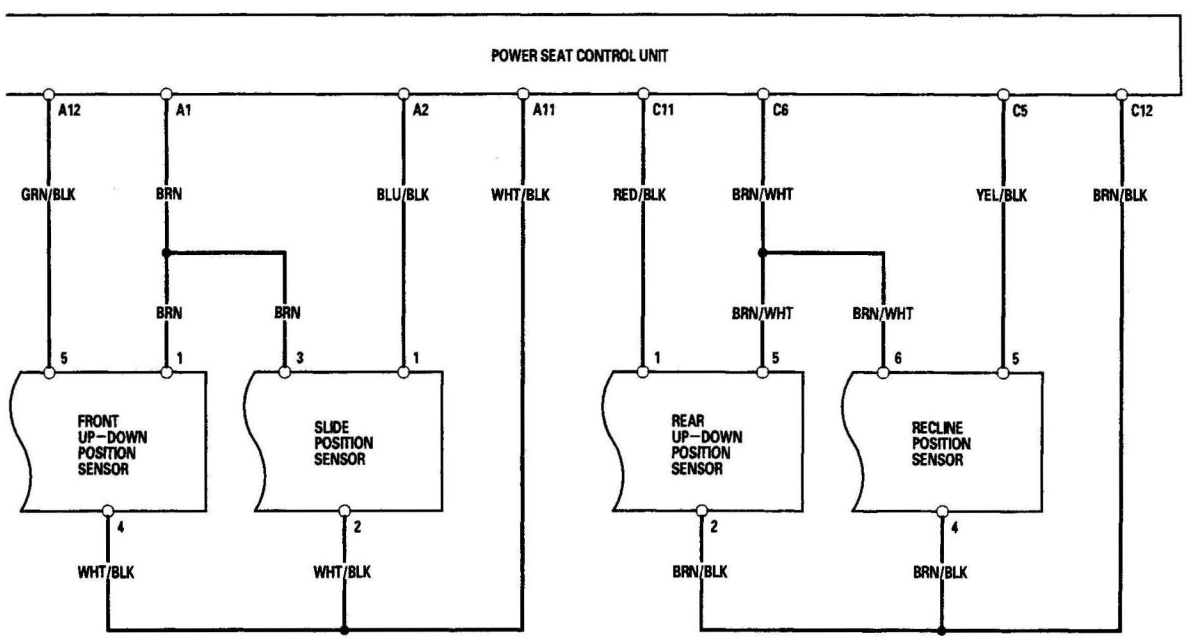
Driving Position Memory System (DPMS)

Circuit Diagram (cont'd)



BACK

Protected by AR

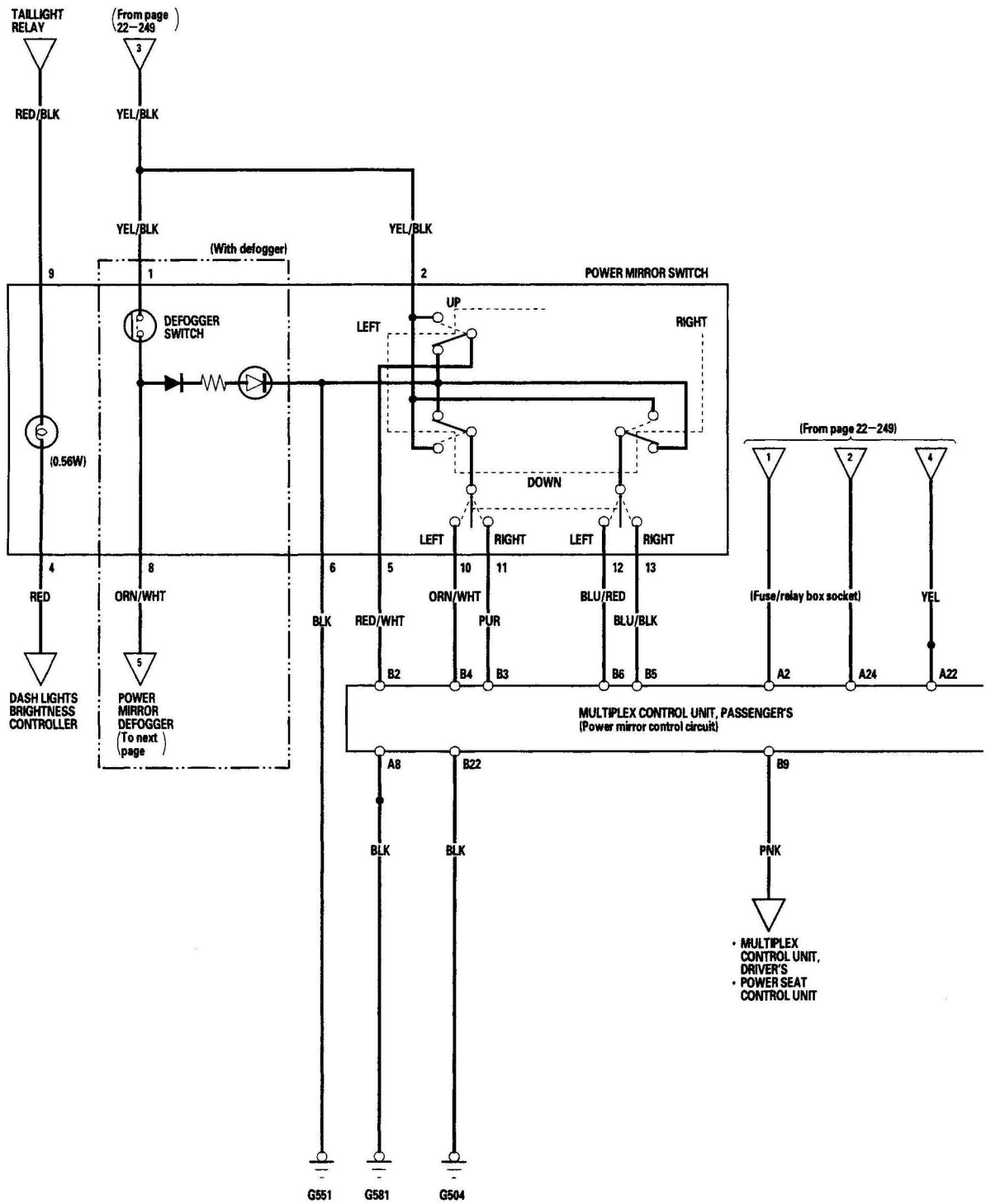


(cont'd)

BACK

Protected by AR

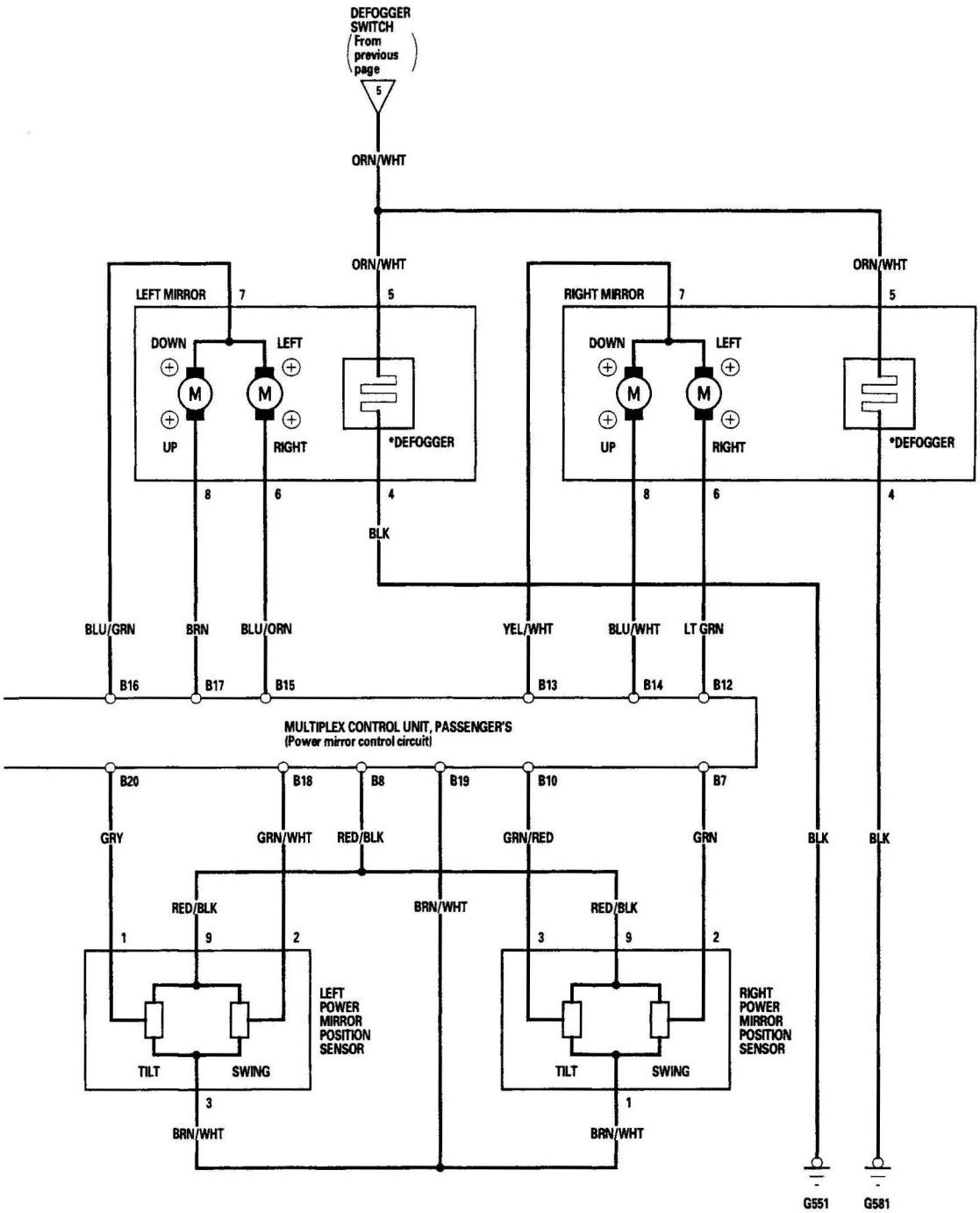
Circuit Diagram (cont'd)



BACK

Protected by AR

* With defogger



BACK

Protected by AR

Control Unit Input Test

1. Before testing the driving position memory control functions, troubleshoot the multiplex control system. Perform the multiplex mode test first.

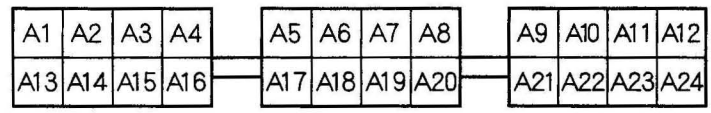
Multiplex Control Unit, Passenger's:

2. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

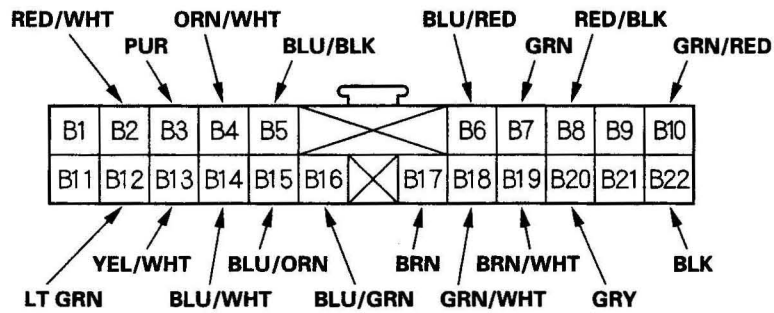
3. Inspect all connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

FUSE/RELAY BOX SOCKET

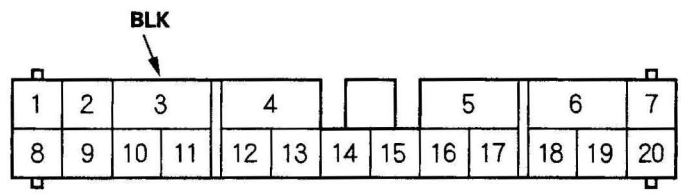


MULTIPLEX CONTROL UNIT, PASSENGER'S CONNECTOR B



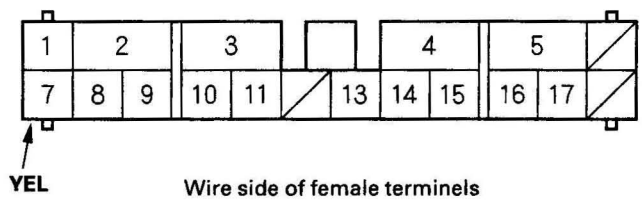
Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR H



Wire side of female terminels

BACK

Protected by AR

4. With the connectors still disconnected, make these input tests at the connectors.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G581) • An open in the wire
B22	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G504) • An open in the wire
A2	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 55 (40 A) fuse in the under-hood fuse/relay box • Blown No. 5 (20 A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's fuse/relay box
H7	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A24	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40 A) fuse in the under-hood fuse/relay box • Blown No. 13 (15 A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's fuse/relay box
B5	BLU/BLK	Ignition switches ON (II) and power mirror selector switch to right, then press the power mirror switch "Right" or "Down".	Check for voltage to ground: There should be battery voltage.	• Blown No. 4 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire
B3	PUR	Ignition switch ON (II) and power mirror selector switch to right, then press the power mirror switch "Left" or "Down".	Check for voltage to ground: There should be battery voltage.	• Blown No. 4 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire
B2	RED/WHT	Ignition switch ON (II) and press the power mirror switch "UP".	Check for voltage to ground: There should be battery voltage.	• Blown No. 4 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire
B6	BLU/RED	Ignition switch ON (II) and power mirror selector switch to left, then press the power mirror switch "Right" or "Down".	Check for voltage to ground: There should be battery voltage.	• Blown No. 4 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire
B4	ORN/WHT	Ignition switch ON (II) and power mirror selector switch to left, then press the power mirror switch "Left" or "Down".	Check for voltage to ground: There should be battery voltage.	• Blown No. 4 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty power mirror switch • An open in the wire

(cont'd)

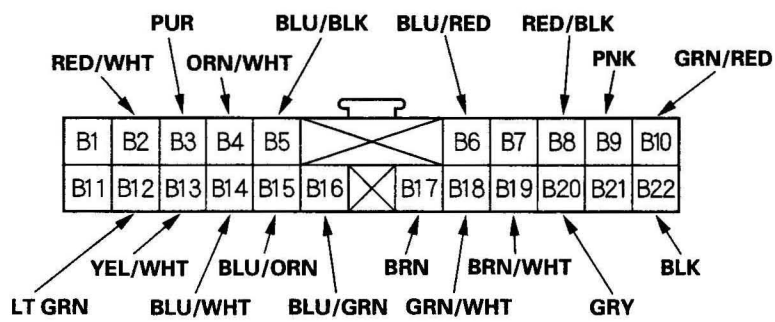
BACK

Protected by AR

Control Unit Input Test (cont'd)

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B13 · B12	YEL/WHT · LT GRN	Connect battery power to B13 terminal and B12 terminal to B22 terminal momentarily	Check right power mirror actuator operation: The mirror should swing left.	• Faulty right power mirror actuator • An open in the wire
B13 · B14	YEL/WHT · BLU/WHT	Connect battery power to B13 terminal and B14 terminal to B22 terminal momentarily.	Check right power mirror actuator operation: The mirror should tilt down.	• Faulty right power mirror actuator • An open in the wire
B16 · B15	BLU/GRN · BLU/ORN	Connect battery power to B16 terminal and B15 terminal to B22 terminal momentarily.	Check left power mirror actuator operation: The mirror should swing left.	• Faulty left power mirror actuator • An open in the wire
B16 · B17	BLU/GRN · BRN	Connect battery power to B16 terminal and B17 terminal to B22 terminal momentarily.	Check left power mirror actuator operation: The mirror should tilt down.	• Faulty left power mirror actuator • An open in the wire

MULTIPLEX CONTROL UNIT, PASSENGER'S CONNECTOR B



Wire side of female terminals

BACK

Protected by AR

5. Reconnect the passenger's multiplex control unit to the passenger's under-dash fuse/relay box, and make these input tests at the appropriate connectors on the passenger's under-dash fuse/relay box.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B8 . B19	RED/BLK . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: There should be about 5 V.	• Faulty power mirror position sensor • Faulty passenger's multiplex control unit • A short to ground
B7 . B19	GRN . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: The voltage should change from about 1 V to 3 V when the right mirror swings from left to right	• Faulty power mirror position sensor • An open in the wire • A short to ground
B10 . B19	GRN/RED . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: The voltage should change from about 1 V to 3 V when the right mirror tilts from up to down.	• Faulty power mirror position sensor • An open in the wire • A short to ground
B18 . B19	GRN/WHT . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: The voltage should change from about 1 V to 3 V when the left mirror swings from left to right.	• Faulty power mirror position sensor • An open in the wire • A short to ground
B20 . B19	GRY . BRN/WHT	Ignition switch ON (II)	Check for voltage between the terminals: The voltage should change from about 1 V to 3 V when the left mirror tilts from up to down.	• Faulty power mirror position sensor • An open in the wire • A short to ground

(cont'd)

BACK

Protected by AR

Control Unit Input Test (cont'd)

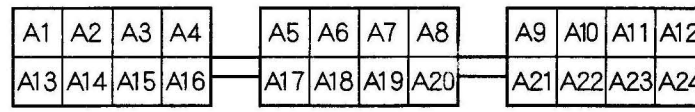
Multiplex control Unit, Driver's:

6. Remove the driver's unit from the driver's under-dash fuse/relay box, and disconnect its connector.

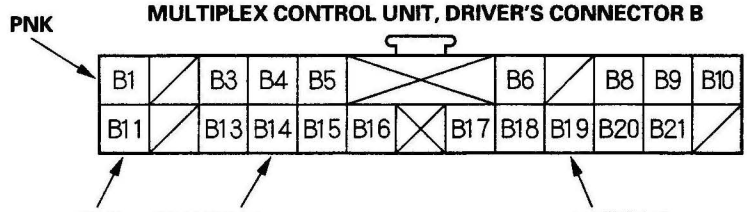
7. Inspect all connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

FUSE/RELAY BOX SOCKET

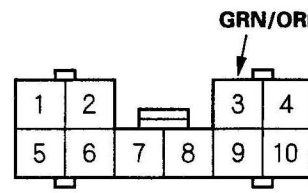


MULTIPLEX CONTROL UNIT, DRIVER'S CONNECTOR B



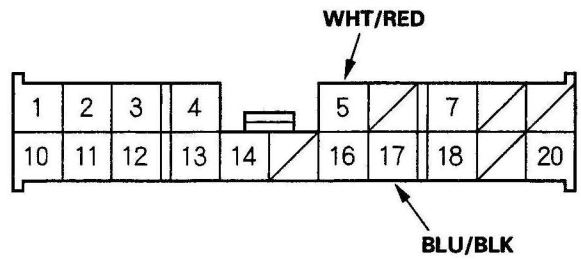
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



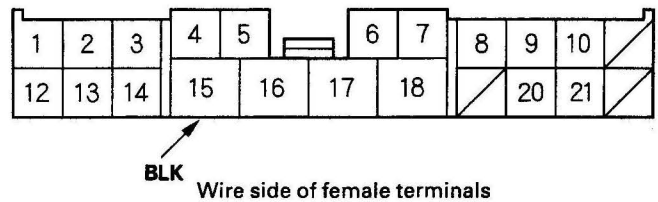
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR E



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR Q



Wire side of female terminals

BACK

Protected by AR

8. With the driver's multiplex control unit still disconnected, make these input tests at the connectors.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 9.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
Q15	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • An open in the wire
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty driver's under-dash fuse/relay box
E5	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40 A) fuse in the under-hood fuse/relay box • Blown No. 13 (15 A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
E17	BLU/BLK	Shift lever in P	Check for continuity to ground: There should be continuity.	• Poor ground (G101) • An open in the wire • Faulty transmission range switch
B14	BLU/WHT	Ignition switch OFF	With PCM connector A (32P) disconnected, check for continuity between the B14 terminal and the No.9 terminal of the PCM 32P connector A: There should be continuity.	• An open in the wire
B19	PNK/BLK	Ignition switch OFF	Check for continuity between the B19 and the keyless receiver unit terminal No.12: There should be continuity.	• An open in the wire

9. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and make these input tests at the appropriate connectors on the driver's under-dash fuse/relay box.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 10.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • Poor ground (G401)
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• An open in the wire • A short to ground

10. If all the input tests prove OK, one of the control units must be faulty, Substitute a known-good control unit for the one that is most likely at fault, then recheck the system. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely unit to be at fault, and recheck. If the system works properly, the original unit is faulty; replace it.

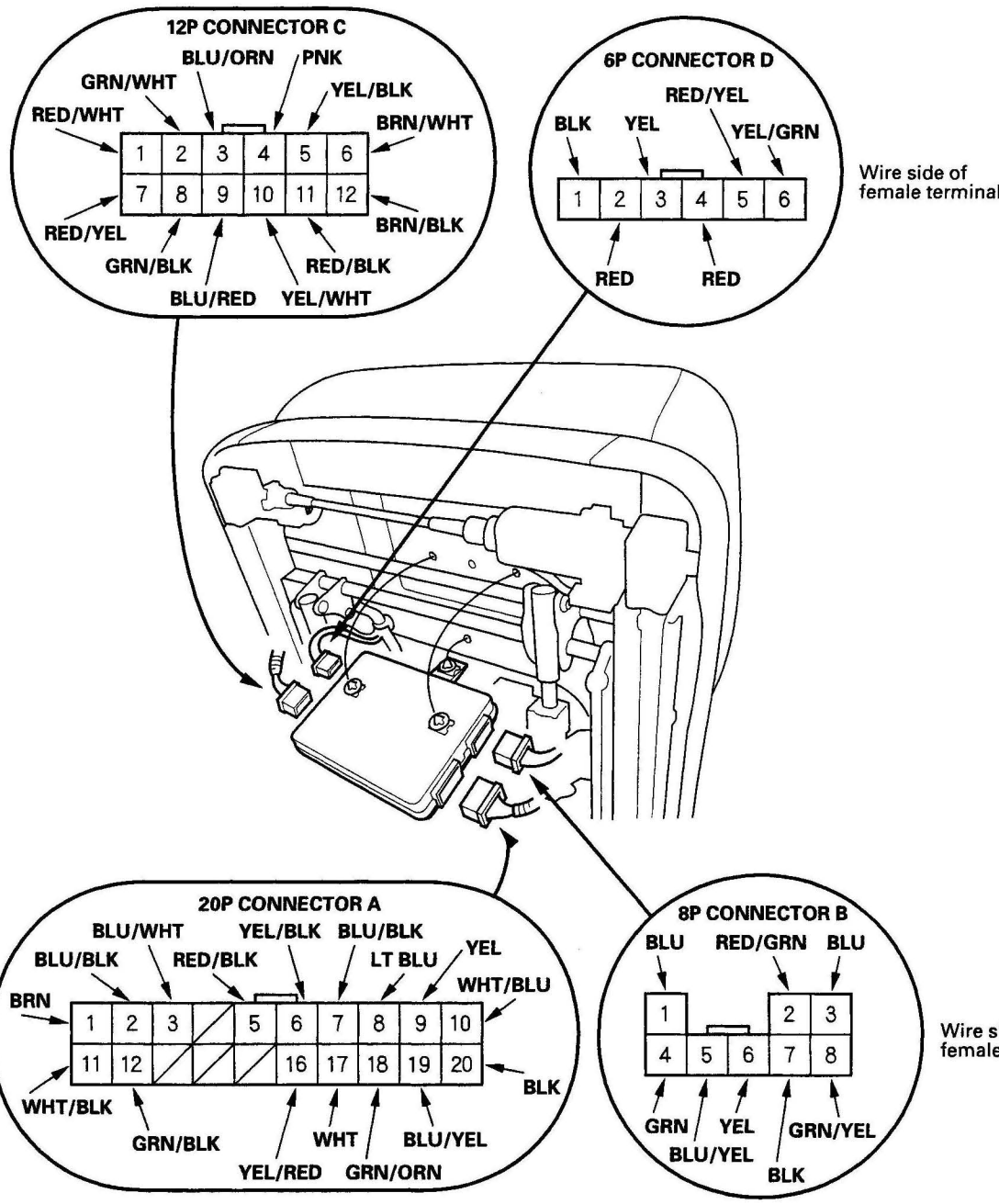
BACK

Protected by AR

Power Seat Control Unit Input Test

1. Remove the driver's power seat (see page 20-78).
   NOTE: Be careful not to scratch the interior trim.

2. Disconnect the connectors from the power seat control unit (A).



3. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary and recheck the system.
   - If the terminals look OK, go to step 4.

BACK

Protected by AR

4. With the power seat control unit still disconnected, make these input tests at the connectors.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A9	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A10	WHT/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40 A) fuse in the under-hood fuse/relay box • Blown No. 11 (7.5 A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
B3	BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 55 (40 A) fuse in the under-hood fuse/relay box • Blown No. 4 (20 A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
D4	RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 55 (40 A) fuse in the under-hood fuse/relay box • Blown No. 2 (20 A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A20	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • An open in the wire
B7 D1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G551) • An open in the wire
A3	BLU/WHT	Ignition switch OFF	With PCM connector A (32P) disconnected, check for continuity between the A3 terminal and No. 9 terminal of the PCM 32P connector A: There should be continuity.	• An open in the wire
A7	BLU/BLK	Shift lever in P	Check for continuity to ground: There should be continuity.	• Poor ground (G101) • Faulty transmission range switch • An open in the wire
A17	WHT	Shift lever in R	Check for continuity to ground: There should be continuity.	• Poor ground (G101) • Faulty transmission range switch • An open in the wire
A8	LT BLU	Push the position button 1	Check for continuity to ground: There should be continuity.	• Faulty driving position memory switch • An open in the wire
A19	BLU/YEL	Push the position button 2	Check for continuity to ground: There should be continuity.	• Faulty driving position memory switch • An open in the wire
C10	YEL/WHT	Push the MEMO button	Check for continuity to ground: There should be continuity.	• Faulty driving position memory switch • An open in the wire
B6	YEL	Ignition switch ON (II)	Attach to ground: Indicator 2 should come on.	• Faulty driving position memory switch indicator • An open in the wire
B2	RED/GRN	Ignition switch ON (II)	Attach to ground: Indicator 1 should come on.	• Faulty driving position memory switch indicator • An open in the wire

(cont'd)

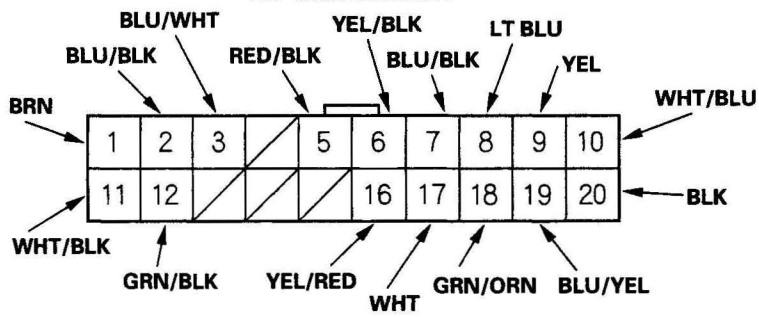
BACK

Protected by AR

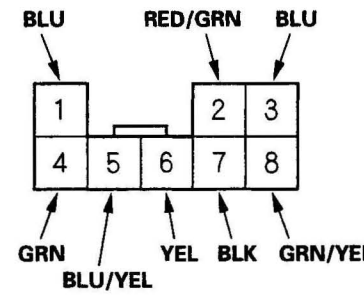
Power Seat Control Unit Input Test (cont'd)

NOTE: All connector view are from wire side of female terminals

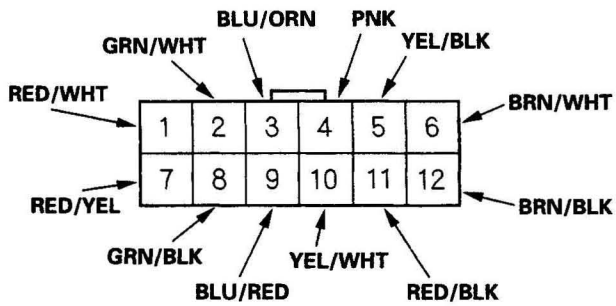
20P CONNECTOR A



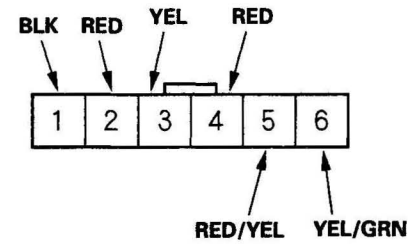
8P CONNECTOR B



12P CONNECTOR C



6P CONNECTOR D



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B1 · B5	BLU · BLU/YEL	Jump B3 terminal to B1 terminal, and B5 terminal to B7 terminal. Reverse the connections to operate the motor in the other direction.	Check slide motor operation: There motor should run.	• Faulty slide motor • An open in the wire
B4 · B8	GRN · GRN/YEL	Jump B3 terminal to B4 terminal, and B8 terminal to B7 terminal. Reverse the connections to operate the motor in the other direction.	Check front up-down motor operation: There motor should run.	• Faulty front up-down motor • An open in the wire
D2 · D5	RED · RED/YEL	Jump B3 terminal to D2 terminal, and D5 terminal to B7 terminal. Reverse the connections to operate the motor in the other direction.	Check rear up-down motor operation: There motor should run.	• Faulty rear up-down motor • An open in the wire
D3 · D6	YEL · YEL/GRN	Jump B3 terminal to D3 terminal, and D6 terminal to B7 terminal. Reverse the connections to operate the motor in the other direction.	Check recline motor operation: There motor should run.	• Faulty recline motor • An open in the wire

BACK

Protected by AR

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A5 . A6	RED/BLK . YEL/BLK	Slide switch in "FORWARD"	Check for continuity between the A5 and A6 terminals: There should be continuity.	• Faulty adjustment switch • An open in the wire
		Slide switch is in the neutral position.	Check for continuity between the A5 and A6 terminals: There should be no continuity.	• Faulty adjustment switch
A5 . A16	RED/BLK . YEL/RED	Slide switch in "BACKWARD"	Check for continuity between the A5 and A16 terminals: There should be continuity.	• Faulty adjustment switch • An open in the wire
		Slide switch is in the neutral position.	Check for continuity between the A5 and A16 terminals: There should be no continuity.	• Faulty adjustment switch
A5 . C1	RED/BLK . RED/WHT	Recline switch in "FORWARD"	Check for continuity between the A5 and C1 terminals: There should be continuity.	• Faulty adjustment switch • An open in the wire
		Recline switch is in the neutral position.	Check for continuity between the A5 and C1 terminals: There should be no continuity.	• Faulty adjustment switch
A5 . C7	RED/BLK . RED/YEL	Recline switch in "BACKWARD"	Check for continuity between the A5 and C7 terminals: There should be continuity.	• Faulty adjustment switch • An open in the wire
		Recline switch is in the neutral position.	Check for continuity between the A5 and C7 terminals: There should be no continuity.	• Faulty adjustment switch
A5 . C8	RED/BLK . GRN/BLK	Front up-down switch in "DOWN"	Check for continuity between the A5 and C8 terminals: There should be continuity.	• Faulty adjustment switch • An open in the wire
		Front up-down switch is in the neutral position.	Check for continuity between the A5 and C8 terminals: There should be no continuity.	• Faulty adjustment switch
A5 . C2	RED/BLK . GRN/WHT	Front up-down switch in "UP"	Check for continuity between the A5 and C2 terminals: There should be continuity.	• Faulty adjustment switch • An open in the wire
		Recline switch is in the neutral position.	Check for continuity between the A5 and C2 terminals: There should be no continuity.	• Faulty adjustment switch
A5 . C3	RED/BLK . BLU/ORN	Rear up-down switch in "UP"	Check for continuity between the A5 and C3 terminals: There should be continuity.	• Faulty adjustment switch • An open in the wire
		Rear up-down switch is in the neutral position.	Check for continuity between the A5 and C3 terminals: There should be no continuity.	• Faulty adjustment switch
A5 . C9	RED/BLK . BLU/RED	Rear up-down switch in "DOWN"	Check for continuity between the A5 and C9 terminals: There should be continuity.	• Faulty adjustment switch • An open in the wire
		Rear up-down switch is in the neutral position.	Check for continuity between the A5 and C9 terminals: There should be no continuity.	• Faulty adjustment switch

(cont'd)

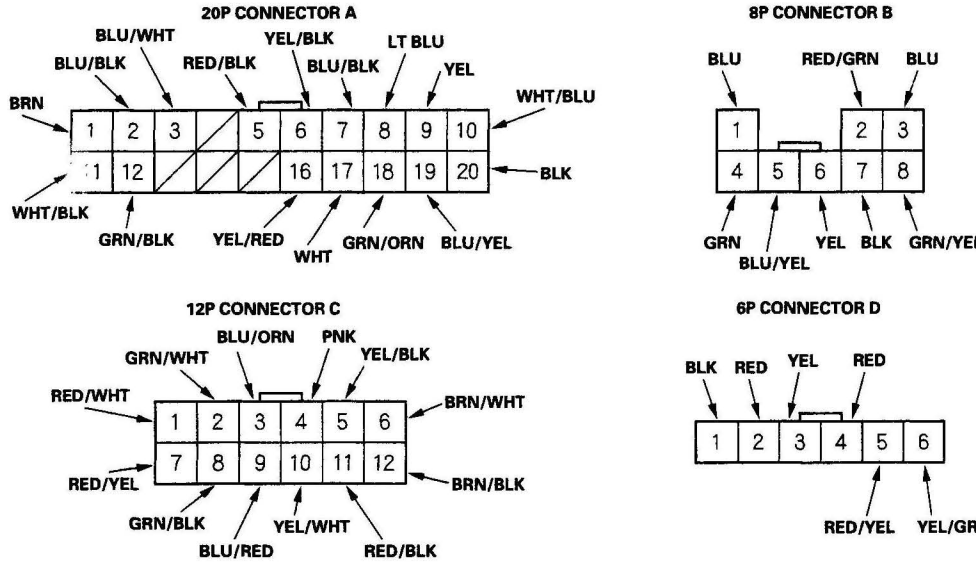
BACK

Protected by AR

Power Seat Control Unit Input Test (cont'd)

5. Reconnect the connectors to the driver's power seat control unit, and make these input tests at the connectors.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the control unit must be faulty; replace it.

NOTE: All connector views are from wire side of female terminals.



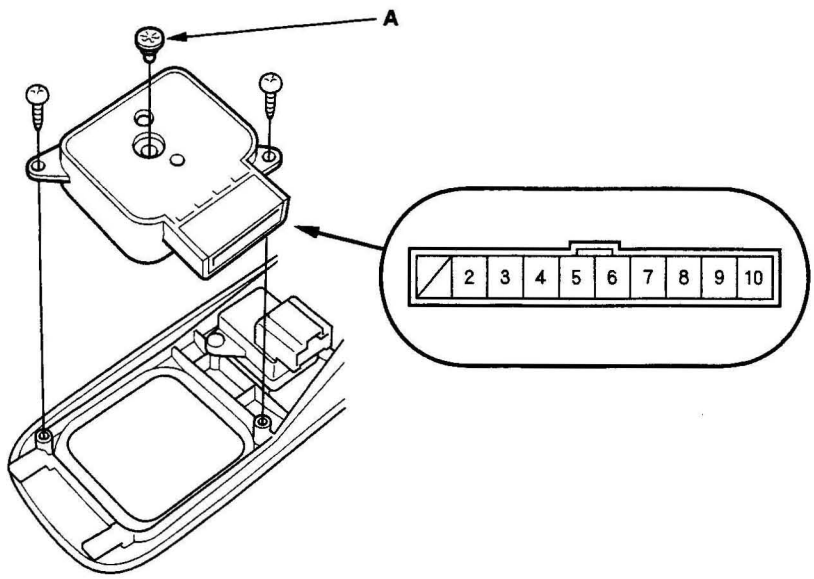
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A18	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire • A short to ground
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	
A2	BLU/BLK	While slide motor running	Check for voltage to ground: There should be 0 V to about 5 V alternately.	• Faulty slide position sensor • An open in the wire • A short to ground
A12	GRN/BLK	While front up-down motor running	Check for voltage to ground: There should be 0 V to about 5 V alternately.	• Faulty front up-down position sensor • An open in the wire • A short to ground
C5	YEL/BLK	While recline motor running	Check for voltage to ground: There should be 0 V to about 5 V alternately.	• Faulty recline position sensor • An open in the wire • A short to ground
C11	RED/BLK	While rear up-down motor running	Check for voltage to ground: There should be 0 V to about 5 V alternately.	• Faulty rear up-down position sensor • An open in the wire • A short to ground
A1 . A11	BRN . WHT/BLK	Ignition switch ON (II)	Measure voltage between A1 and A11: There should be 5 V.	• Faulty slide position sensor • Faulty front height position sensor • Faulty driver's power seat control unit • A short to ground
C6 . C12	BRN/WHT . BRN/BLK	Ignition switch ON (II)	Measure voltage between C6 and C12: There should be 5 V.	• Faulty recline position sensor • Faulty rear height position sensor • Faulty power seat control unit • A short to ground

BACK

Protected by AR

Driving Position Memory Switch Test/Replacement

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 10P connector from the memory switch (A).



3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal		2		3	4	7	8	9	10	5		6
MEMO button	OFF											
	ON					○			○			
Position 1 button	OFF											
	ON							○	○	○	○	○
Position 2 button	OFF											
	ON						○		○			
Indicator 1		○	◁▷		○							
Indicator 2		○	◁▷	○								

4. If the continuity is not as specified, replace the bulb (A) or the switch.

Protected by AR

Power Seat Position Sensor Troubleshooting

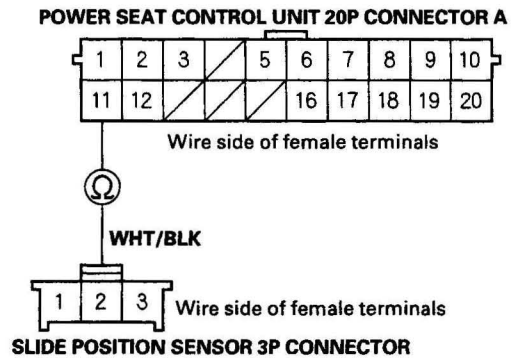
Slide Position Sensor:

1. Remove the driver's power seat (see page 20-78).

   NOTE: Be careful to not scratch the interior trim.

2. Disconnect the 3P connector from the slide position sensor and the 20P connector from the power seat control unit.

3. Check for continuity between the No. 2 terminal of the slide position sensor and A11 terminal of the power seat control unit.

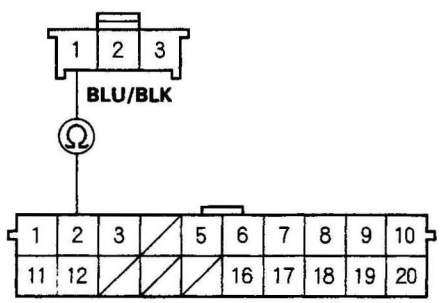


Is there continuity?

YES – Go to step 4.

NO – Repair open in the WHT/BLK wire. ■

4. Check for continuity between the No. 1 terminal of the slide position sensor and A2 terminal of the power seat control unit.



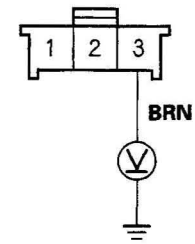
Is there continuity?

YES – Go to step 5.

NO – Repair the open in the BLU/BLK wire. ■

5. Reconnect the 3P and 20P connectors.

6. Check for voltage between the No. 3 terminal of the slide position sensor and body ground.

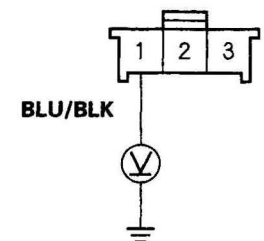


Is there about 5 V?

YES – Go to step 7.

NO – Repair the open or the short in the BRN wire. ■

7. Check for voltage pulse between the No. 1 terminal of the slide position sensor and body ground when the slide motor moves forward or backward.



Does voltage pulse from 0 to about 5 V alternately?

YES – Replace the power seat control unit. ■

NO – Check for a short in the wire. If the wire is OK, faulty slide position sensor; replace the slide motor assembly. ■

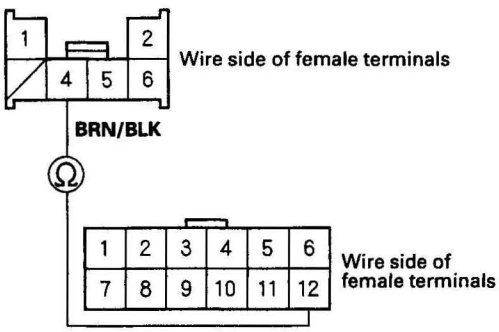
BACK

Protected by AR

Recline Position Sensor:

1. Remove the driver's power seat (see page 20-78).
2. Disconnect the 6P connector from the recline motor/position sensor and the 12P connector from the power seat control unit.
3. Check for continuity between the No. 4 terminal of the recline position sensor and C12 terminal of the power seat control unit.

RECLINE POSITION SENSOR 6P CONNECTOR



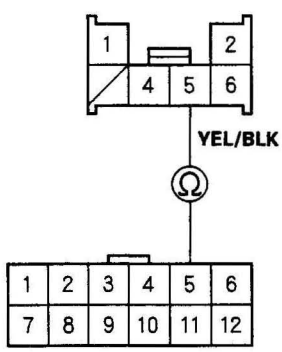
POWER SEAT CONTROL UNIT 12P CONNECTOR C

Is there continuity?

YES – Go to step 4.

NO – Repair open in the BRN/BLK wire. ■

4. Check for continuity between the No. 5 terminal of the recline position sensor and C5 terminal of the power seat control unit.

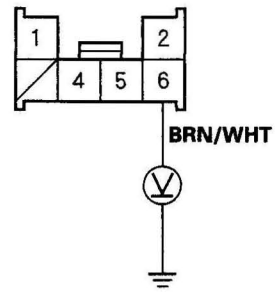


Is there continuity?

YES – Go to step 5.

NO – Repair open in the YEL/BLK wire. ■

5. Reconnect the 6P and 12P connectors.
6. Check for voltage between the No. 6 terminal of the recline position sensor and body ground.

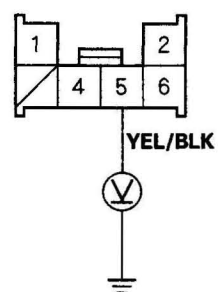


Is there about 5 V?

YES – Go to step 7.

NO – Repair the open or the short to ground in the BRN/WHT wire. ■

7. Check for voltage pulse between the No. 5 terminal of the recline position sensor and body ground when the recline switch moves forward or backward.



Does voltage pulse from 0 to about 5 V alternately?

YES – Replace the power seat control unit. ■

NO – Check for a short in the wire. If the wire is OK, faulty recline position sensor; replace the recline motor assembly. ■

(cont'd)

Protected by AR

Power Seat Position Sensor Troubleshooting (cont'd)

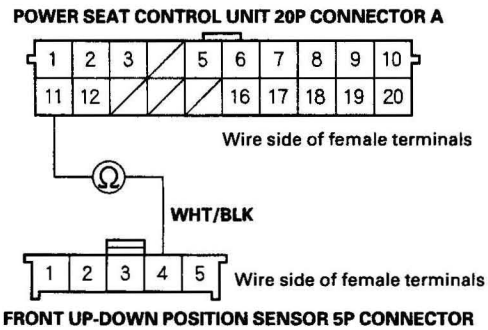
Front Up-Down Position Sensor:

1. Remove the driver's power seat (see page 20-78).

   NOTE: Be careful to not scratch the interior trim.

2. Disconnect the 5P connector from the front up-down position sensor and the 20P connector from the power seat control unit.

3. Check for continuity between the No. 4 terminal of the front up-down position sensor and A11 terminal of the power seat control unit.

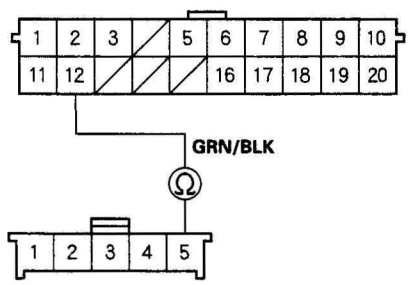


Is there continuity?

YES – Go to step 4.

NO – Repair open in the WHT/BLK wire. ■

4. Check for continuity between the No. 5 terminal of the front up-down position sensor and A12 terminal of the power seat control unit.



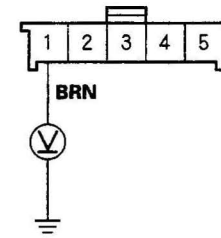
Is there continuity?

YES – Go to step 5.

NO – Repair open in the GRN/BLK wire. ■

5. Reconnect the 5P and 20P connectors.

6. Check for voltage between the No. 1 terminal of the front up-down position sensor and body ground.

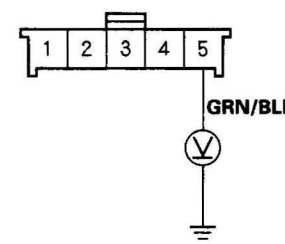


Is there about 5 V?

YES – Go to step 7.

NO – Repair the open or a short to ground in the BRN wire. ■

7. Check for voltage pulse between the No. 5 terminal of the front up-down position sensor and body ground when the front up-down switch moves up and down.



Does voltage pulse from 0 to about 5 V alternately?

YES – Replace the power seat control unit. ■

NO – Check for a short in the wire. If the wire is OK, faulty front up-down position sensor; replace the front up-down motor assembly. ■

BACK

Protected by AR

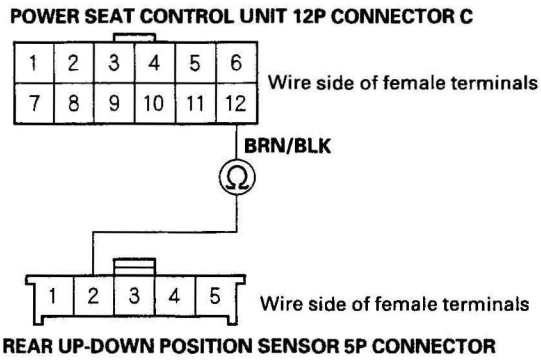
Rear Up-Down Position Sensor:

1. Remove the driver's power seat (see page 20-78).

   NOTE: Be careful to not scratch the interior trim.

2. Disconnect the 5P connector from the rear up-down position sensor and the 12P connector from the power seat control unit.

3. Check for continuity between the No. 2 terminal of the rear up-down position sensor and C12 terminal of the power seat control unit.

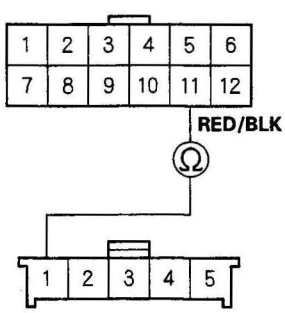


Is there continuity?

YES – Go to step 4.

NO – Repair open in the BRN/BLK wire. ■

4. Check for continuity between the No. 1 terminal of the rear up-down position sensor and C11 terminal of the power seat control unit.



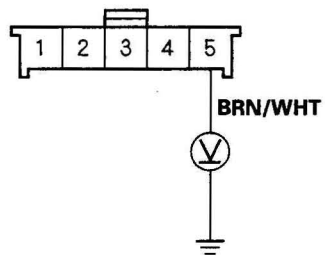
Is there continuity?

YES – Go to step 5.

NO – Repair open in the RED/BLK wire. ■

5. Reconnect the 5P and 12P connectors.

6. Check for voltage between the No. 5 terminal of the rear up-down position sensor and body ground.

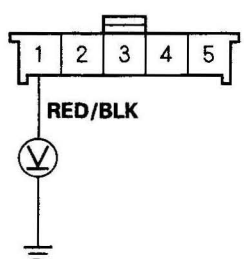


Is there about 5 V?

YES – Go to step 7.

NO – Repair the open or the short to ground in the BRN/WHT wire. ■

7. Check for voltage pulse between the No. 1 terminal of the rear up-down position sensor and body ground when the rear up-down switch moves up and down.



Does voltage pulse from 0 to about 5 V alternately?

YES – Replace the power seat control unit. ■

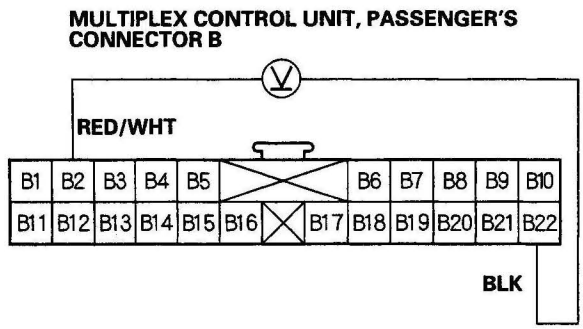
NO – Check for a short in the wire. If the wire is OK, faulty rear up-down position sensor; replace the rear up-down motor assembly. ■

Protected by AR

Power Mirror Position Sensor Troubleshooting

NOTE: Before troubleshooting, check the No. 4 (7.5A) fuse in the driver's under-dash fuse/relay box and test the power mirrors.

1. Turn the ignition switch ON (II).
2. Check for voltage between the B2 and B22 terminals of the passenger's multiplex control unit with the power mirror switch pressed UP.



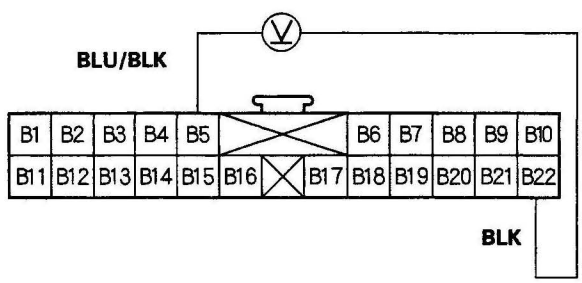
Wire side of female terminals

Is there battery voltage?

YES – Go to step 3.

NO – Repair open in the RED/WHT or BLK wire. ■

3. Move the selector switch to Right.
4. Check for voltage between the B5 and B22 terminals with the power mirror switch pressed to the Right.

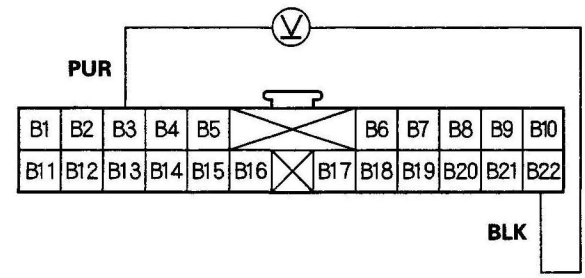


Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the BLU/BLK wire. ■

5. Check for voltage between the B3 and B22 terminals with the power mirror switch pressed to the Left or Down.

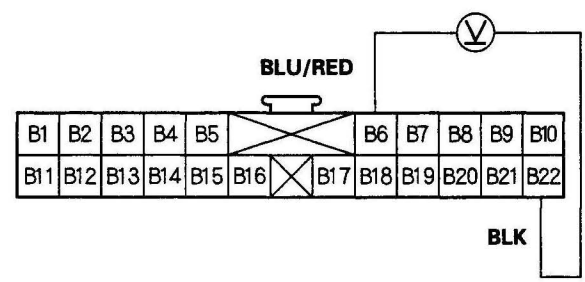


Is there battery voltage?

YES – Go to step 6.

NO – Repair open in the PUR wire. ■

6. Move the selector switch to Left.
7. Check for voltage between the B6 and B22 terminals with the power mirror switch pressed to the Right or Down.



Is there battery voltage?

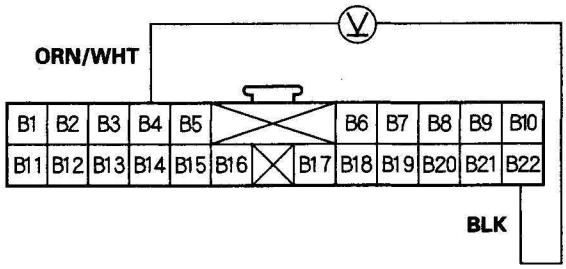
YES – Go to step 8.

NO – Repair open in the BLU/RED wire. ■

BACK

Protected by AR

8. Check for voltage between the B4 and B22 terminals with the power mirror switch pressed to the Left or Down.



Is there battery voltage?

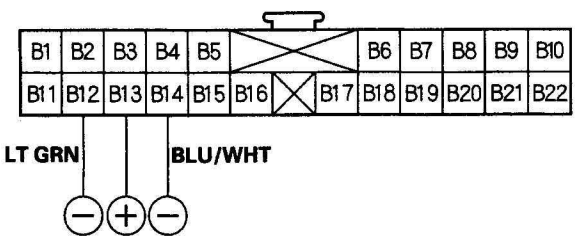
YES – Go to step 9.

NO – Repair open in the ORN/WHT wire.■

9. Turn the ignition switch OFF.

10. Disconnect the passenger's multiplex control unit 22P connector B.

11. Apply battery power to the B13 terminal and ground the B12 [or B14] terminal.

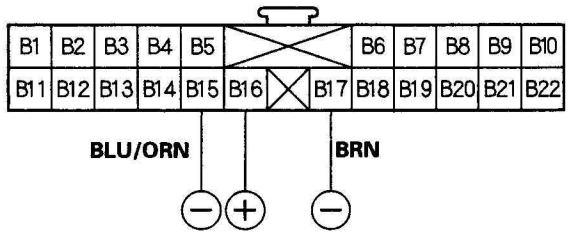


Does right mirror swing left [or tilt down] ?

YES – Go to step 12.

NO – Check the power mirror actuator (see page 22-239). If the mirror is OK, repair the open in the YEL/WHT or LT GRN [BLU/WHT] wires.■

12. Apply battery power to the B16 terminal and ground the B15 [or B17] terminal.



Does left mirror swing left [or tilt down] ?

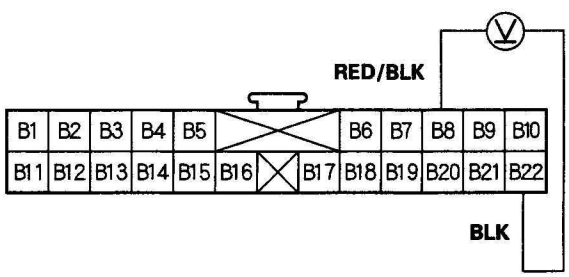
YES – Go to step 13.

NO – Check the power mirror actuator (see page 22-239). If the mirror is OK, repair the open in the BLU/GRN or BLU/ORN [BRN] wires.■

13. Reconnect the 22P connector B to the passenger's multiplex control unit.

14. Turn the ignition switch ON (II).

15. Check for voltage between the B8 and B22 terminals.



Is there about 5 V?

YES – Go to step 16.

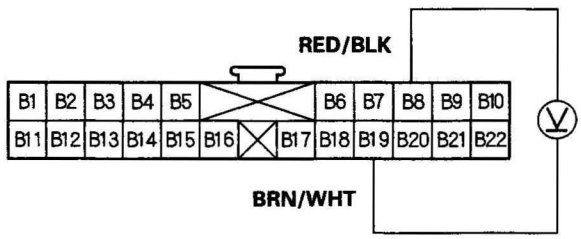
NO – Repair open or short in the RED/BLK wire. If the wire is OK, replace the passenger's multiplex control unit.■

(cont'd)

Protected by AR

Power Mirror Position Sensor Troubleshooting (cont'd)

16. Check for voltage between the B8 and B19 terminals.

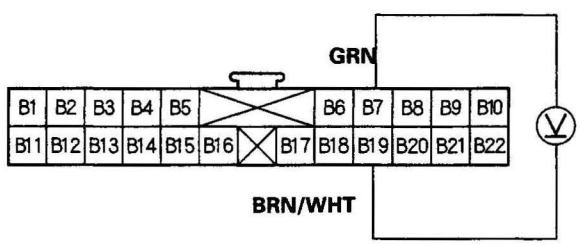


Is there about 5 V?

YES – Go to step 17.

NO – Repair open or short in the BRN/WHT wire. If the wire is OK, faulty power mirror position sensor, replace the power mirror actuator. ■

17. Check for voltage between the B7 and B19 terminals while moving the mirror from right to left.

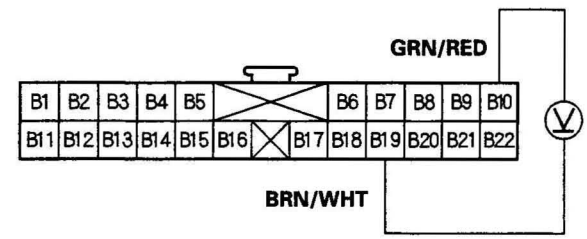


Does the voltage change from about 3 V to 1 V?

YES – Go to step 18.

NO – Repair open or short in the GRN wire. If the wire is OK, faulty right power mirror position sensor, replace the right power mirror actuator. ■

18. Check for voltage between the B10 and B19 terminals while moving the mirror from up to down.

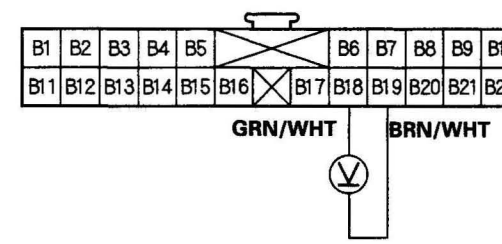


Does the voltage change from about 1 V to 3 V?

YES – Go to step 19.

NO – Repair open or short in the GRN/RED wire. If the wire is OK, faulty right power mirror position sensor, replace the right power mirror actuator. ■

19. Check for voltage between the B18 and B19 terminals while moving the mirror from left to right.



Does the voltage change from about 3 V to 1 V?

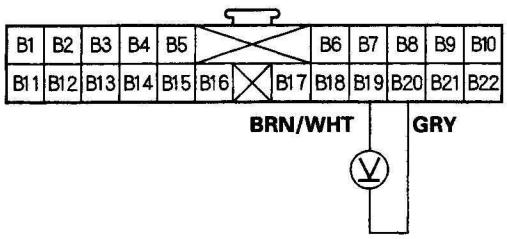
YES – Go to step 20.

NO – Repair open or short in the GRN/WHT wire. If the wire is OK, faulty left power mirror position sensor, replace the left power mirror actuator. ■

BACK

Protected by AR

20. Check for voltage between the B20 and B19 terminals while moving the mirror from up to down.



Does the voltage change from about 1 V to 3 V?

YES – Substitute a known good passenger's multiplex control unit, and recheck. If the systems now work OK, replace the original passenger's unit. ■

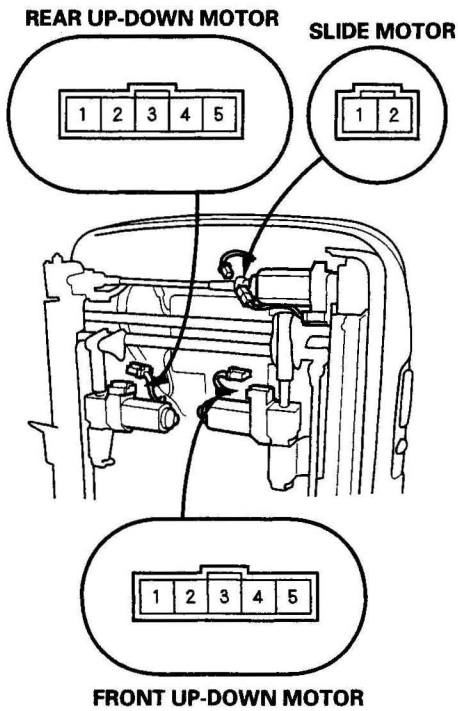
NO – Repair open or short in the GRY wire. If the wire is OK, faulty left power mirror position sensor, replace the left power mirror actuator. ■

BACK

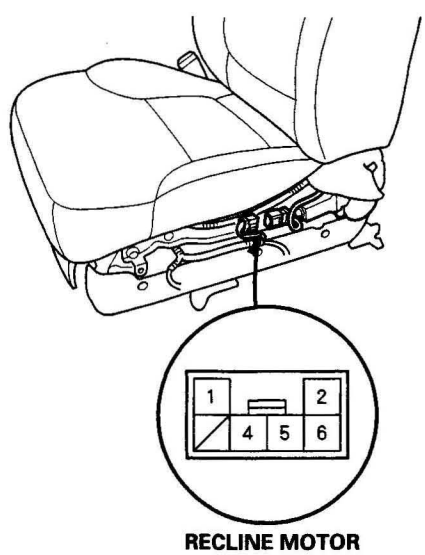
Protected by AR

Driver's Power Seat Motor Test

1. Remove the driver's seat (see page 20-78).
2. Disconnect the connector from each power seat connector.



FRONT UP-DOWN MOTOR



RECLINE MOTOR

3. Test the motor by connecting power and ground according to the table. When the motor stops running, disconnect battery power immediately.

Position		Terminal 1	Terminal 2
SLIDE MOTOR	FORWARD	⊕	⊖
	BACKWARD	⊖	⊕
RECLINE MOTOR	FORWARD	⊖	⊕
	BACKWARD	⊕	⊖

Position		Terminal 2	Terminal 3
FRONT UP-DOWN MOTOR	UP	⊕	⊖
	DOWN	⊖	⊕

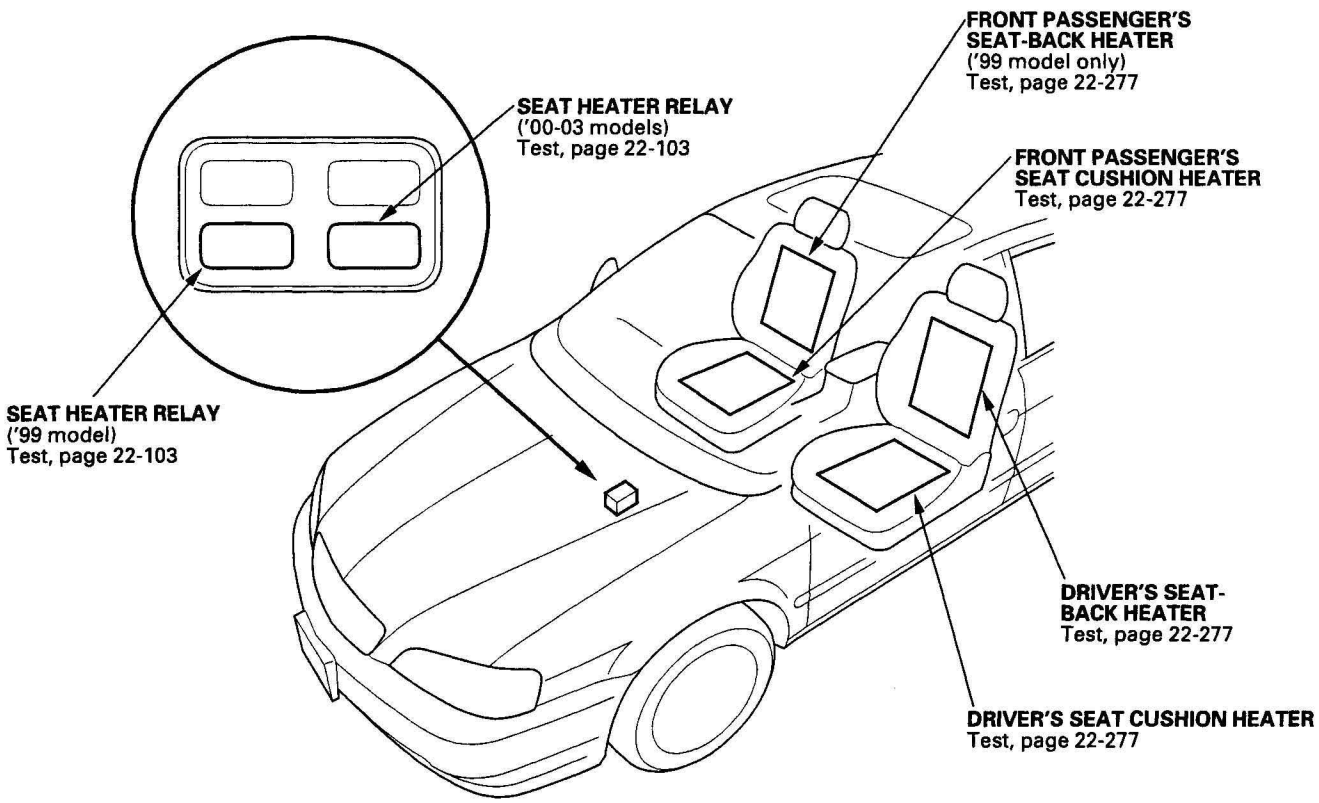
Position		Terminal 3	Terminal 4
REAR UP-DOWN MOTOR	UP	⊕	⊖
	DOWN	⊖	⊕

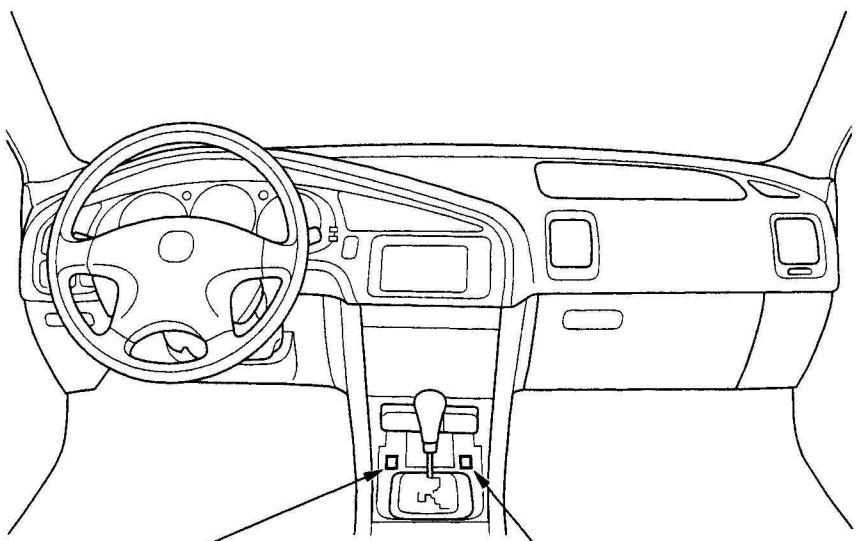
4. If the motor does not run or fails to run smoothly, replace it (see page 20-89).

BACK

Protected by AR

Component Location Index

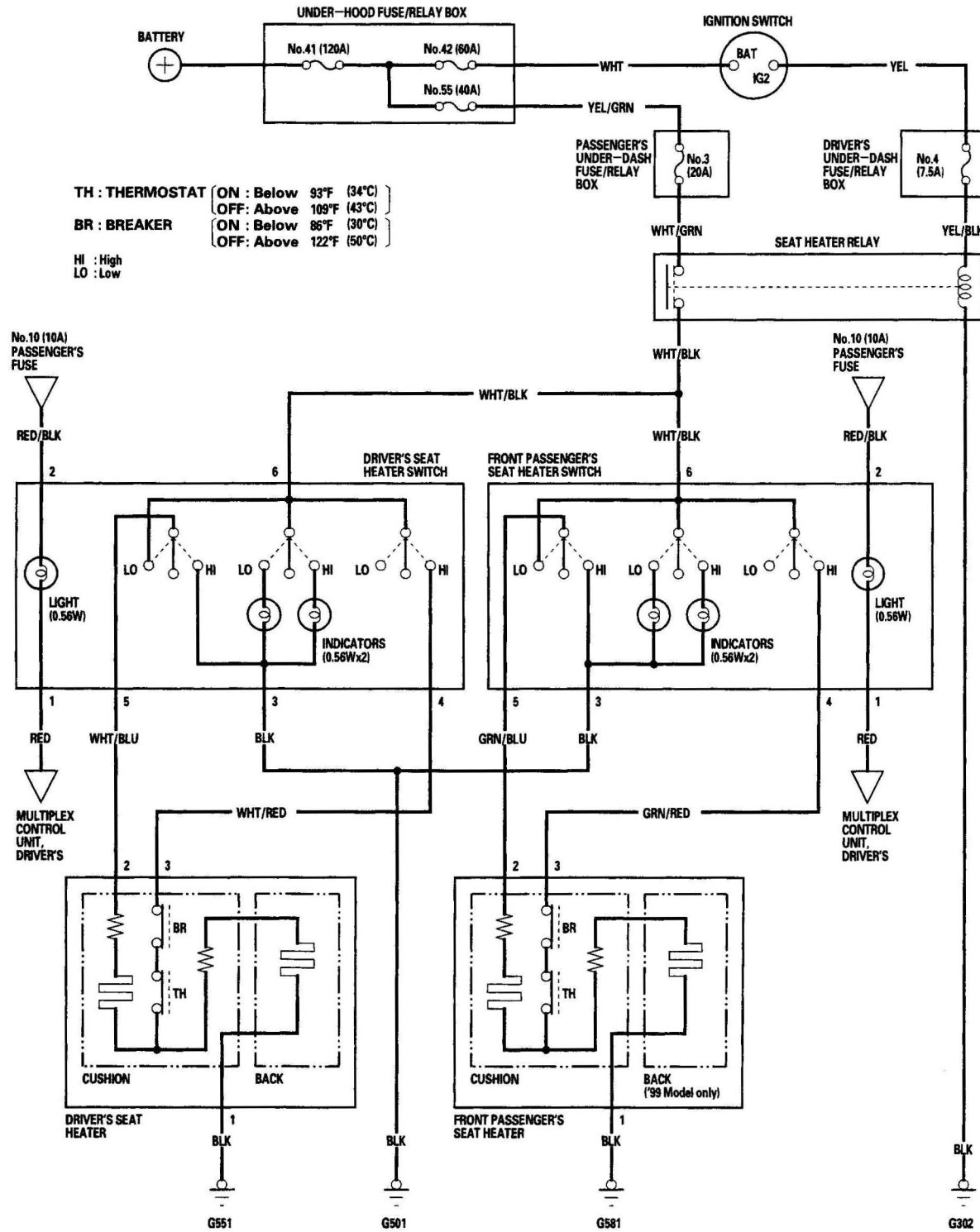




Protected by AR

Seat Heaters

Circuit Diagram

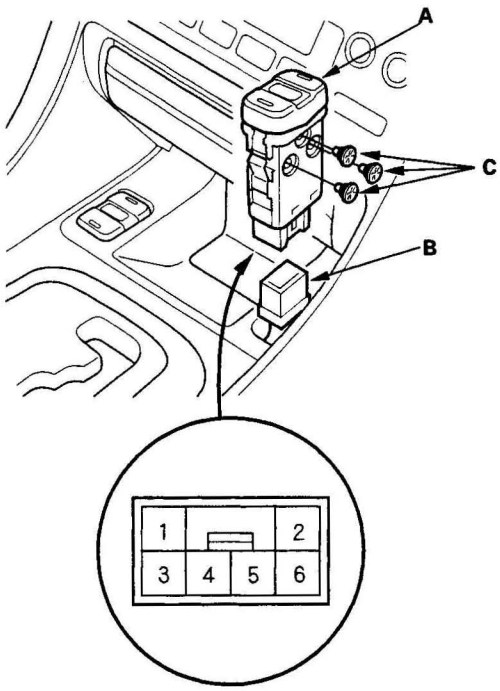


BACK

Protected by AR

Switch Test

1. Remove the console panel (see page 20-63).
2. Push out the seat heater switch (A) from behind the center console panel.



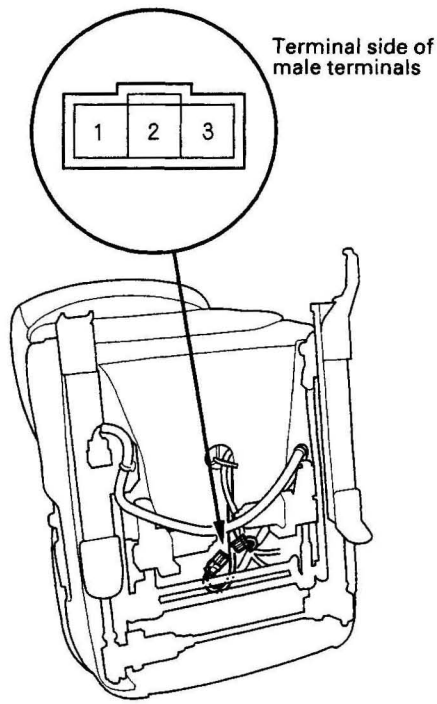
3. Disconnect the 6P connector (B) from the switch.
4. Check for continuity between the terminal in each switch position according to the table.

Position		Terminal 1		2	3		6	4	5
ON	HIGH	○	○	○	○	○	○	○	○
	LOW	○	○	○	○	○	○		○
OFF		○	○	○					

5. If the continuity is not as specified, replace the switch.
6. If necessary, check the illumination bulbs (C).

Seat Heater Test

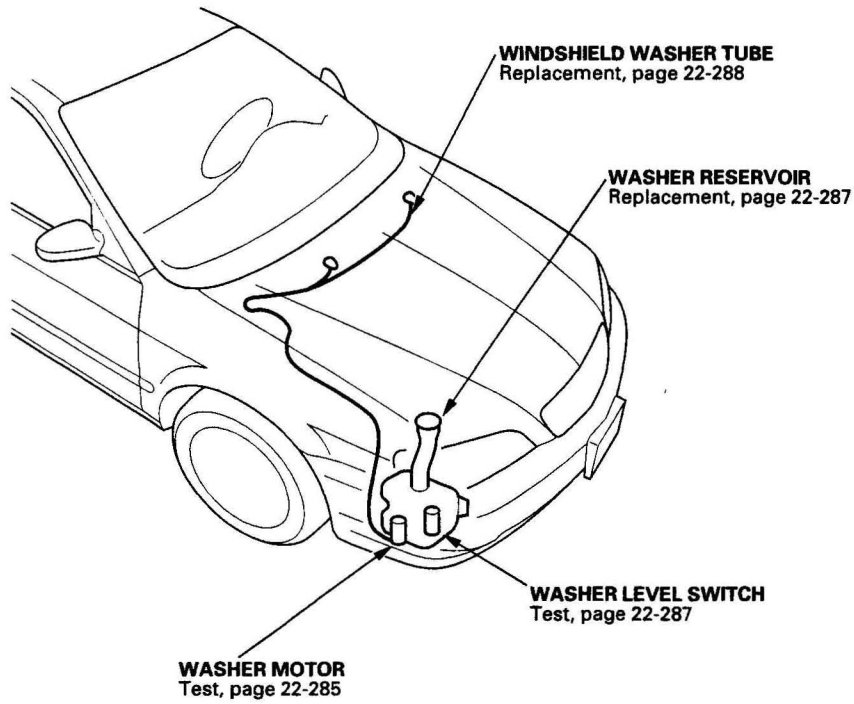
1. Carefully remove the front seat (see page 20-78).
2. Check for continuity between the No. 1 and No. 2 terminals, and the No. 1 and No. 3 terminals. There should be continuity.

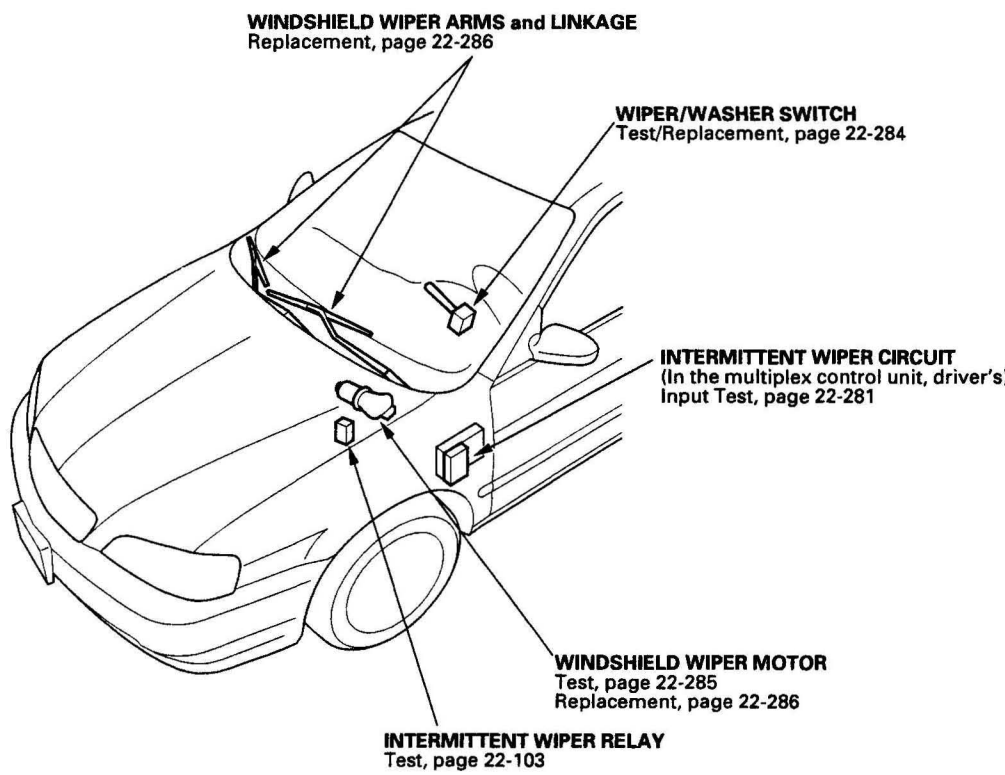


3. If there is no continuity, replace the seat heater.

Protected by AR

Component Location Index

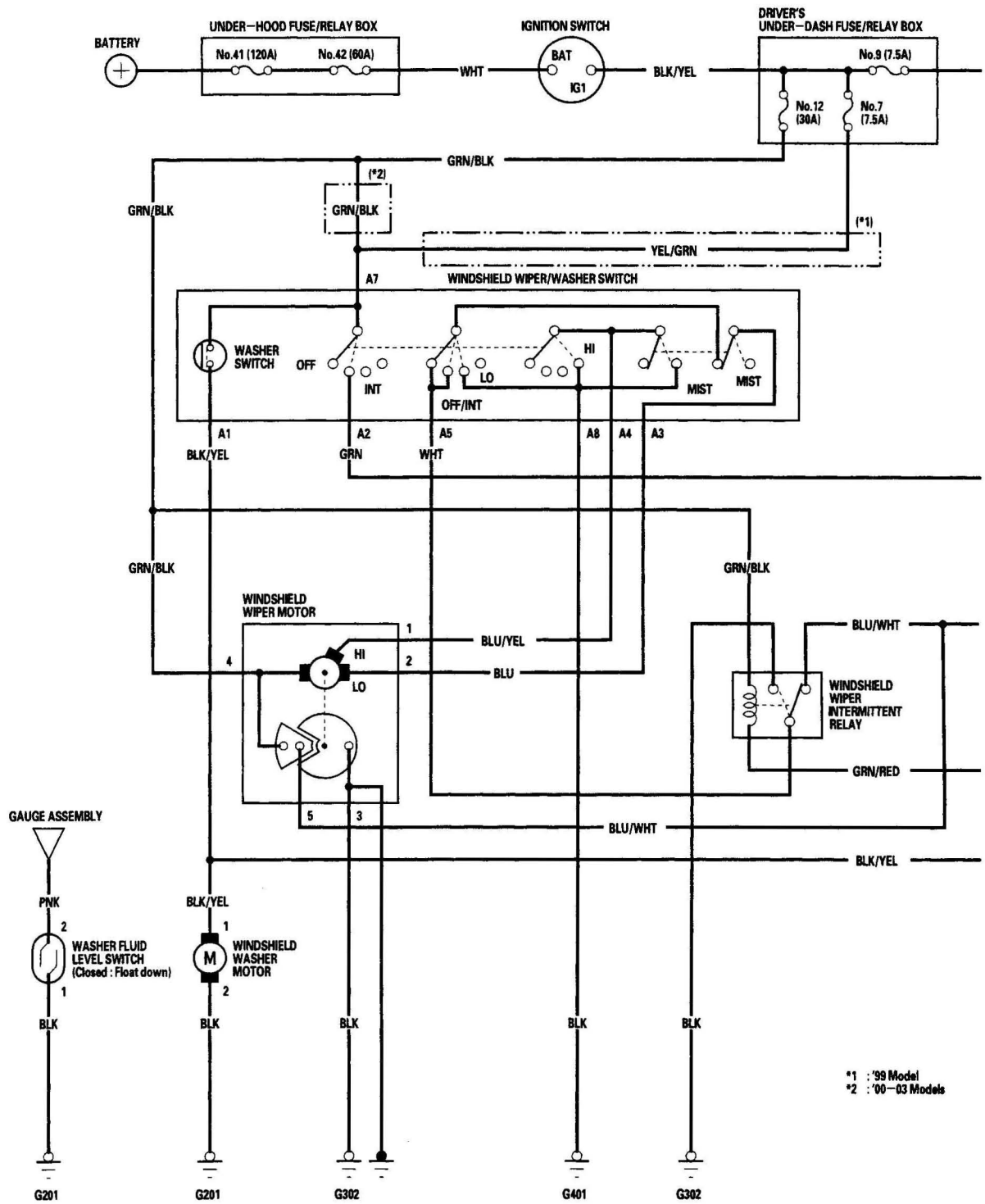




BACK

Protected by AR

Circuit Diagram

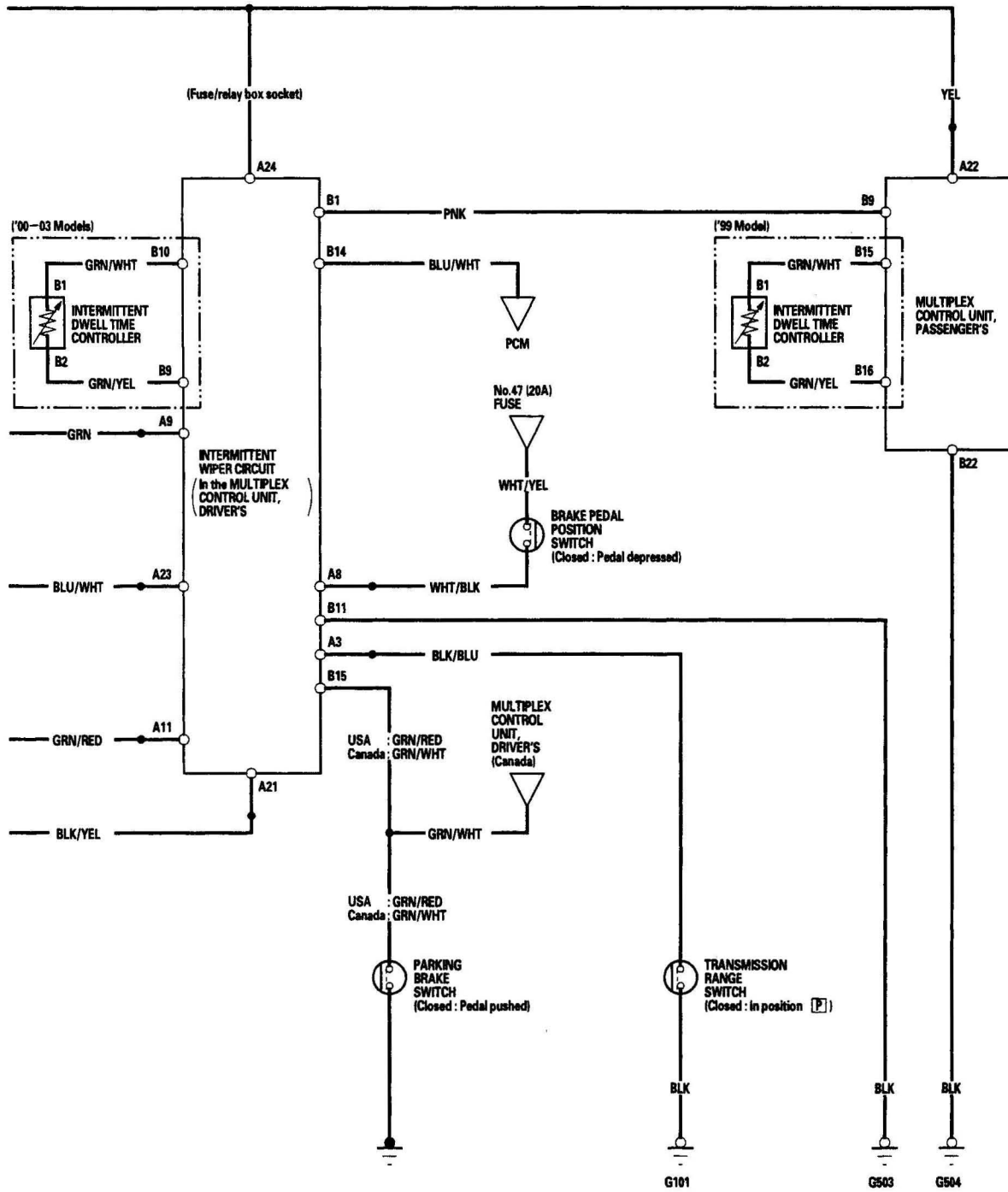


(cont'd)

BACK

Protected by AR

Circuit Diagram (cont'd)



BACK

Protected by AR

Control Unit Input Test

1. Before testing the wiper/washer control functions, troubleshoot the multiplex control system (see page 22-298).

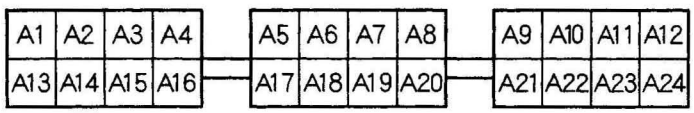
Multiplex Control Unit, Driver's:

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box, and disconnect its connector.

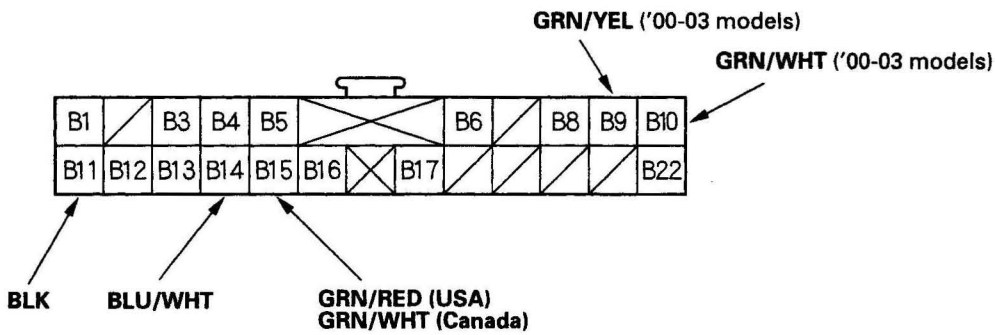
3. Inspect all connector and socket terminals to be sure they are making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

FUSE/RELAY BOX SOCKET



MULTIPLEX CONTROL UNIT, DRIVER'S CONNECTOR B



Wire side of female terminals

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

4. With the driver's multiplex control unit still disconnected, make these input tests at the connector and driver's under-dash fuse/relay box sockets.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A9	Fuse/relay box socket	Ignition switch ON (II) and wiper switch at INT	Check for voltage to ground: There should be battery voltage.	• Blown No. 7 (7.5 A) [No. 12 (30 A) fuse] fuse in the driver's under-dash fuse/relay box • Faulty wiper switch • An open in the wire
A8		Brake pedal pushed	Check for voltage to ground: There should be battery voltage.	• Blown No. 47 (20 A) fuse in the under-hood fuse/relay box • An open in the wire
A11		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 12 (30 A) fuse in the driver's under-dash fuse/relay box • Faulty intermittent wiper relay • An open in the wire
A21		Ignition switch ON (II) and washer switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 7 (7.5 A) [No. 12 (30 A) fuse] fuse in the driver's under-dash fuse/relay box • Faulty washer switch • An open in the wire
A23		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 12 (30 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A3		Shift lever in P	Check for continuity to ground: There should be continuity to ground	• Poor ground (G101) • Faulty A/T gear position switch • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty driver's fuse/relay box
B9*1	GRN/YEL	Intermittent dwell time control ring turned	Check for resistance between the terminals: It should vary from about 0 to 30 kΩ as the ring is turned.	• Faulty intermittent dwell time controller • An open in the wire
B10*1	GRN/WHT			
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • An open in the wire
B14	BLU/WHT	Under all conditions	Check for continuity between the B14 terminal and No. 9 terminal of the PCM 32P connector A: There should be continuity.	• An open in the wire
B15	GRN/RED (USA) GRN/WHT (Canada)	Parking brake pedal pushed	Check for continuity to ground: There should be continuity.	• Faulty parking brake switch • An open in the wire

[ ] : '99 model
* 1: '00-03 models

BACK

Protected by AR

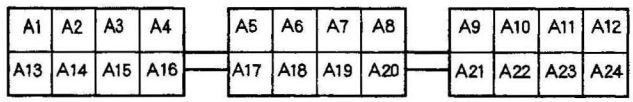
Multiplex Control Unit, Passenger's:

5. Remove the passenger's under-dash fuse/relay box (see page 22-101).

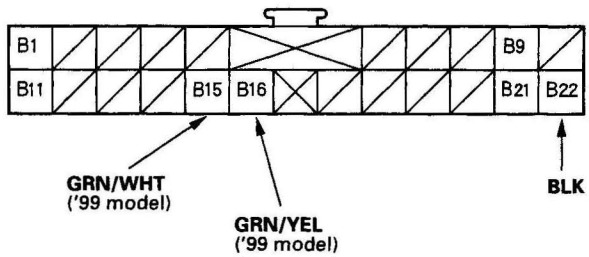
6. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

7. Inspect all connector and socket terminals to be sure they are making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

FUSE/RELAY BOX SOCKET



MULTIPLEX CONTROL UNIT, PASSENGER'S CONNECTOR



Wire side of female terminals

8. With the passenger's multiplex control unit still disconnected, make these input tests at the connector and the passenger's under-dash fuse/relay box sockets.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the control unit must be faulty; replace it.

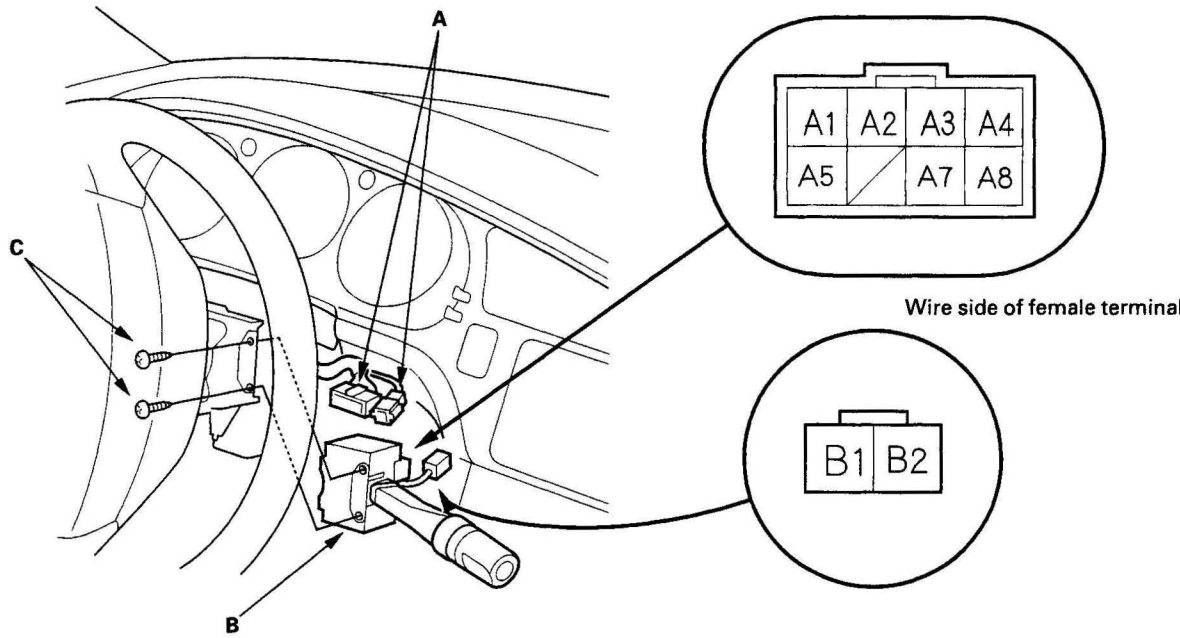
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B22	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G504) • An open in the wire
A22	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
B16 * 1	GRN/YEL	Intermittent dwell time control ring turned	Check for resistance between the terminals: It should vary from about 0 to 30 kΩ as the ring is turned.	• Faulty intermittent dwell time controller • An open in the wire
B15 * 1	GRN/WHT			

* 1: '99 model

Protected by AR

Wiper/Washer Switch Test/Replacement

1. Remove the dashboard lower cover (see page 20-65).
2. Remove the steering column covers (see page 17-27).
3. Disconnect the connectors (A) from the wiper/washer switch (B), then remove the two screws (C) and the switch.



4. Check for continuity between the terminals in each switch position according to the table. If the switch fails any continuity check, replace the switch.

Terminal / Position	A1	A2	A3	A4	A5	A7	A8	B1		B2
OFF			○		○					
INT		○				○				
			○		○					
LO			○				○			
HI				○			○			
Mist switch ON				○			○			
Washer switch ON	○					○				
Intermittent dwell time controller turned								○	0—30 kΩ	○

5. If the continuity is not as specified, replace the switch.

BACK

Protected by AR

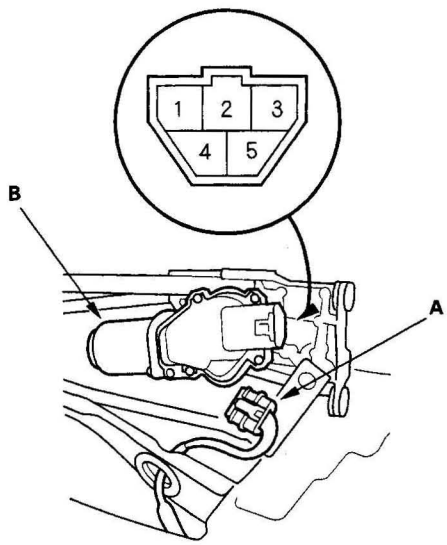
Wiper Motor Test

1. Open the hood, and remove the cap nuts and the wiper arms.

   NOTE: Carefully remove the wiper arms, so that they do not touch the hood.

2. Remove the windshield wiper arms (see page 22-286).

3. Disconnect the 5P connector(A) from the wiper motor(B).



4. Test the motor by connecting battery power and ground according to the table.
   If the motor does not run or fails to run smoothly, replace it.

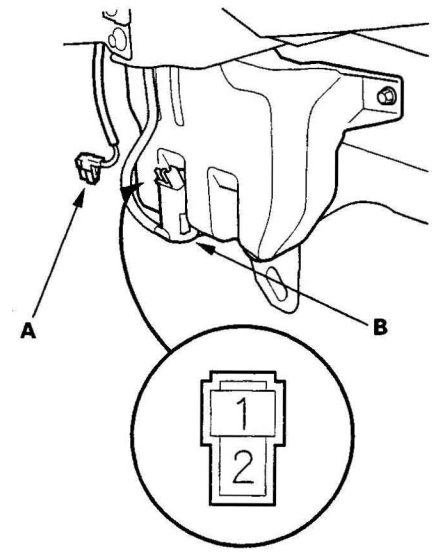
Terminal / Position	1	2	4
LOW SPEED		⊖	⊕
HIGH SPEED	⊖		⊕

5. Connect an analog voltmeter between the No. 5 (+) and No. 3 (−) terminals, and run the motor at low or high speed. The voltmeter should indicate 0 V and 4 V or less alternately.

Washer Motor Test

1. Remove the right inner fender (see page 20-129).

2. Disconnect the 2P connector (A) from the washer motor (B).



3. Test the washer motor by connecting battery power and ground according to the table.

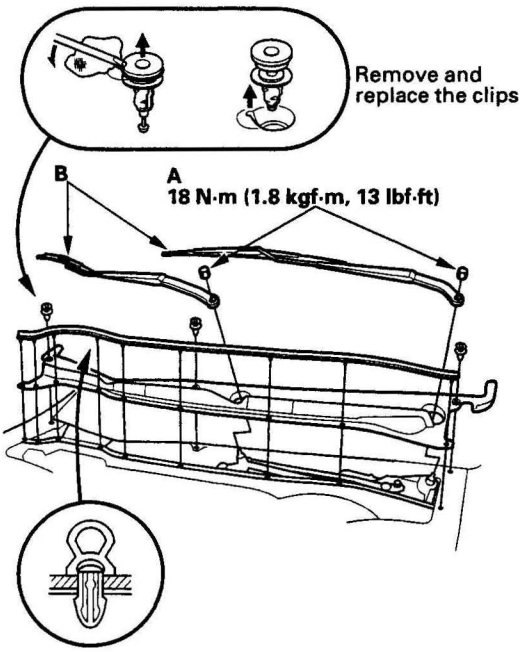
   - If the motor fails to run smoothly, replace it.
   - If the motor runs smoothly, but little or no washer fluid is pumped, check for a disconnected or blocked washer hose, or a clogged pump outlet in the motor.

Terminal / Battery	1	2
Connected	⊕	⊖

Protected by AR

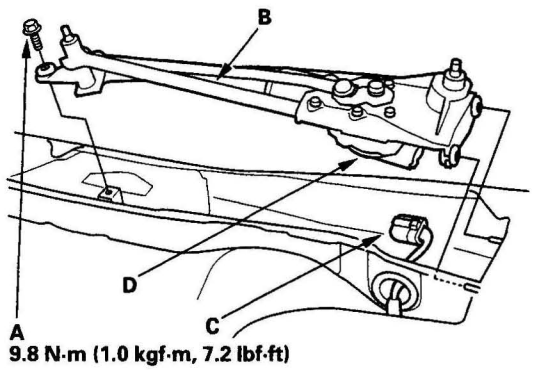
Wiper Motor Replacement

1. Remove the nuts (A) and remove the windshield wiper arms (B).



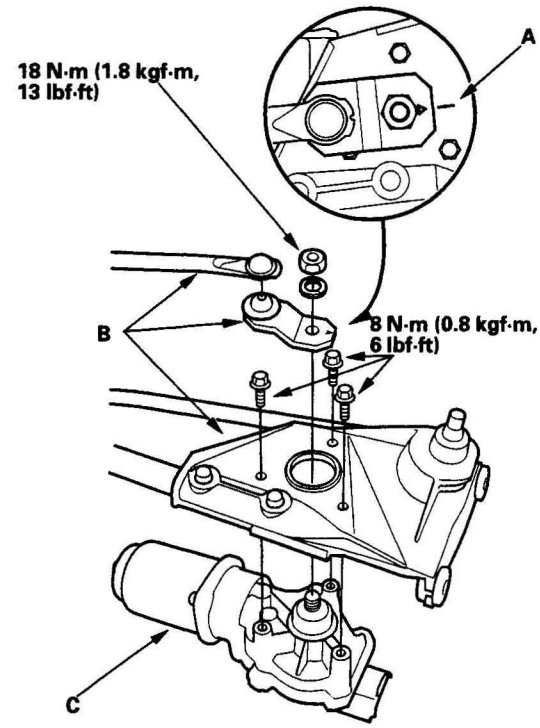
2. Remove the hood seal and cowl cover.

3. Remove the bolt (A) and windshield wiper linkage assembly (B).



4. Disconnect the 5P connector (C) from the wiper motor (D).

5. Scribe a line (A) across the link and windshield wiper linkage to show the original adjustment. Separate the windshield wiper linkage (B) from the wiper motor (C).



6. Install in the reverse order of removal, and note these items:

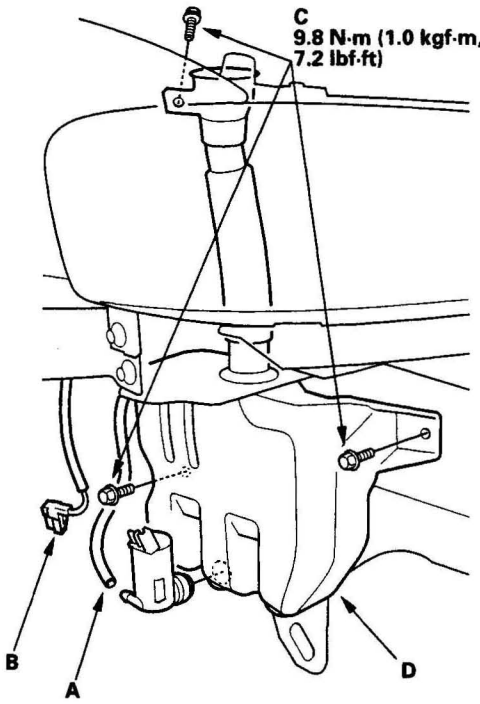
- Grease the moving parts.
- Before reinstalling the wiper arms, turn the wiper switch ON, then OFF to return the wiper shafts to the park position.
- If necessary, replace any damaged clips.
- Check the wiper motor operation.

BACK

Protected by AR

Washer Reservoir Replacement

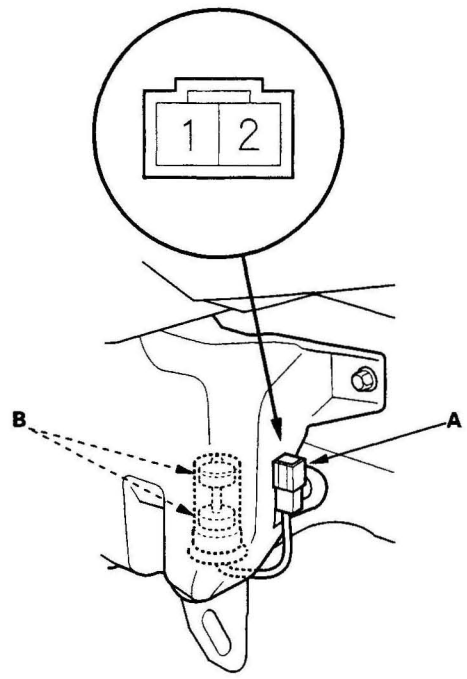
1. Pull away the right inner fender (see page 20-129).
2. Disconnect the washer tube (A) and washer motor connector (B).



3. Remove the three bolts (C) and the washer reservoir (D).
4. Install in the reverse order of removal. Check the washer motor operation.

Washer Fluid Level Switch Test (Canada)

1. Remove the right inner fender (see page 20-129).
2. Disconnect the switch 2P connector (A).



3. Remove the washer level switch from the reservoir.

   NOTE: Fluid may flow out of the opening.

4. Check for continuity between the terminals in each float (B) position according to the table.

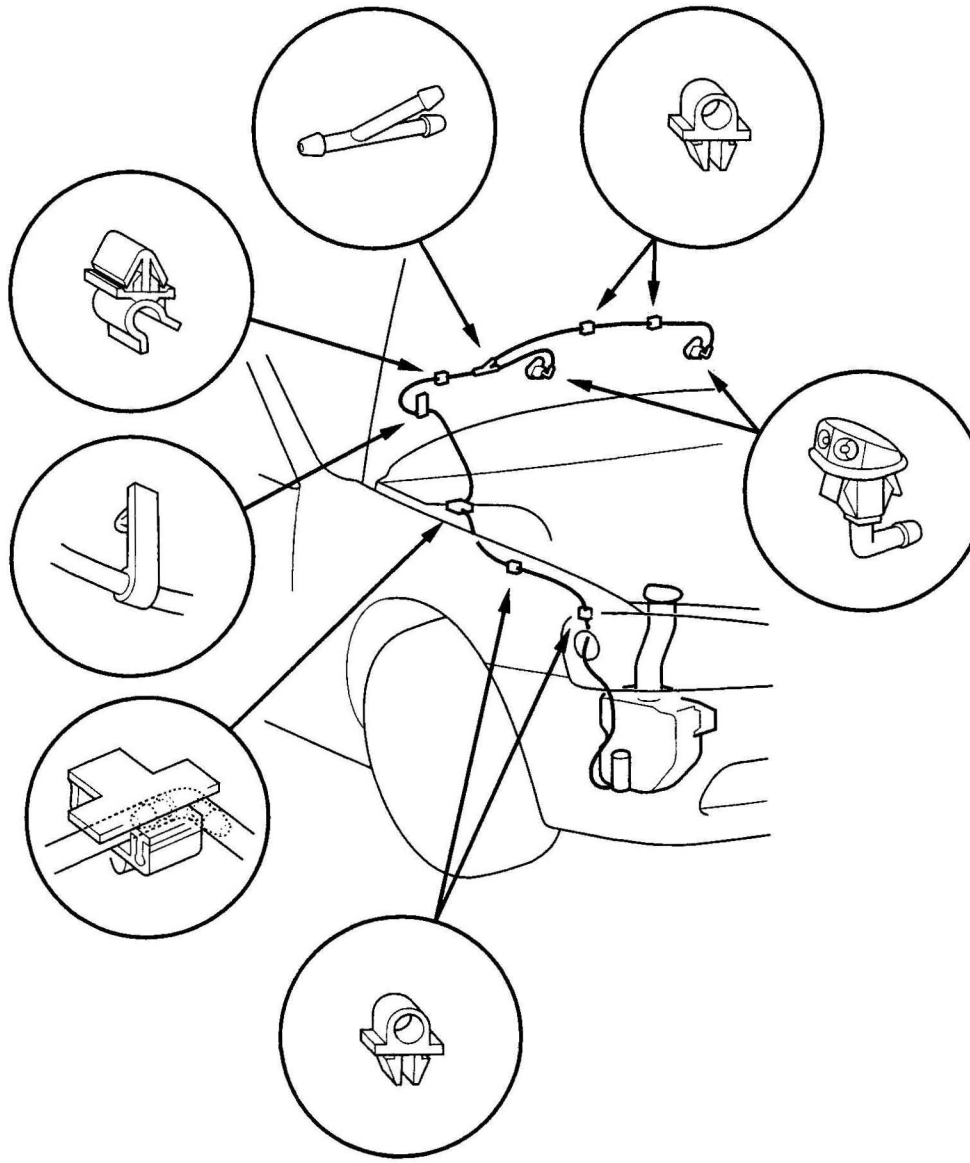
Terminal / Position	1	2
FLOAT UP		
FLOAT DOWN	○	○

BACK

Protected by AR

Washer Tube Replacement

1. Remove the right inner fender (see page 20-129).
2. Remove the windshield washer nozzles and clips, then remove the tube.

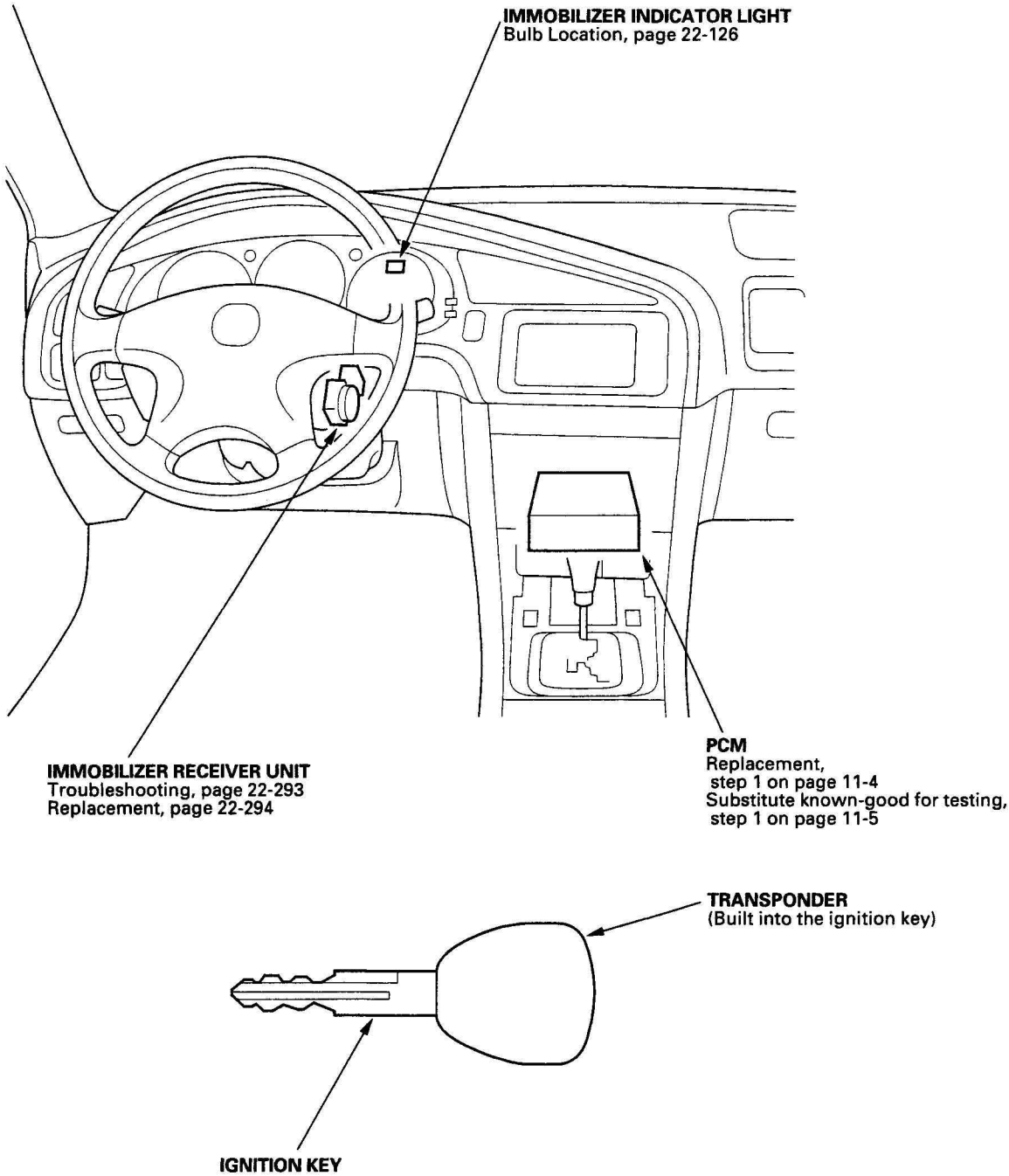


3. Install in the reverse order of removal. Take care not to pinch the washer tube. Check the windshield washer operation.

BACK

Protected by AR

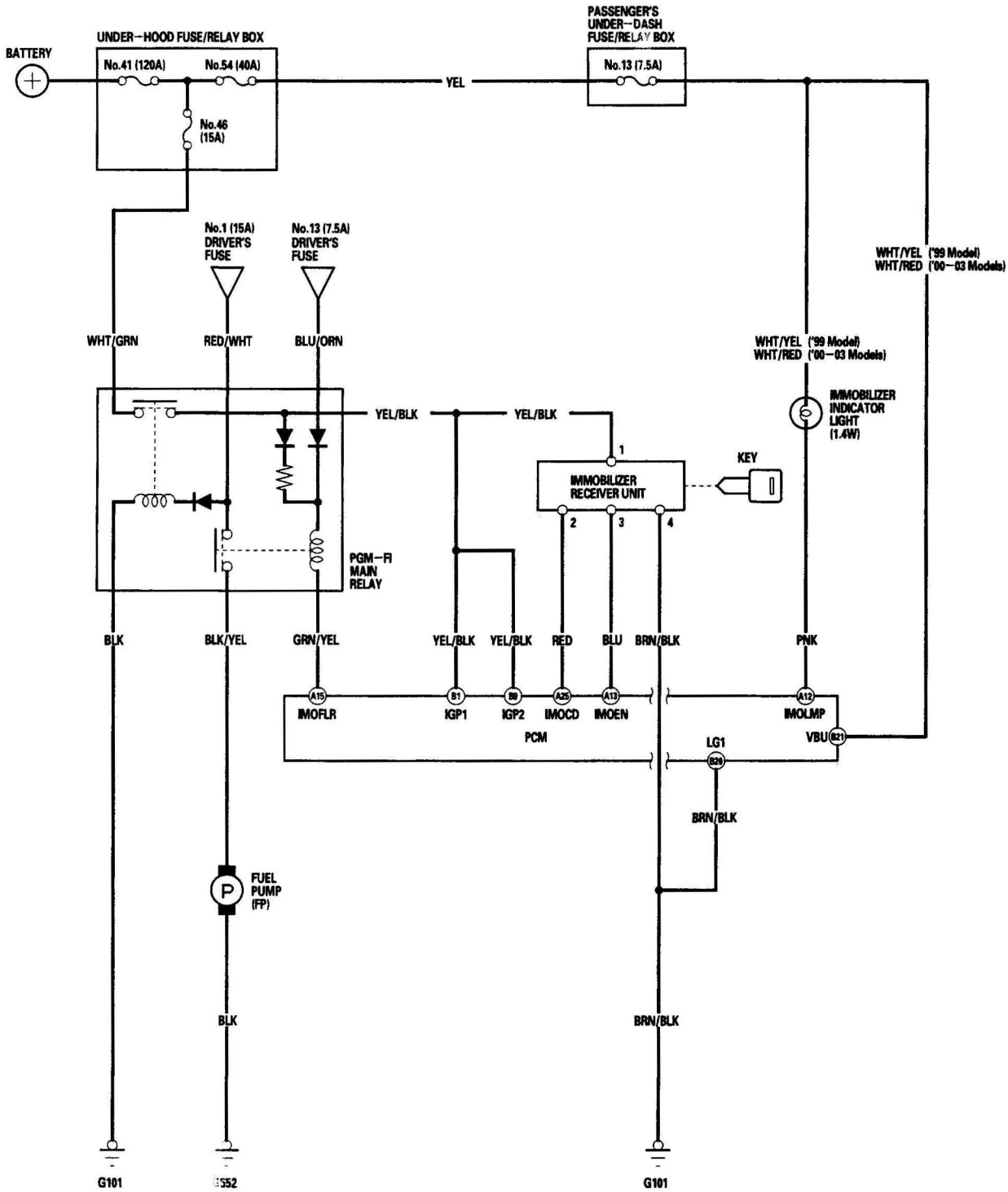
Component Location Index



Protected by AR

Immobilizer System

Circuit Diagram



BACK

Protected by AR

System Description

The vehicle is equipped with an immobilizer system that will disable the vehicle unless the proper ignition key is used. This system consists of a transponder located in the ignition key, an immobilizer receiver unit, an indicator light, and the PCM.

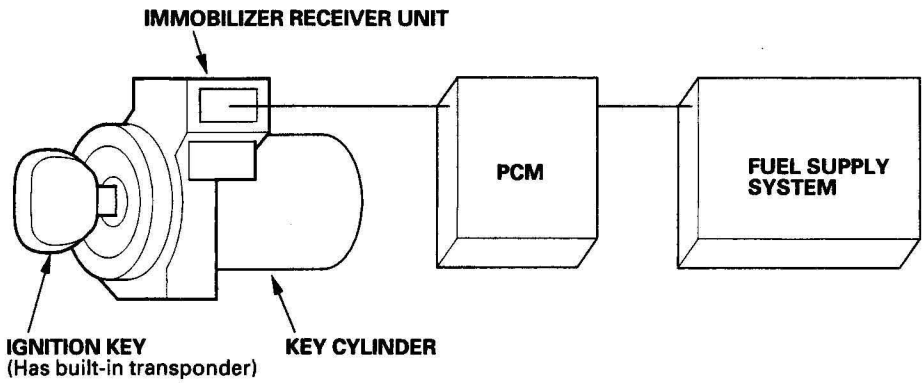
The vehicle has two kinds of keys.

- The black master key for:
  - ignition switch.
  - door locks.
  - tailgate lock.
  - glove box.

- The gray valet key for:
  - ignition switch.
  - door locks.

When the key is inserted in the ignition switch and turned to the (II) position, the immobilizer receiver unit sends power to the transponder in the ignition key. The transponder then sends a coded signal back through the immobilizer receiver unit to the PCM.

- The immobilizer system can store up to six key codes.
- If it is necessary to rewrite the PCM, the dealer needs the customer's vehicle, all its master keys and valet keys, and the Honda PGM Tester equipped with an immobilizer program card with the latest version of PGM Tester sohtware. Any key that is not learned during rewriting will no longer start the engine.
- It is possible to add ONE new key without reprogramming all of the keys (follow the prompts in the PGM Tester IMMOBI menu).
- If the customer has lost his key, and cannot start the engine, contact Acura Customer Relations.



(cont'd)

Protected by AR

System Description (cont'd)

- If the proper key has been used, the immobilizer indicator light will come on for about two seconds, then go off.
- If the wrong key has been used or the code was not received or recognized by the PCM, the indicator light will come on for about two seconds, then it will blink until the ignition switch is turned OFF. For accurate immobilizer system diagnosis get as much information from the customer as possible. A blinking indicator light means the key was not recognized.
- If the ignition switch turned OFF, the indicator will blink for about five seconds to signal that the immobilizer system has been set correctly, then the indicator will go off.

NOTE: Large metal objects, key fobs, other immobilizer keys, and other transpondars can interfere with the immobilizer signal. If an intermittant program is suspected, remove the ignition key from the key ring.

Problem	Part set	PGM-Tester required ?
① Master or valet key has been lost or additional master or valet key is required.	Blank key	YES
② All master and valet keys have been lost.	Blank key x 2, or 3	YES
③ Immobilizer receiver unit does not work.	Immobilizer receiver unit	NO
④ PCM does not work.	PCM	YES
⑤ Ignition switch does not work.	Ignition switch, Master keys, and valet key (rekey all lock cylinders to the new keys)	YES
⑥ Door key cylinder is broken.	Door key cylinder (rekey the cylinder)	NO

BACK

Protected by AR

Troubleshooting

Follow this procedure if the vehicle does not start, or after rewriting the PCM with the PGM-Tester and the vehicle does not start.

Note these items before troubleshooting:

- Due to the action of the immobilizer system, the engine takes slightly more time to start than engines of vehicle without an immobilizer system.
- When the system is normal, and the proper key is inserted, the indicator light comes on for 2 seconds, then it will go off.
- If the indicator starts to blink after 2 seconds, or if the engine does not start, repeat the starting procedure. If the engine still does not start, continue with this procedure.

1. Using a scan tool, check for a Diagnostic Trouble Code (DTC) (see page 11-3).

   Is DTC P1607 indicated?

   YES – Substitute the PCM with a known-good PCM and retest (see page 11-5). ■

   NO – Go to step 2.

2. Turn the ignition switch ON (II) with the proper key.

3. Check to see if the immobilizer indicator light comes on.

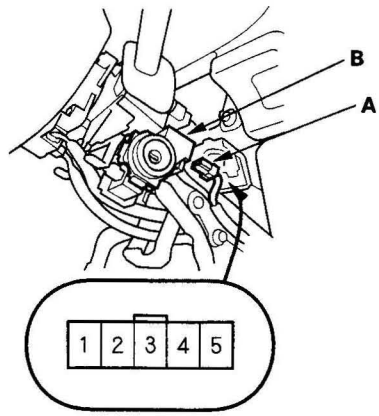
   Does the indicator light blink?

   YES – Go to step 4.

   NO – Check for these problems:

   - An open in the PNK wire between the gauge assembly and PCM. ■
   - A faulty immobilizer indicator light. ■
   - A blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ■

4. Disconnect the 5P connector (A) from the immobilizer receiver unit (B).



Wire side of female teminals

5. Check for voltage between the No.1 terminal and body ground with the ignition switch turned ON (II).

   Is there battery voltage?

   YES – Go to step 6.

   NO – Check for these problems:

   - A blown No. 1 (15A) fuse in the driver's under-dash fuse/relay box. ■
   - A blown No. 46 (15A) fuse in the under-hood fuse /relay box. ■
   - An open in the YEL/BLK wire between the PGM-FI main relay and the immobilizer receiver unit. ■
   - A faulty PGM-FI main relay. ■

(cont'd)

Protected by AR

Troubleshooting (cont'd)

6. Check for continuity between the No. 4 terminal and body ground.

   Is there continuity?

   YES – Go to step 7.

   NO – Repair open in the BRN/BLK wire between the immobilizer receiver unit and G101. ■

7. Check for continuity between the No. 2 terminal and the PCM.

   Is there continuity?

   YES – Go to step 8.

   NO – Repair open in the RED wire between the immobilizer receiver unit and PCM. ■

8. Check for continuity between the No. 3 terminal and PCM.

   Is there continuity?

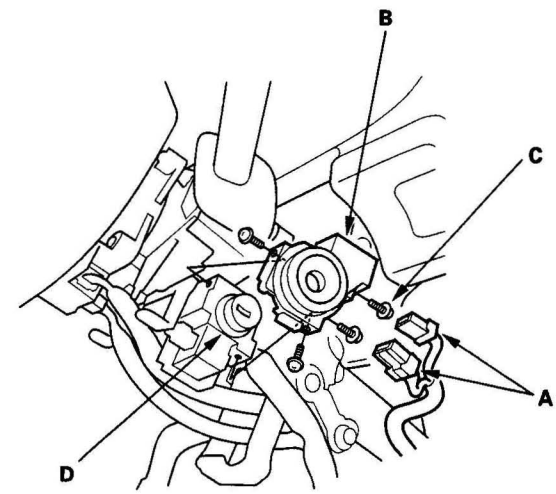
   YES – Replace the immobilizer receiver unit. ■

   NO – Repair open in the BLU wire between the immobilizer receiver unit and PCM. ■

Immobilizer Receiver Unit Replacement

NOTE: The PCM dose not need to be reprogrammed if only the receiver has been replaced.

1. Remove the driver's dashboard lower cover (see page 20-65).
2. Remove the steering column covers (see page 17-27).
3. Disconnect the 5P and 7P connectors (A) from the immobilizer receiver unit (B).

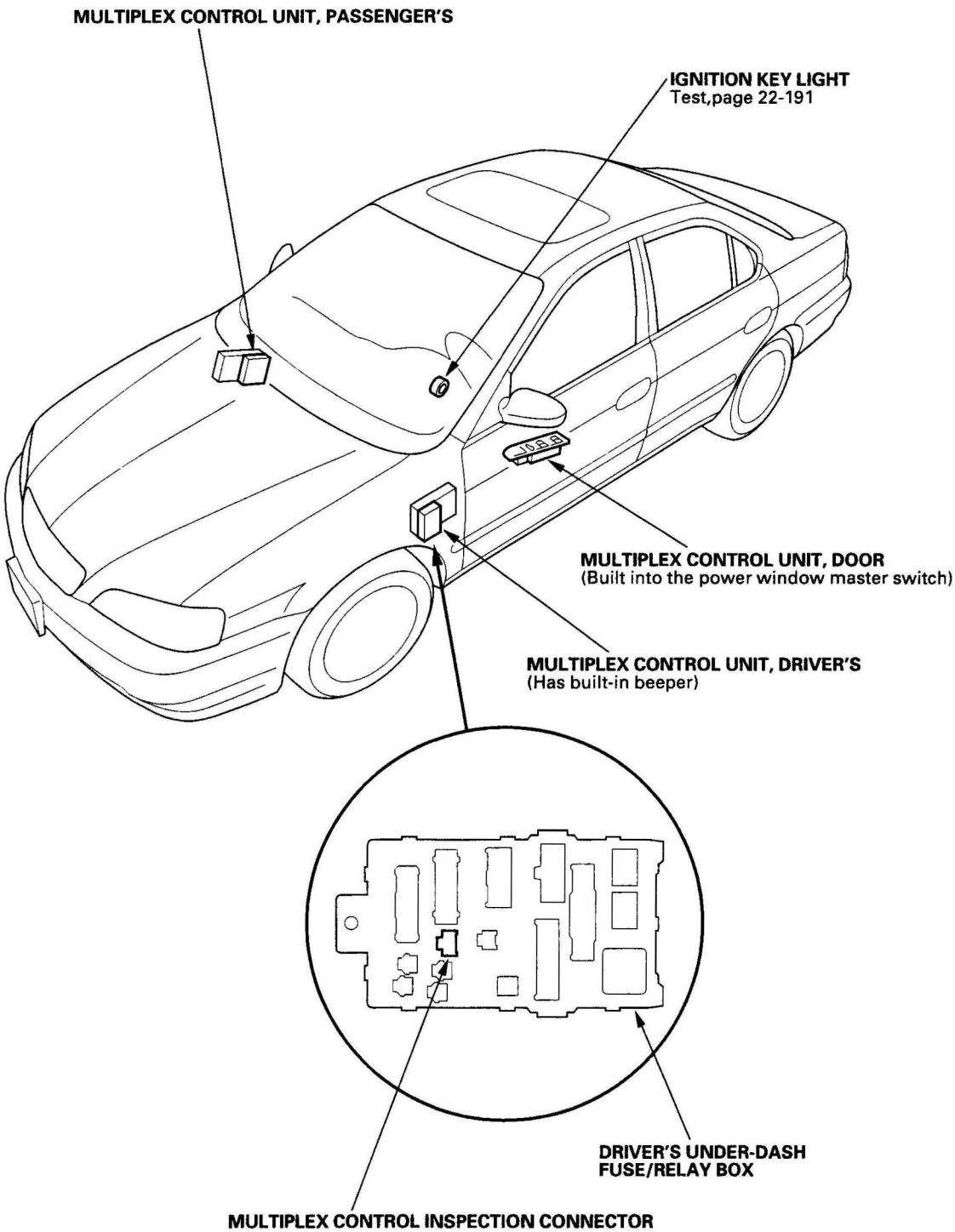


4. Remove the screws (C) and the immobilizer receiver unit from the ignition key cylinder (D).
5. Install in the reverse order of removal.
6. After replacement, check the immobilizer system.

BACK

Protected by AR

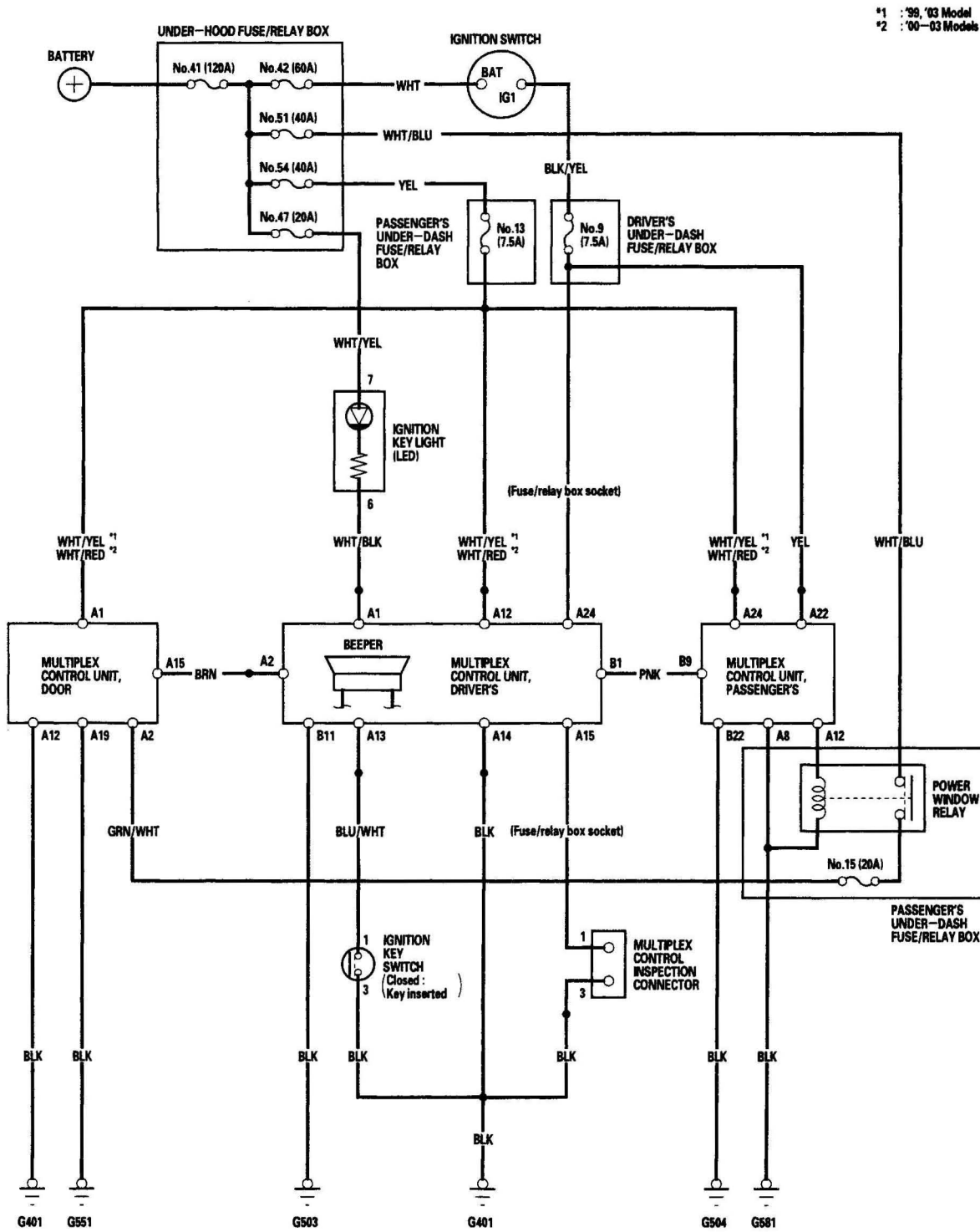
Component Location Index



Protected by AR

Multiplex Control System

Circuit Diagram (Power, Ground, Communication Lines)



BACK

Protected by AR

System Description

The multiplex Control System has four internal functions:
- Multiplexing (send multiple signals over shared wires)
- Wake up/sleep models (runs at full power only on demand to reduce battery draw)
- Fail-safe (fixes or ignores faulty signals)
- Self-diagnosis (Mode 1 for the system, Mode 2 for input lines)

The system controls the function of the following circuits
- Engine Oil Pressure Indicator
- Seat Belt Reminder
- Lights-on Reminder
- Key-in Reminder
- Key Light Timer
- Dash Lights Brightness Control
- Entry Light Control
- Automatic Lights-off
- Power Door Locks
- Power Window (including key-off timer operation)
- Wiper/Washer (including speed sensitive intermittent wiper)
- Keyless Entry/Security Alarm
- Interlock

Multiplex Communication

To reduce the number of wire harnesses, digital signals are sent via shared multiplex communication lines rather than sending normal electrical signals through individual wires.
- The input signals from each switch are converted to digital signals at the central processing unit (CPU). The digital signals are sent from the transmitter unit to the receiver unit as serial signals.
- The transmitted signal is converted to a switch signal at the receiver unit, and it operates the related component.
- There are exclusive communication lines between each of the multiplex control units:
  - Door ↔ Driver's (between the door and the driver's multiplex control units) Wire color: BRN
  - Driver's ↔ Passenger's (between the driver's and the passenger's multiplex control units) Wire color: PNK

The control units always communicate via these lines when the system is operating, and they stop communicating when the system is OFF.

Wake-up and Sleep

The multiplex control system has "wake-up" and "sleep" functions to decrease parasitic draw on the battery when the ignition switch is OFF.
- In the sleep mode, the multiplex control unit stops the functions (communication and CPU control) when it is not necessary for the system to operate.
- As soon as any operation is requested (for example, door is unlocked), the related control unit in the sleep mode immediately wakes up and begins to function. This control unit also sends a wake-up signal to the other control units via the communication lines.
- When the ignition switch is turned OFF, and driver's or front passenger's door opened, then closed, there is about a 10 second delay before the control units go from the wake-up mode to the sleep mode.
- If any door is open, the sleep mode will not function.
- If a key is in the ignition switch, the sleep mode will not function.

Fail-safe

To prevent improper operation, the multiplex control system has a fail-safe function. In the fail-safe mode, the output signal is fixed when any part of the system malfunctions (for example, a faulty control unit or communication line).
Each control unit has a hardware fail-safe function that fixes the output signal when there is any CPU malfunction, and a software fail-safe function that ignores the signal from the malfunctioning control unit and allows the system to operate normally.

BACK

Protected by AR

Troubleshooting

Special Tool Required:
MPCS Service Connector 07WAZ-001010A

1. Check the driver's No. 9 and the passenger's No. 13 fuses.

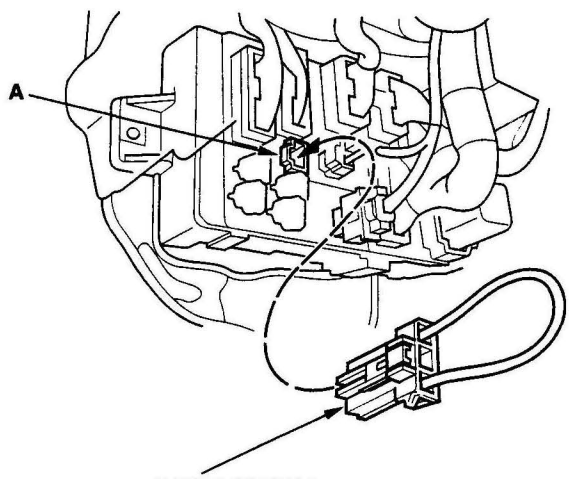
   Are the fuses OK?

   YES – Go to step 2.

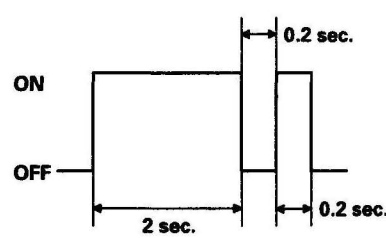
   NO – Find and repair the cause of the blown fuse. ■

2. Turn the ignition switch ON (II). If the driver's seat belt is unbuckled, the seat belt reminder will beep five times.

3. Check self-diagnosis function Mode 1 for a diagnostic trouble code (DTC) by connecting the special tool to the multiplex control inspection socket (A). After about 5 seconds, the ignition key light should come on and the beeper should beep for 2 seconds, go off for 0.2 second, then blink and beep for 0.2 second. This means that you are in Mode 1 of the self-diagnosis function.



MODE 1: IGNITION KEY LIGHT and BEEPER



4. If there is a DTC, it will blink/beep, pause, then repeat the DTC as long as the ignition switch is ON (II).

   Is there a repeating DTC?

   YES – Count the blinks/beeps, then go to step 7.

   NO – See if the SCS circuit is working properly. Go to step 5.

5. Check for continuity between the No. 3 terminal in the inspection connector and the A15 terminal in the driver's unit.

   Is there continuity?

   YES – Go to step 7.

   NO – Repair the open in the wire, and recheck for DTCs. ■

6. Check for continuity between the No. 1 terminal of the inspection connector and body ground.

   Is there continuity?

   YES – Go to step 12.

   NO – Replace the driver's under dash fuse/relay box and recheck for DTCs. ■

7. One second after you go into self-diagnosis mode 1, the ignition key light and beeper indicate the DTC, and repeat it every 3 seconds. If there is more than one DTC, the system will indicate them in ascending order, beginning from the DTC with the lowest numerical value. Find your DTC in this table, then go to step 8 and check the communication lines.

DTC	Cause
1	The driver's unit is not able to receive signals from the door unit.
2	The driver's unit is not able to receive signals from the passenger's unit.
3	Malfunction in the driver's unit.
4	Signals from each unit do not match.
5	The passenger's unit is not able to receive signals from the other units.
6	The door unit is not able to receive signals from the other units.

BACK

Protected by AR

8. With the ignition switch OFF, check for continuity according to the table.

Communication Line	Wire	Continuity
Door unit to Driver's unit	BRN	YES
Driver's unit to Passenger's unit	PNK	YES

Is there continuity?

YES – Go to step 9.

NO – Check for an open in the wire. ■

9. Turn the ignition switch ON (II), and check for voltage between the communication line and ground.

Communication Line	Wire	Voltage
Door unit to Driver's unit	BRN	3.5 – 9.5
Driver's unit to Passenger's unit	PNK	3.0 – 10.0

Does the voltage match the table?

YES – Communication lines are OK. Go to step 10.

NO – Repair the line according to the following. ■

- If the voltage is too high:
  - Check for a short to another wire.
  - Check for poor contact in the connector at the receiving unit.
- If the voltage is too low:
  - Check for a short to ground or to another wire.
  - Check for poor contact at the connector on the transmitting unit.
  - Faulty circuit in the transmitting unit.

10. Shift to the sleep mode:
    - Turn the ignition switch OFF.
    - Cancel the key-off operation timer in the power window system by opening and closing one of the doors.
    - Make sure that the exterior lights are off. If you do not operate any switches related to the multiplex control units within one minute after meeting the above conditions, the system function shifts to the sleep mode. (All of the switches must be turned OFF except door lock knob switches).

11. Confirm the sleep mode:
    - Check for voltage between each communication line and body ground while shifting to the sleep mode. There should be battery voltage.
    - Check the parasitic draw at the battery while shifting to the sleep mode. Amperage should change from about 70 through 80 mA to less than 10 to 20 mA.

12. Confirm the wake up mode.
    - When the ignition switch is turned ON (II), all of the multiplex control units wake up at the same time without "talking" to each other through the communication lines.
    - When any switch in the multiplex system is turned on, it wakes up its related control unit which, in turn, wakes up the other units.

After confirming the sleep mode, look in the following tables for the switch most closely related to the problem. Operate that switch and see if its control unit wakes up.

NOTE: If any control unit is faulty and will not wake up, several parts of the system will malfunction at the same time.
In each table below, the control unit is followed by a list of the switches and input signals that can wake it up.

Multiplex Control Unit, Passenger's No. 13 (7.5 A) passenger's fuse
Communication lines (BRN, PNK)
Front passenger's door switch (OPEN)
Front passenger's door key cylinder switch (LOCK/UNLOCK)
Front passenger's door lock switch (LOCK/UNLOCK)
Front passenger's door lock knob switch (UNLOCK)
Keyless transmitter (LOCK)
Keyless transmitter (UNLOCK)
Keyless transmitter (TRUNK)
Right rear door switch (OPEN)
Right rear door lock knob switch (UNLOCK)
Radio/navigation display security input
* Grounded through the radio/navigation display connector. Test by disconnecting connector from radio.

(cont'd)

BACK

Protected by AR

Troubleshooting (cont'd)

Multiplex Control Unit, Driver's No. 9 (7.5 A) driver's fuse
Communication lines (BRN, PNK)
Ignition key switch Combination switch Driver's door switch (OPEN) Left rear door switch (OPEN) Left rear door lock knob switch (UNLOCK) Trunk latch switch (OPEN) Trunk key cylinder switch Engine hood switch (OPEN)

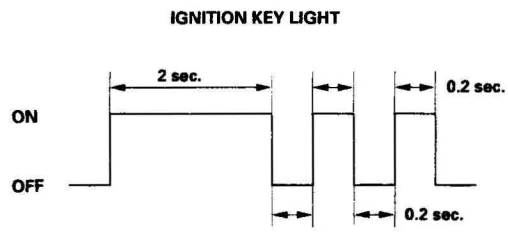
Multiplex Control Unit, Door No. 15 (20 A) passenger's fuse
Communication lines (BRN, PNK)
Driver's door key cylinder switch (LOCK/UNLOCK) Driver's door lock knob switch (LOCK/UNLOCK) Driver's door lock switch (LOCK/UNLOCK)

Is the wake-up function OK?

YES—Troubleshoot the individual system function that had a problem. Go to step 13.

NO—Test power and ground to all three multiplex control unit (see page 22-192).■

13. From Mode 1, disconnect the special tool from the multiplex control inspection connector for about 10 seconds, then reconnect it. The ignition key light should come on and the beeper should beep for 2 seconds, then blink and beep twice more at 0.2 second intervals. This means the system has gone from Mode 1 to Mode 2.
MODE 2:



NOTE: To cancel mode 2, disconnect the SCS service connector from the multiplex control inspection connector for more than 10 seconds or turn the ignition switch OFF.

14. Look in the following tables for the switch most closely related to the problem. While still in Mode 2, operate the switches to test the circuits between the switches and their control units. If the circuit is OK, the ignition key light should blink once and the beeper should beep once. If the circuit is faulty, there will be no indication.

Does the ignition key light blink and beeper beep?

YES—The circuit is OK. Refer to the test(s) for that individual system.■

NO—Go to step 15.

In each table below, the control unit is followed by a list of circuits that it can check in Mode 2.

Multiplex Control Unit, Passenger's
Front passenger's door switch (OPEN) Front passenger's door key cylinder switch (LOCK/UNLOCK) Front passenger's door lock switch(LOCK/UNLOCK) Front passenger's door lock knob switch (UNLOCK)** Keyless transmitter (LOCK) Keyless transmitter (UNLOCK) Keyless transmitter (TRUNK) Right rear door switch (OPEN) Right rear door lock knob switch (UNLOCK) Radio/navigation display security input * Ground through radio connector. Test by disconnecting the connector from radio/navigation display. **When testing a door lock knob, be sure all other door lock knobs are in the locked position.

BACK

Protected by AR

Multiplex Control Unit, Driver's
Transmission range switch [P]
Brake switch (ON)
Dash lights brightness controller (TURNING)
Driver's door switch (OPEN)
Driver's seat belt switch (UNLATCHED)
Engine hood switch (OPEN)
Combination light switch (ON)
Left rear door switch (OPEN)
Left rear door lock knob switch (UNLOCK) *
Parking brake switch (ON)
Trunk latch switch (OPEN)
Windshield wiper/washer switch (except MIST switch)
*When testing a door lock knob, be sure all other door lock knobs are in the locked position.

Multiplex Control Unit, Door
Driver's key cylinder switch (LOCK/UNLOCK)
Driver's door lock knob switch (LOCK/ UNLOCK)
Driver's door lock switch (UNLOCK)
Power window master switch

The key cylinder switches should only beep/flash when turned to LOCK or UNLOCK. If they beep/flash when returning to the neutral position, the switch is defective or misaligned. Adjust or replace the affected key cylinder switch.

15. Check 2 or 3 more circuits listed for that control unit.

Does the ignition key light blink and the beeper beep for each circuit?

YES—The additional circuits are OK. Repair the short or open in the circuit that failed the test in the preceding step.■

NO—Multiplex failed circuits can mean that the control unit has failed without triggering a DTC. Test a few more circuits. If they also fail, substitute a known-good control unit, then recheck. If the system works properly, the original control unit is faulty, replace it. there is still a malfunction, substitute a know-good control unit for the next most likery faulty control unit, then recheck. If the system works properly, that control unit is faulty; replace it.■

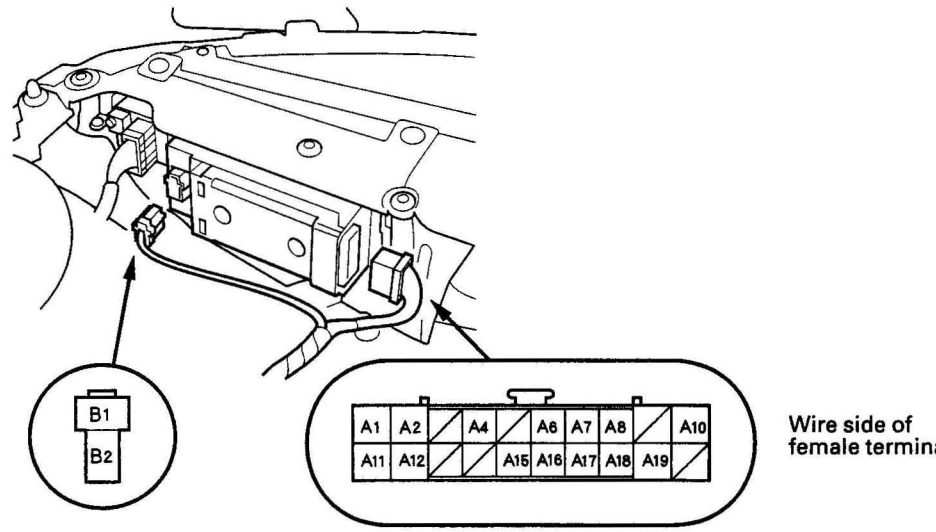
BACK

Protected by AR

Multiplex Control Unit Input Test

Door Unit:

1. Remove the driver's door panel, and disconnect the connectors from the door multiplex control unit.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 3.
3. Make the following input tests at the connector A.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 4.



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/YEL ('99, '03 models) WHT/RED ('00-02 models)	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A2	GRN/WHT ('99-02 models) WHT/YEL ('03 model)	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 15 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty power window relay • An open in the wire
A12	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
A19	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G551) • An open in the wire

BACK

Protected by AR

Passenger's Unit

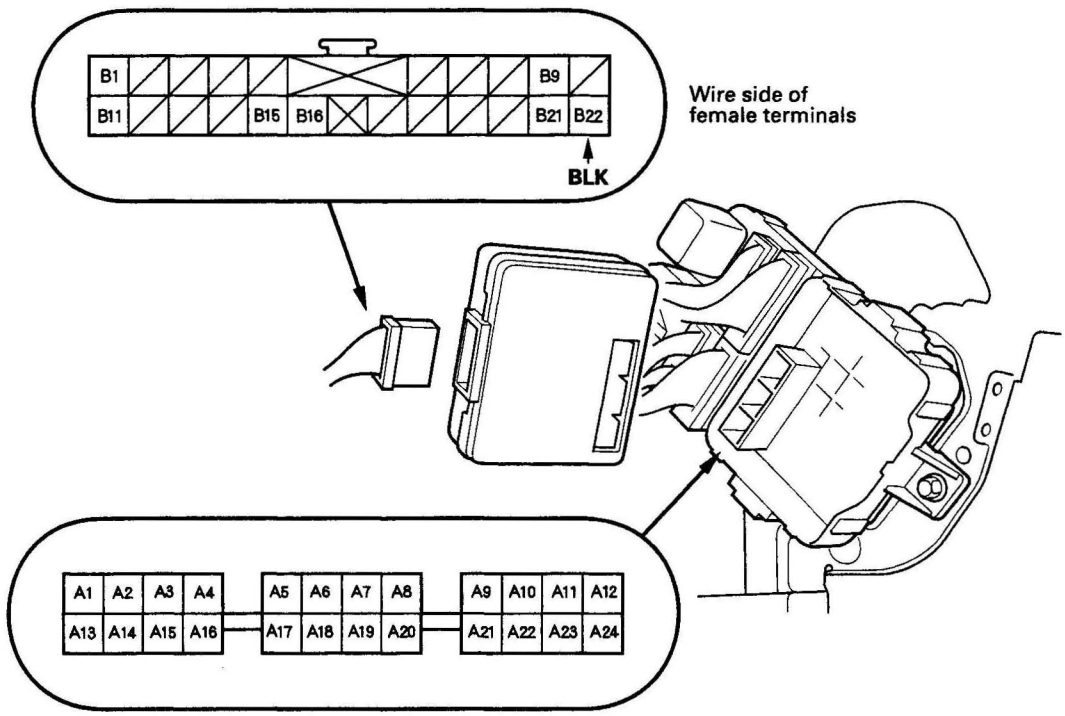
4. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box.

5. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 6.

6. Make the following input tests at the connector B and the passenger's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 7.



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A24	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • Faulty passenger's fuse/relay box
A8		Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G581) • An open in the wire
A22		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A12		Ignition switch OFF Jump A12 to A24	All power windows and moonroof should operate.	• Poor ground (G581) • Faulty power window relay • An open in the wire
B22	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G504) • An open in the wire

(cont'd)

Protected by AR

Multiplex Control Unit Input Test (cont'd)

Driver's Unit:

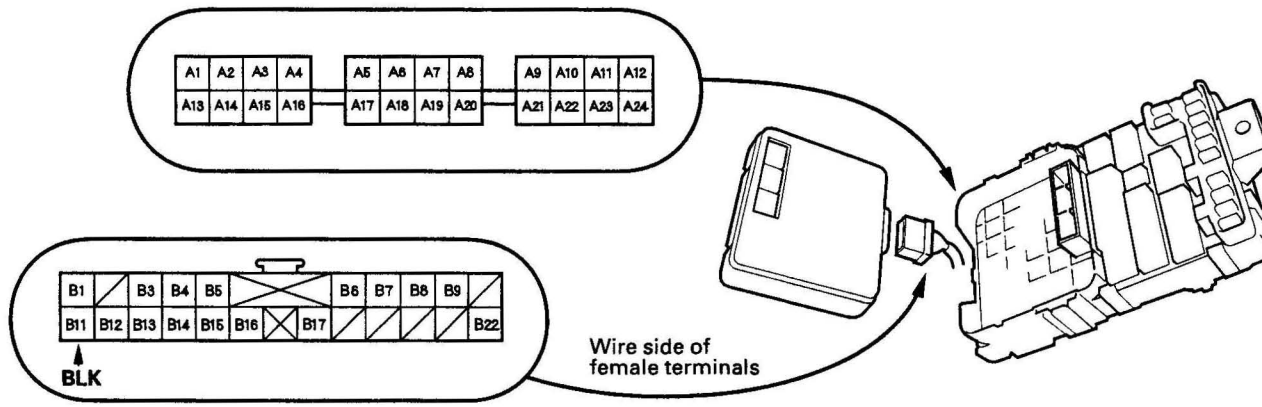
7. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.

8. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 9.

9. Make the following input tests at the connector B and the driver's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, troubleshoot the Multiplex Control System (see page 22-298).



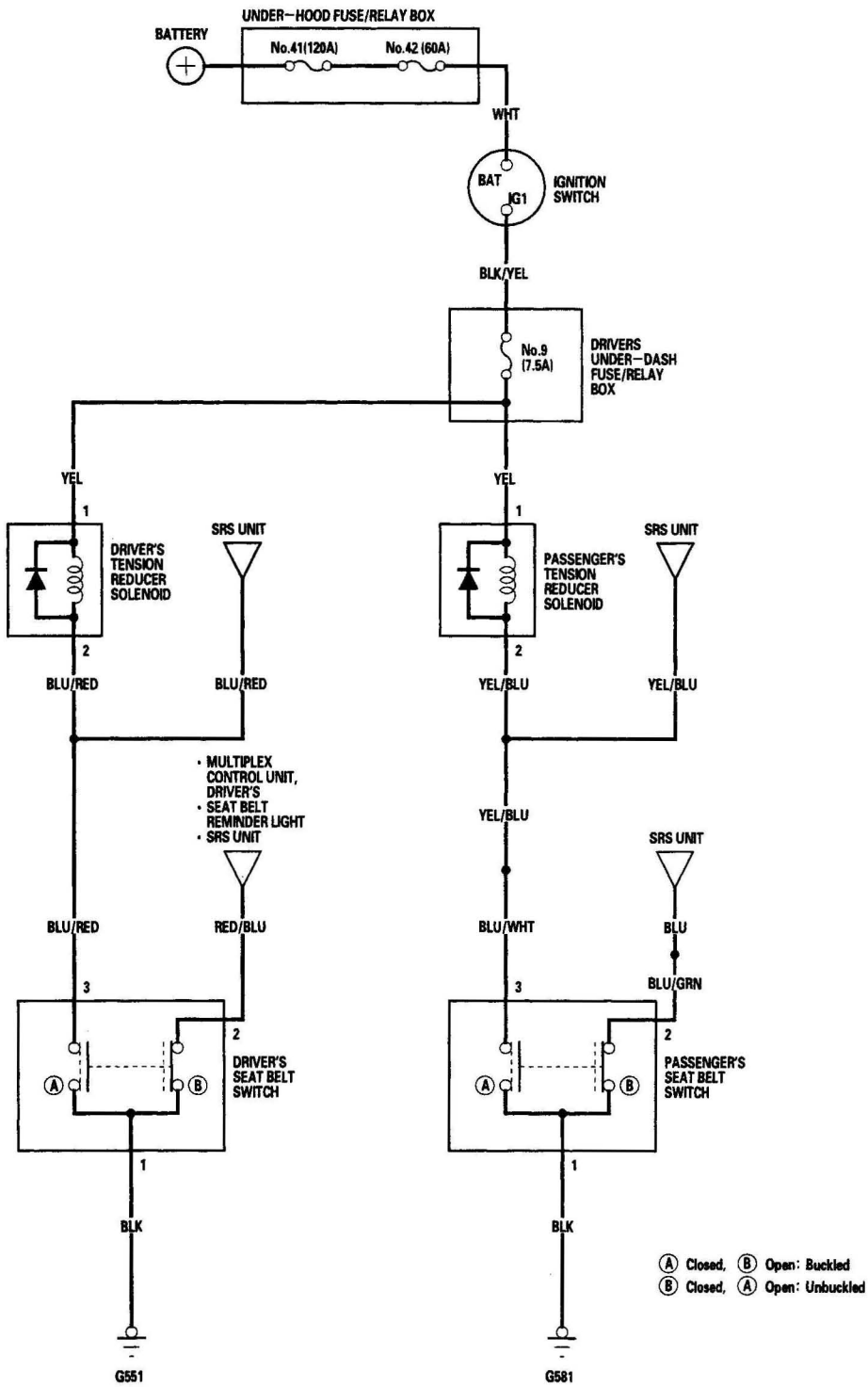
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A14		Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty driver's fuse/relay box
A13		Ignition key is inserted into the ignition switch	Check for continuity to ground: There should be continuity.	• Faulty ignition key switch • An open in the wire • Poor ground (G401)
A1		Under all conditions	Attach to ground: Ignition key light should come on.	• Blown No. 47 (20A) fuse in the under-hood fuse/relay box • Blown LED • An open in the wire
A15		Short the multiplex control inspection connector terminals.	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • An open in the wire

BACK

Protected by AR

Seat Belt Tension Reducer

Circuit Diagram



BACK

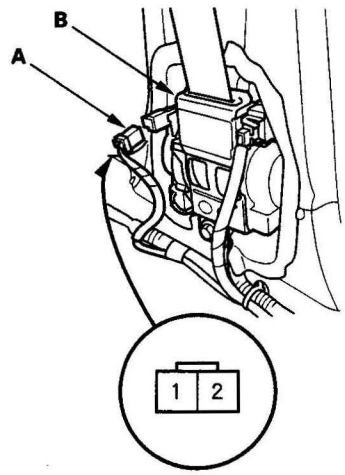
Protected by AR

Seat Belt Tension Reducer

Test

1. Remove the seat side trim (see page 20-55).

2. Disconnect the 2P connector (A) from the seat belt tension reducer (B).



Wire side of female terminals

3. Check for voltage between the No. 1 (+) terminal and body ground with the ignition switch ON (II). There should be battery voltage.

   - If there is no voltage, check for:
     - a blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box.
     - an open in the YEL wire.
   - If there is battery voltage, go to step 4.

4. Turn the ignition switch OFF, and reconnect the 2P connector to the seat belt tension reducer.

5. Check for voltage between the No. 2 terminal and body ground with the ignition switch ON (II) and the seat belt unbuckled.
   There should be battery voltage.

   - If there is no voltage, check for a faulty seat belt switch, short to body ground on the BLU/RED (or YEL/BLU) wire, or replace the seat belt tension reducer.
   - If there is battery voltage, go to step 6.

6. Turn the ignition switch OFF.

7. Check for continuity between the No. 2 terminal and body ground with the seat belt buckled.
   There should be continuity.

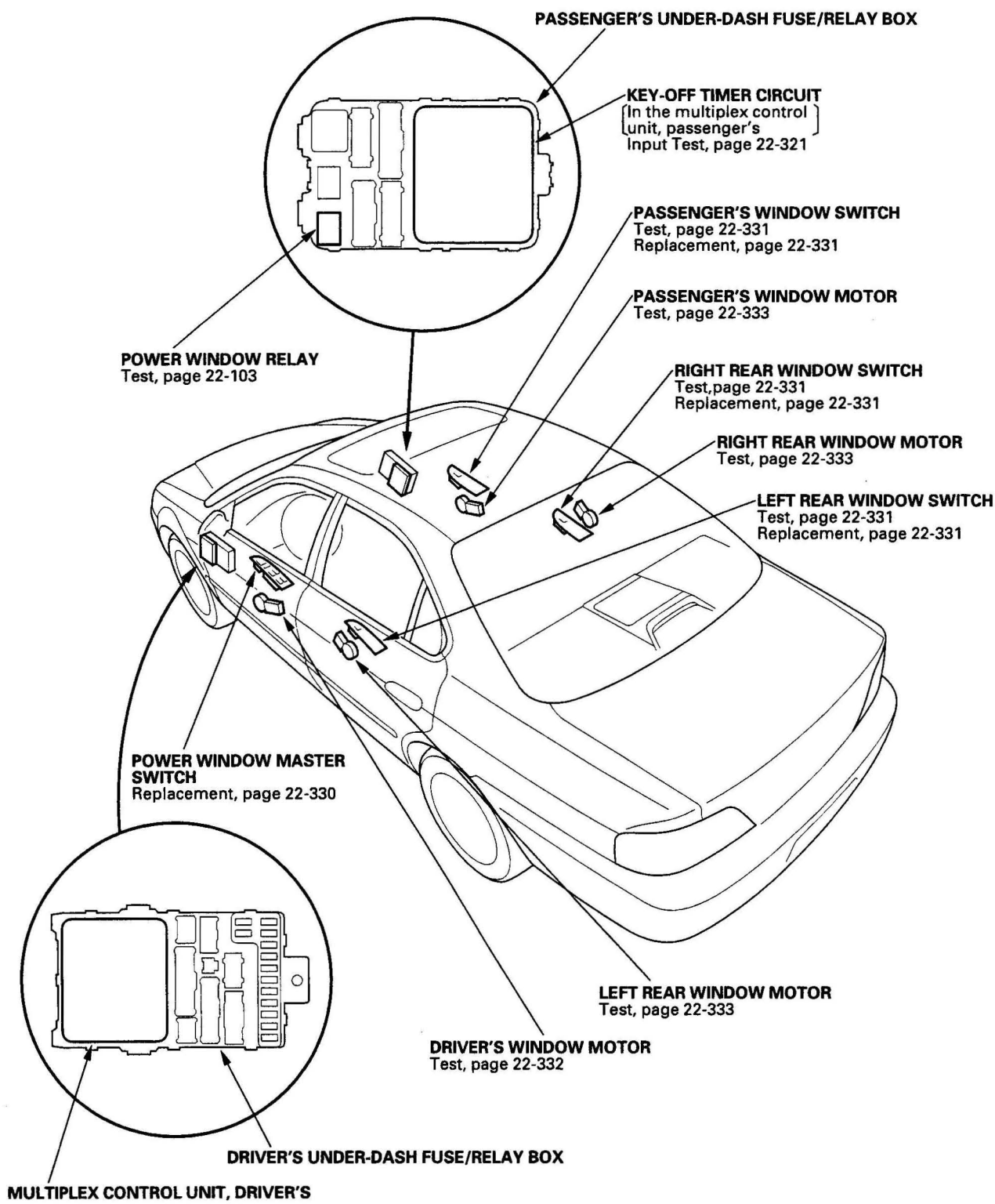
   - If there is no continuity, check for:
     - poor ground (G551, G581).
     - an open in the wire.
     - faulty seat belt switch.

BACK

Protected by AR

Power Windows

Component Location Index



BACK

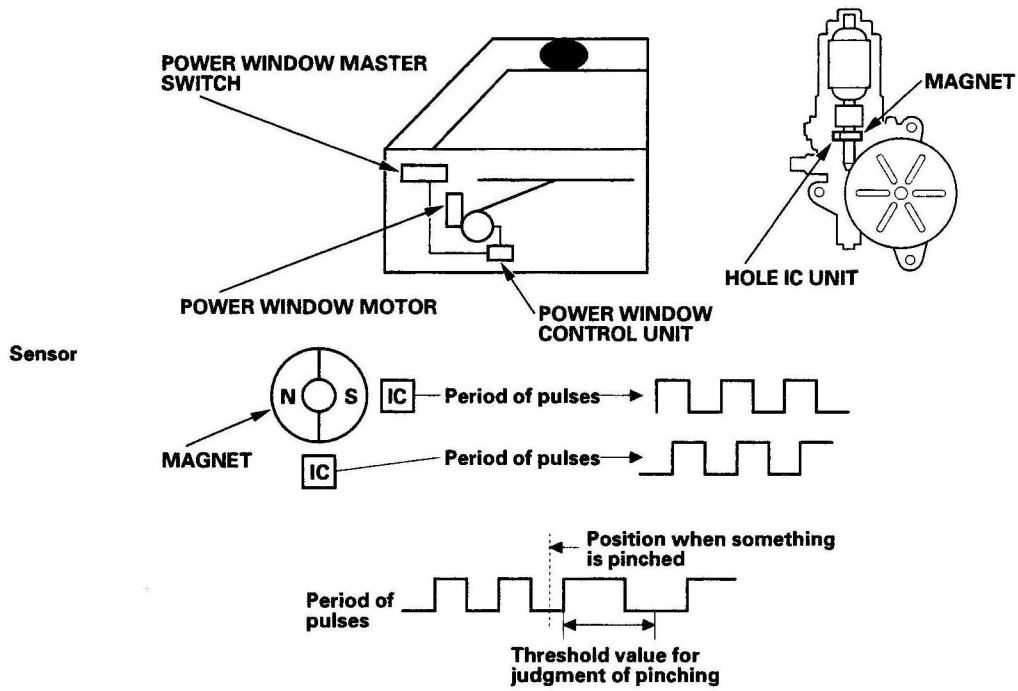
Protected by AR

Power Windows

Descriptions

'02-03 Models

The driver's window will stop and automatically open if you pinch your hand or something during auto-up operation. The system is composed of the power window master switch, the power window control unit and the driver's window motor.
The power window motor incorporates a pulser which generates pulses during the motor's operation and sends the pulses to the power window control unit. As soon as the power window control unit detects no pulses from the pulser, the control unit makes the power window motor stop and reverse.



Resetting the power window control unit

Resetting the power window control unit is required after performing the following procedures:

- disconnecting the battery.
- removing the No. 1 (20A) fuse in the driver's under-dash fuse/relay box.
- disconnecting the 18P connector from the power window control unit.
- removing the window regulator, glass or glass run channel.

1. Make sure the glass is installed properly.
2. Turn the ignition switch OFF.
3. Remove the No. 1 (20A) fuse in the driver's under-dash fuse/relay box.
4. Turn the ignition switch ON (II) on for seconds, then turn it OFF. Reinstall the No. 1 (20A) fuse in the driver's under-dash fuse/relay box.
5. Make sure the driver's window does not work in AUTO with the ignition switch ON (II).
6. Turn the ignition switch ON (II).
7. Move the driver's window all the way down by using the driver's switch.
8. Move the driver's window all the way up by using the driver's switch, when the window reaches the top, hold the driver's window switch in the UP position for 2 seconds.

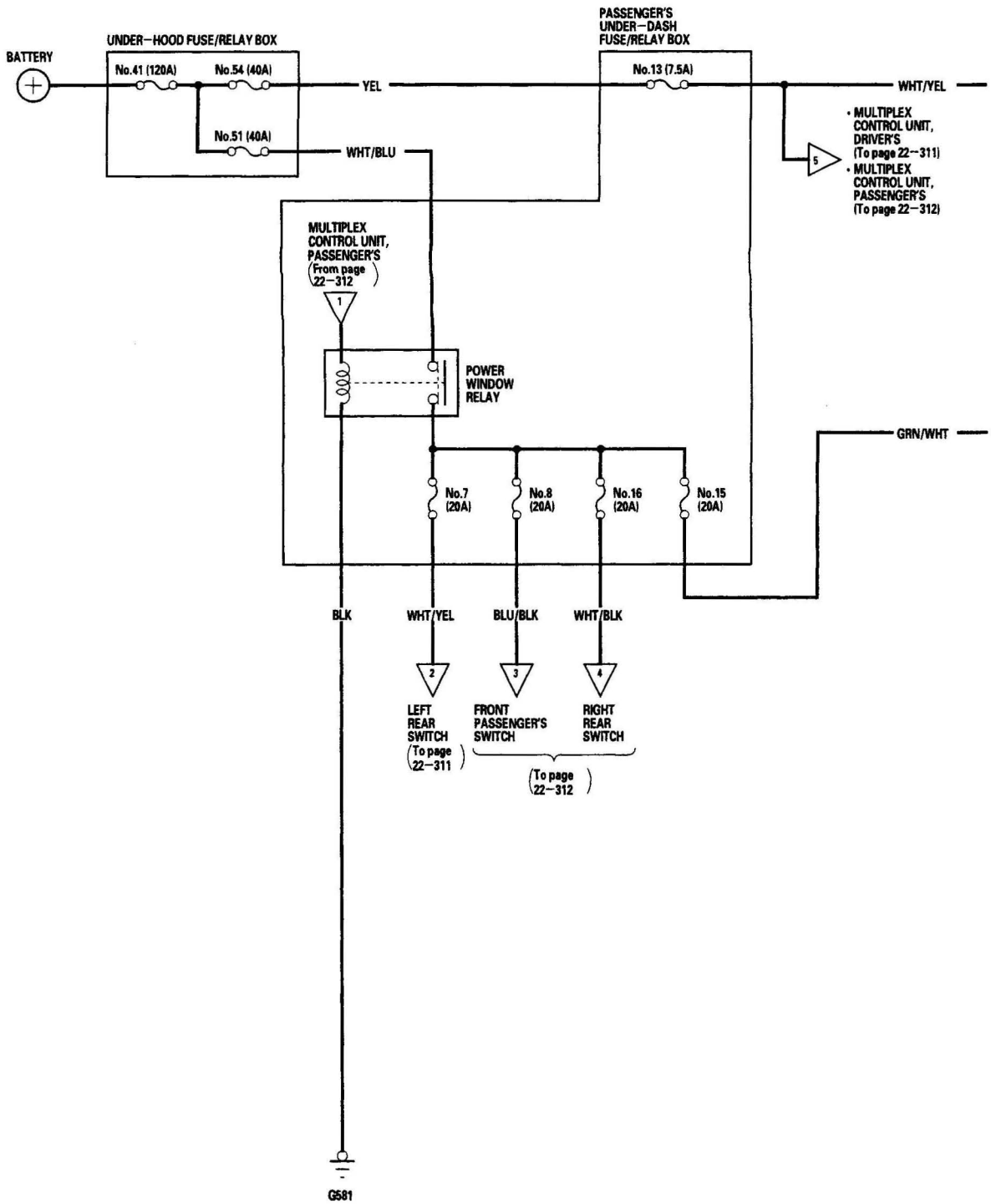
* If the window does not work in AUTO, reset the power window master switch according to the above procedures again.

BACK

Protected by AR

Circuit Diagram

'99 Model



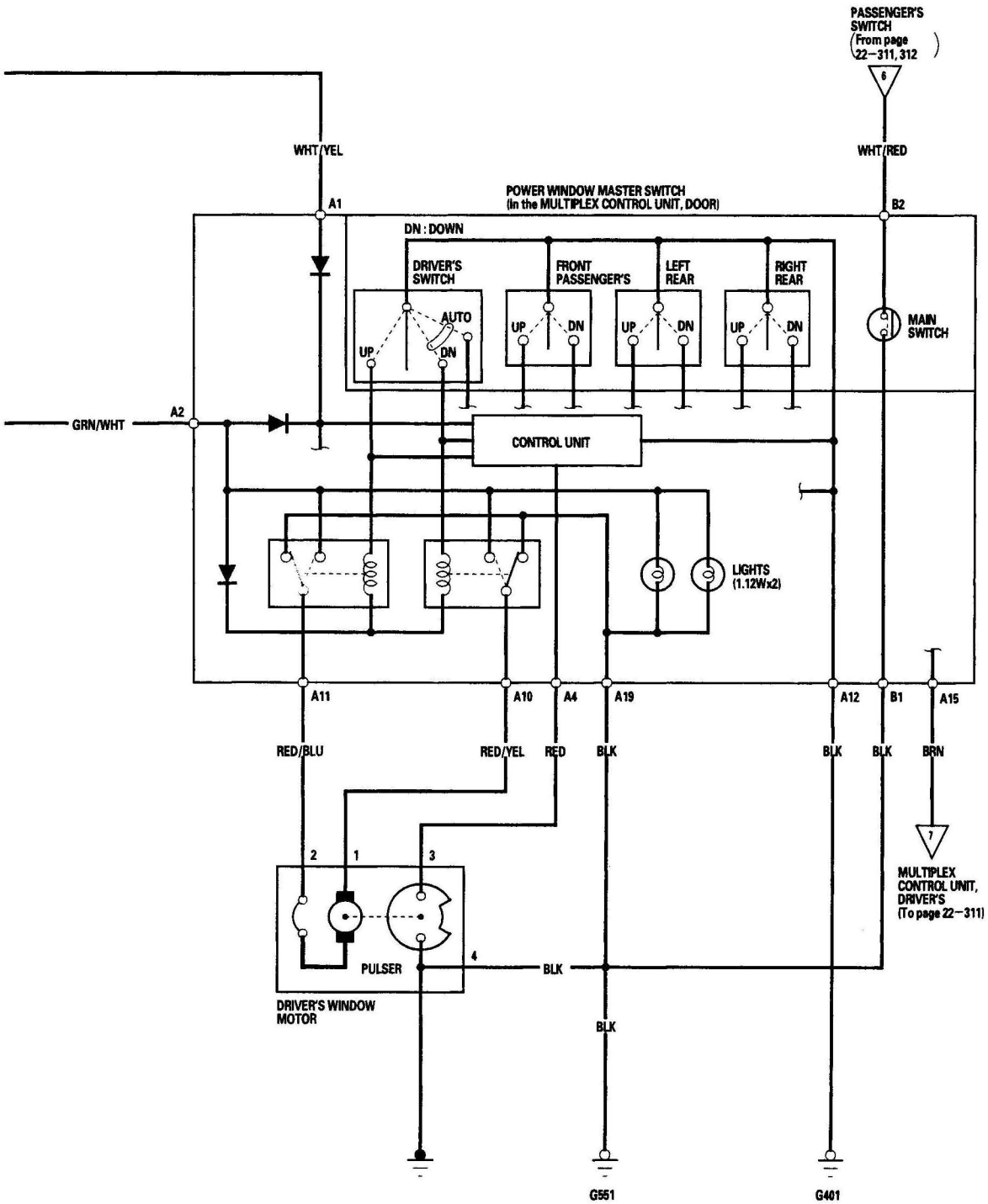
(cont'd)

BACK

Protected by AR

Power Windows

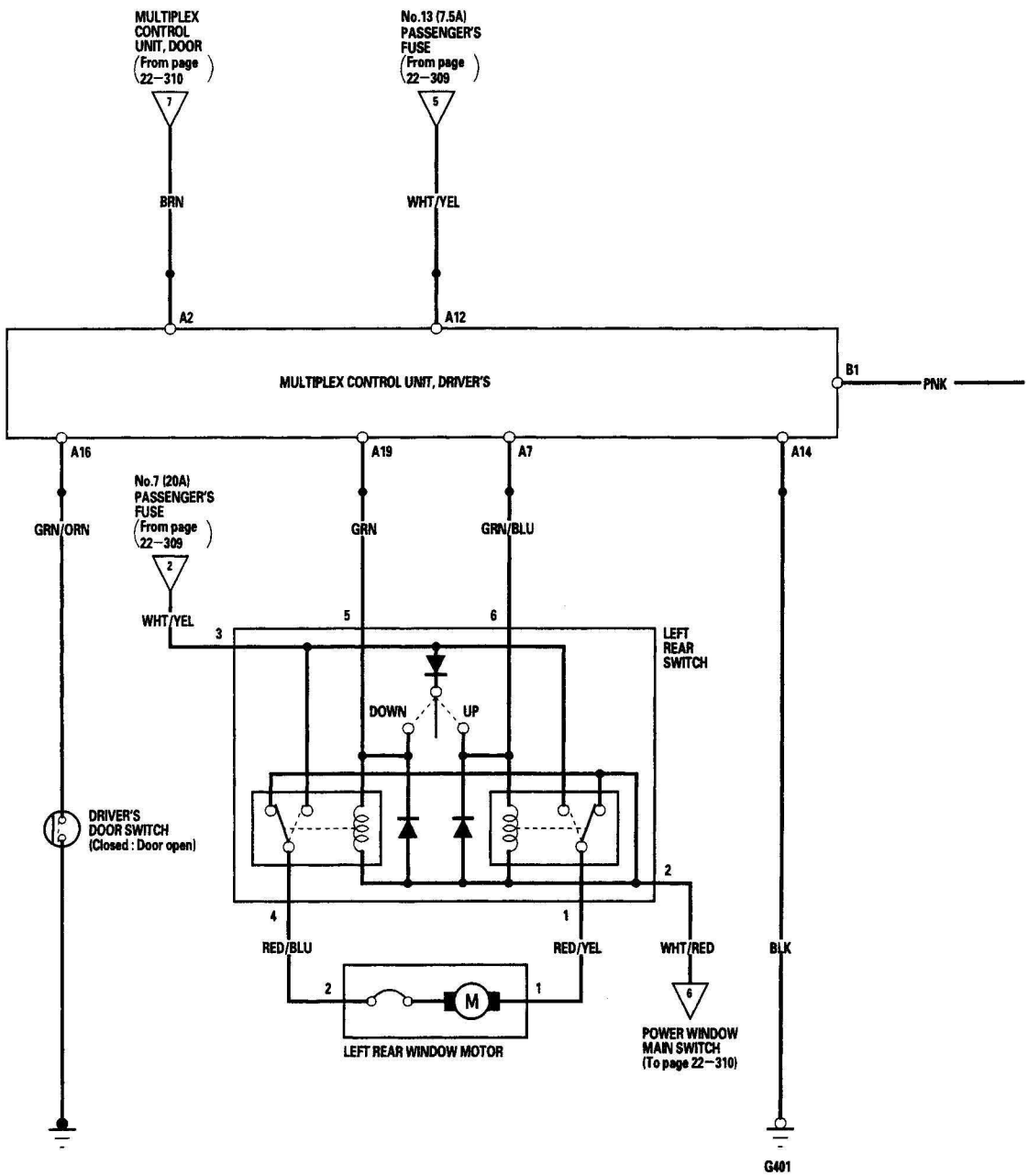
Circuit Diagram (cont'd)



BACK

Protected by AR

'99 Model

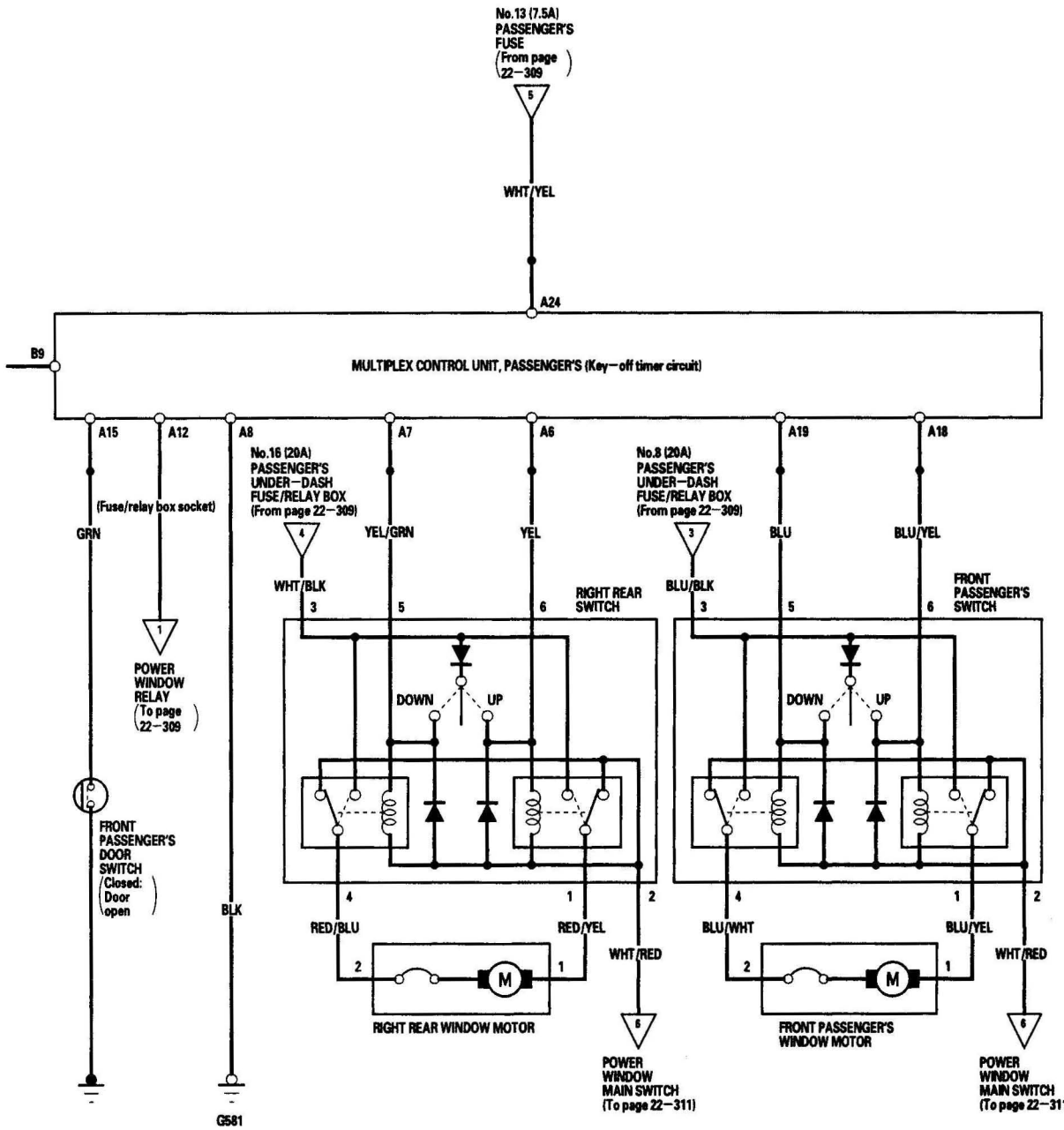


(cont'd)

BACK

Protected by AR

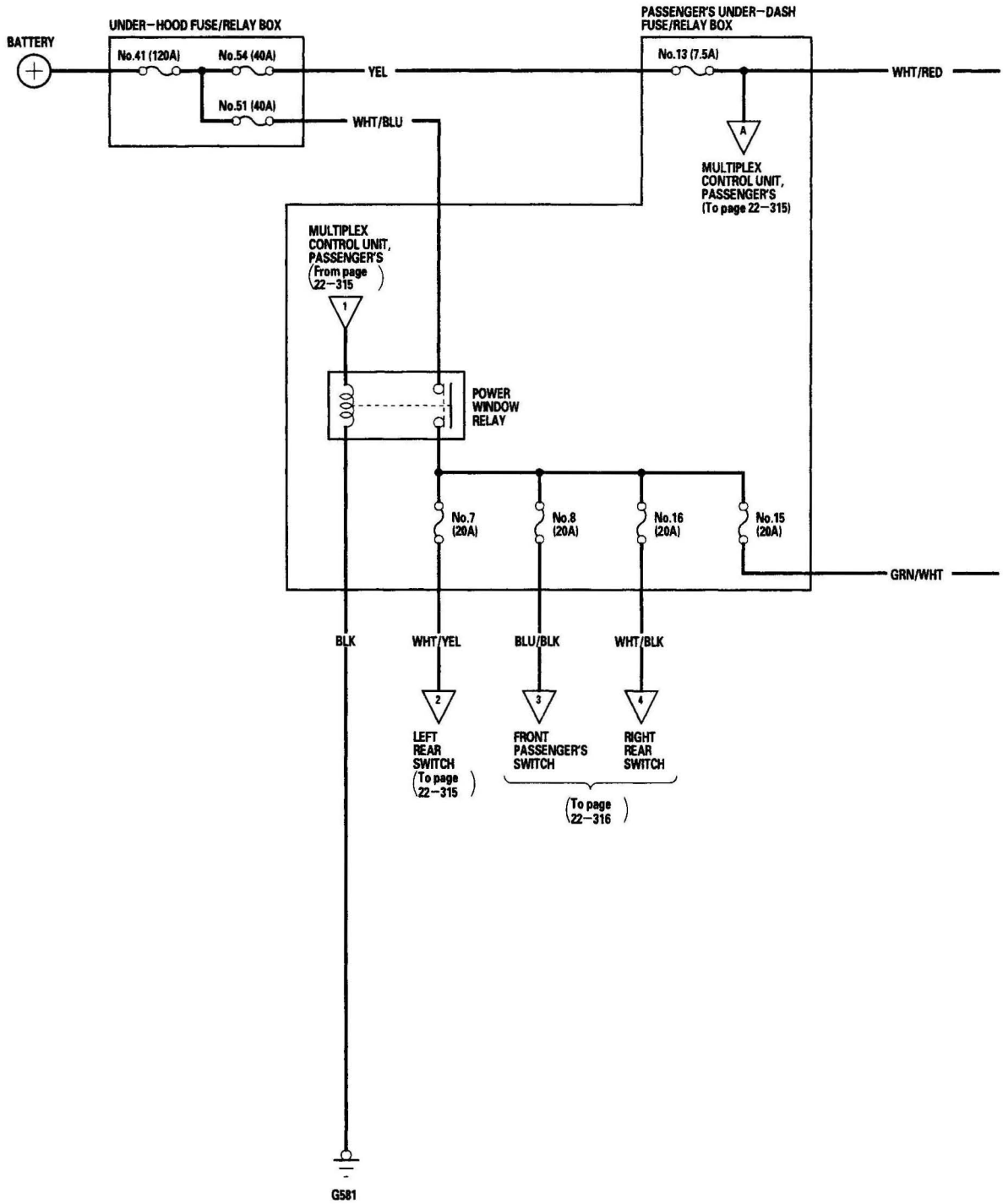
Circuit Diagram (cont'd)



BACK

Protected by AR

'00-01 Models

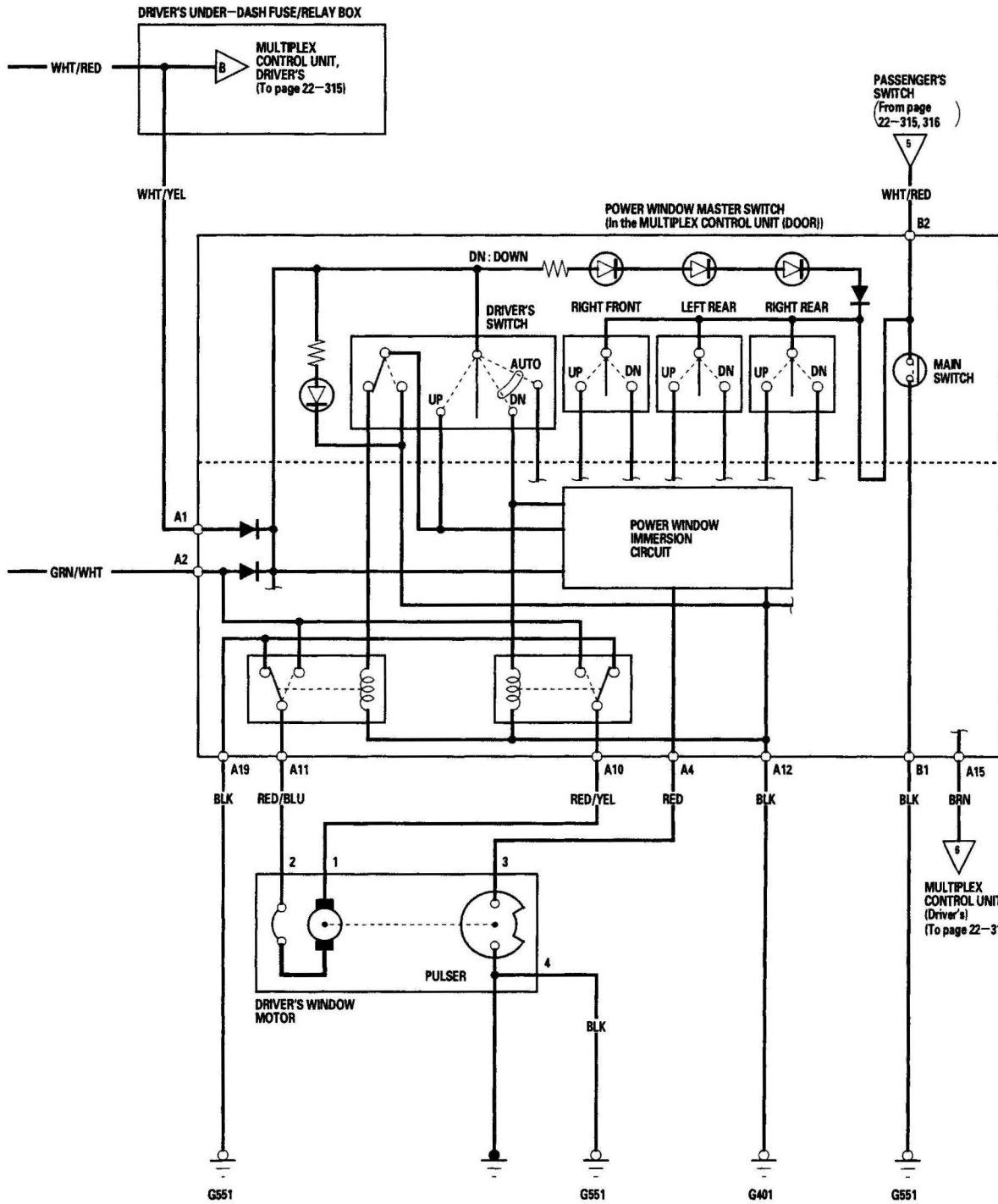


(cont'd)

BACK

Protected by AR

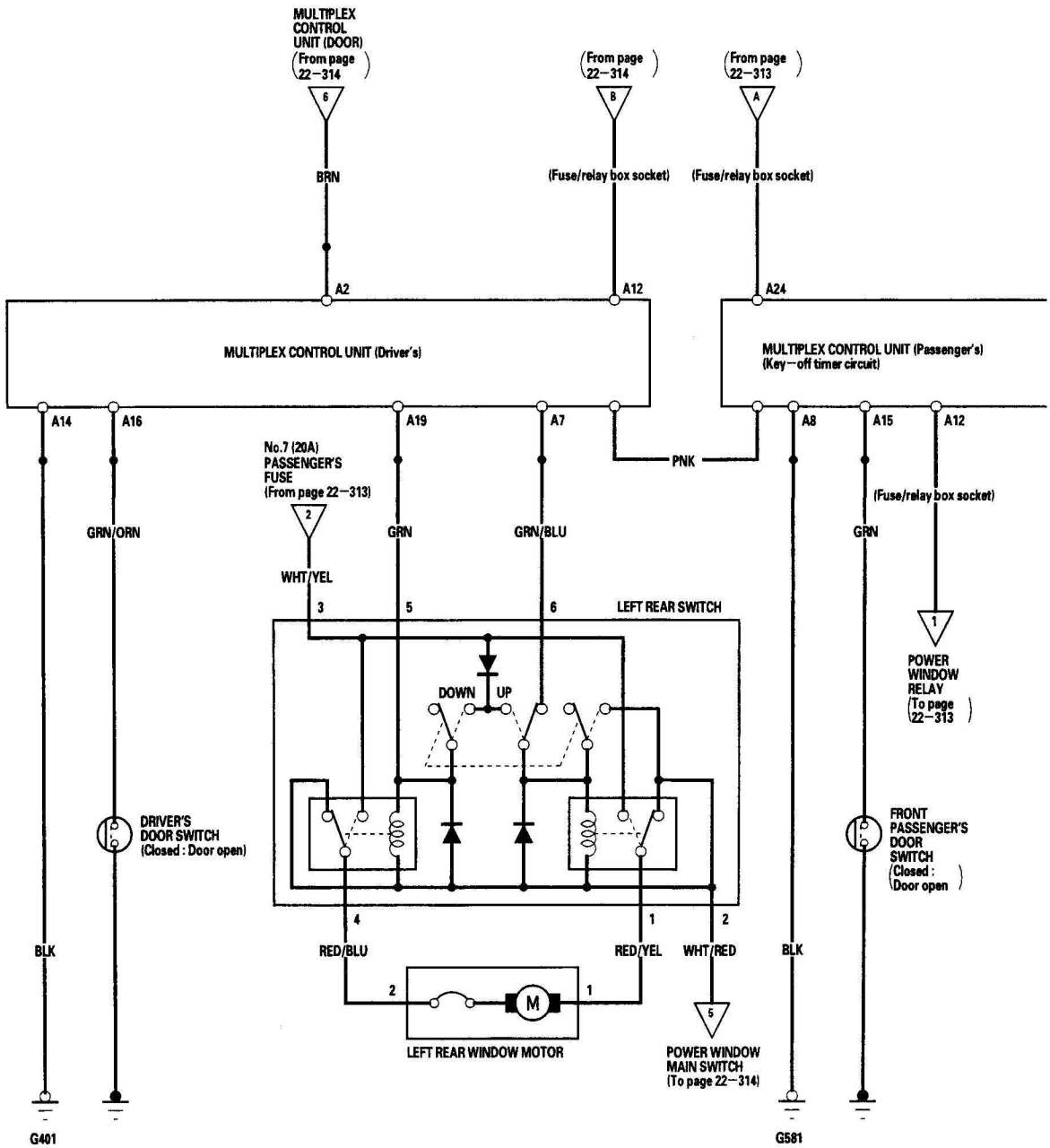
Circuit Diagram (cont'd)



BACK

Protected by AR

'00-01 Models

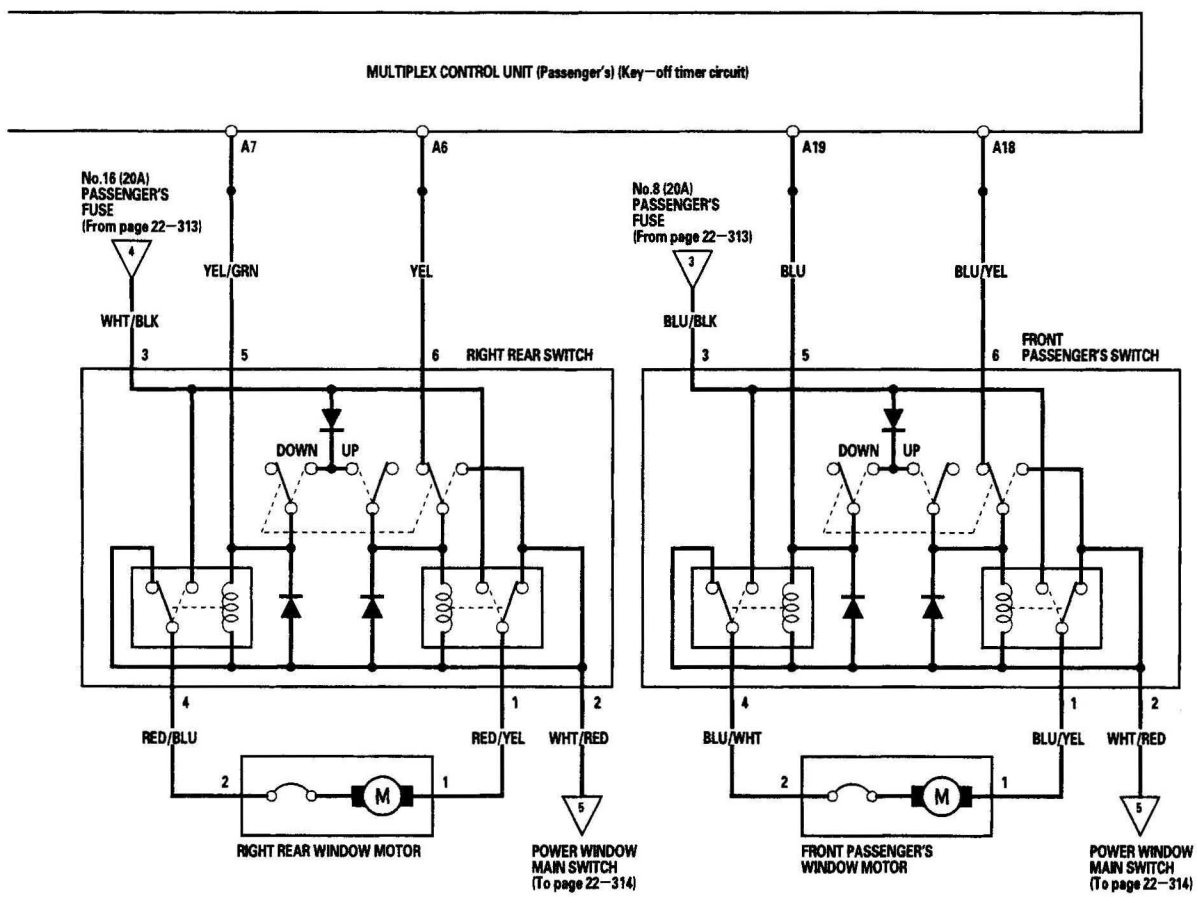


(cont'd)

BACK

Protected by AR

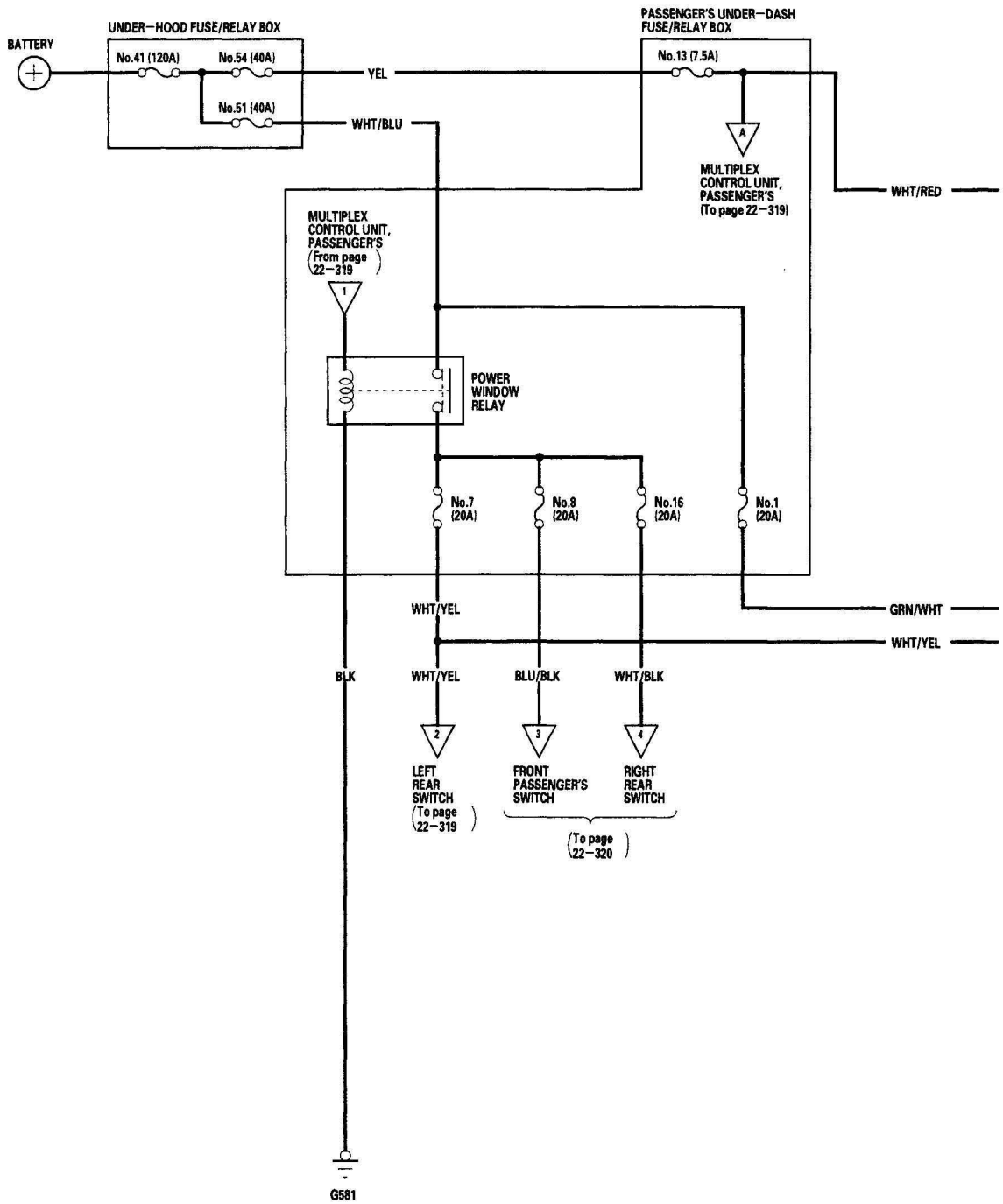
Circuit Diagram (cont'd)



BACK

Protected by AR

'02-03 Models



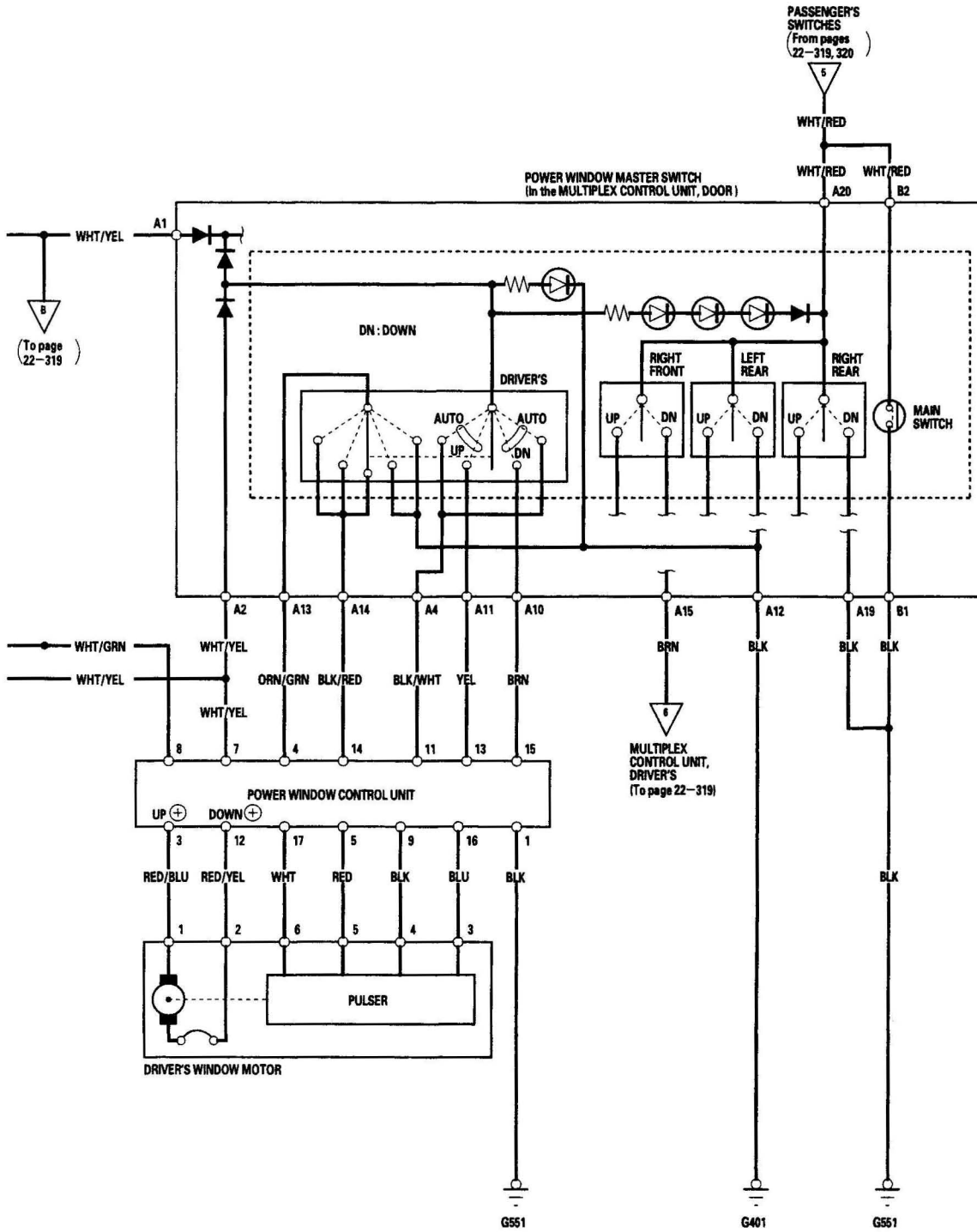
(cont'd)

BACK

Protected by AR

Power Windows

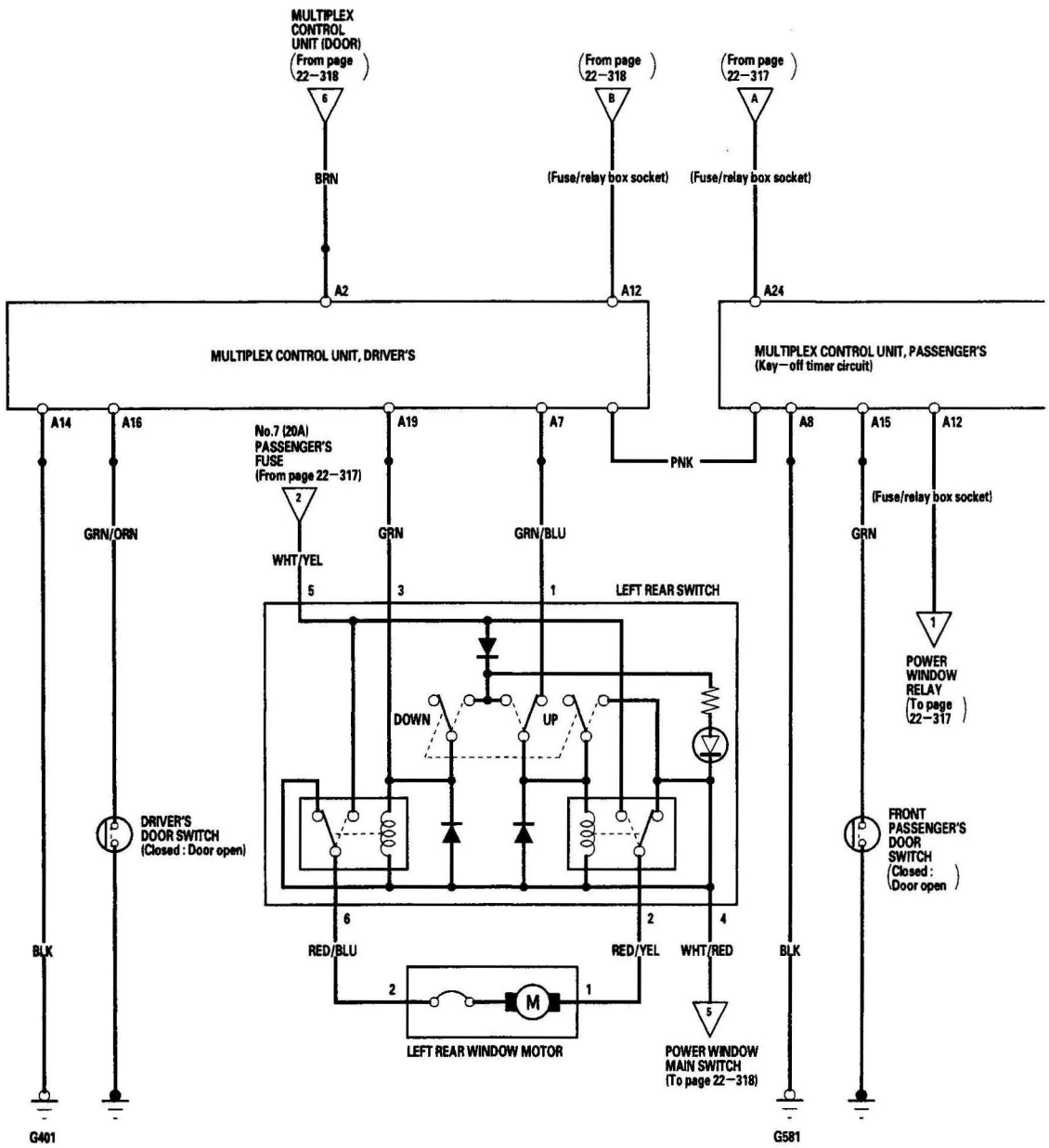
Circuit Diagram (cont'd)



BACK

Protected by AR

'02-03 Models

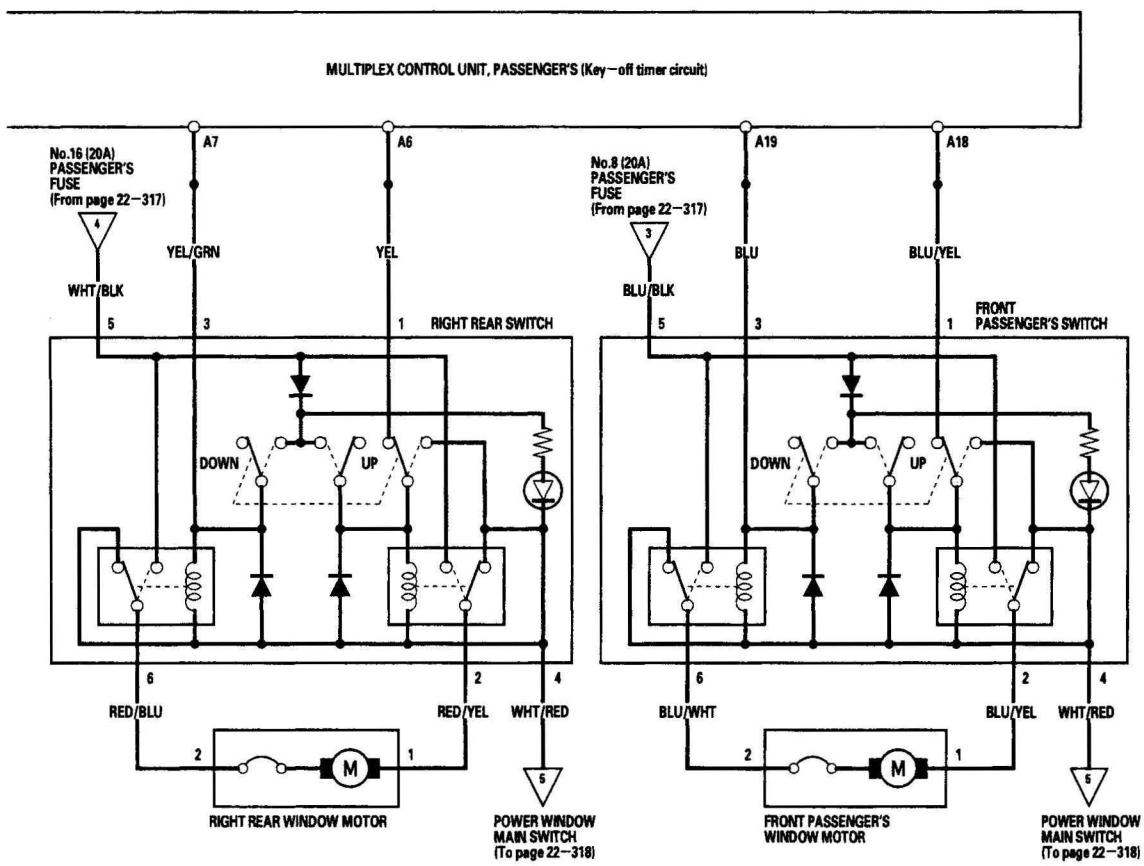


(cont'd)

BACK

Protected by AR

Circuit Diagram (cont'd)



BACK

Protected by AR

Control Unit Input Test

'99-01 Models

1. Before testing the power window control functions, troubleshoot the multiplex control system (see page 22-298).

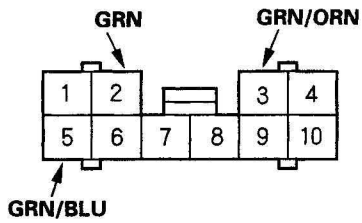
Multiplex Control Unit, Driver's

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.
3. Inspect all connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

DRIVER'S UNDER-DASH FUSE/RELAY BOX SOCKET

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



Wire side of female terminals

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

4. With the driver's multiplex control unit still disconnected, make these input tests at the driver's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
A14			Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the back of the driver's under-dash fuse/relay box.
   For driver's under-dash fuse/relay box connector socket location (see page 22-93).

   - If any test indicates a problem, find and correct the cause then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A2	GRN	Jump A2 to battery voltage	Check the left rear window motor operation: The window should go down.	An open in the wire
A3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground
A5	GRN/BLU	Jump A5 to battery voltage	Check the left rear window motor operation: The window should go up.	An open in the wire

BACK

Protected by AR

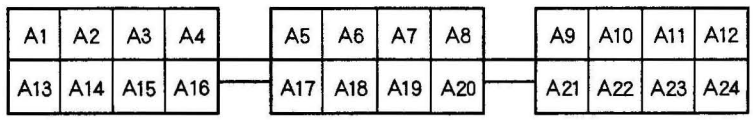
Multiplex Control Unit, Passenger's

6. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

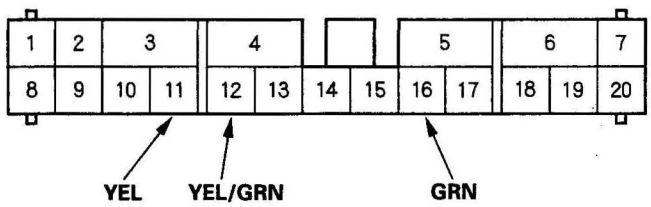
7. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

FUSE/RELAY BOX SOCKET

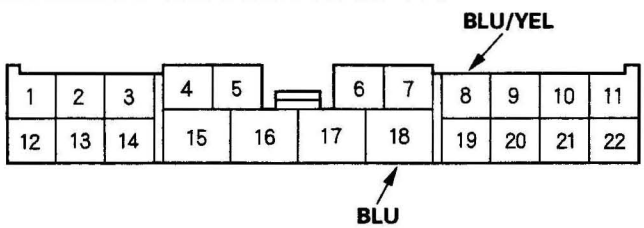


PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR F



Wire side of female terminels

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

8. With the passenger's multiplex control unit still disconnected, make these input tests at the passenger's under-dash fuse/relay box socket.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 9.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A24	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's under-dash fuse/relay box
A12	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	• Faulty power window relay Poor ground (G581) • An open in the wire
A8	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G581) • An open in the wire

9. Reconnect the passenger's multiplex control unit to the passenger's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the passenger's under-dash fuse/relay box.
   For passenger's under-dash fuse/relay box connector socket location (see page 22-94).

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 10.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A16	GRN	Front passenger's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty front passenger's door switch • An open in the wire
		Front passenger's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door switch • Short to ground
F18	BLU	Jump F18 to battery voltage	Check the front passenger's window motor operation: The window should go down.	• Faulty front passenger switch • An open in the wire • Faulty window motor
F9	BLU/YEL	Jump F9 to battery voltage	Check the front passenger's window motor operation: The window should go up.	• Faulty front passenger switch • An open in the wire • Faulty window motor
A12	YEL/GRN	Jump A12 to battery voltage	Check the right rear window motor operation: The window should go down.	• Faulty right rear switch • An open in the wire • Faulty window motor
A11	YEL	Jump A11 to battery voltage	Check the right rear window motor operation: The window should go up.	• Faulty right rear switch • An open in the wire • Faulty window motor

BACK

Protected by AR

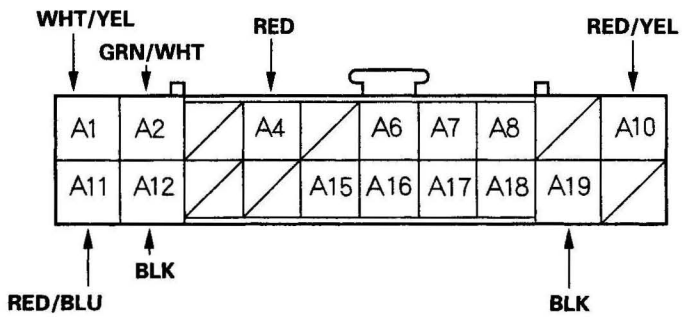
Multiplex Control Unit, Door:

10. Remove the door multiplex control unit from the driver's door, and disconnect its connectors.

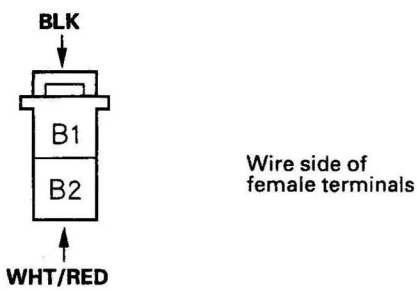
11. Inspect the connector and socket terminals to be sure they are all making good contact.

    - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
    - If the terminals look OK, go to step 12.

MULTIPLEX CONTROL UNIT, DOOR CONNECTOR A



MULTIPLEX CONTROL UNIT, DOOR CONNECTOR B



(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

12. With the door multiplex control unit still disconnected, make these input tests at the connectors.

    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input test prove OK, go to step 13.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
A2	GRN/WHT	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 15 (20A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
A12 A19 B1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401, G551) • An open in the wire
A11 A10	RED/BLU RED/YEL	Connect the A10 terminal to the A12 terminal, and the A11 terminal to the A1 terminal.	Check the driver's window motor operation: The window should go up. NOTE: If the window is up, jump A11 to A12, and A10 to A1; the window should go down.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • Faulty driver's window motor • An open in the wire

13. Reconnect the door multiplex control unit and perform the following input test.

    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, go to step 14.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A4	RED	While operating the driver's window switch with the ignition switch ON (II)	Check for the voltage on the A4 and A12 terminals: About 6 V should be indicated as the driver's window motor runs.	• Faulty pulser • Faulty driver's window motor • An open in the wire • A short to ground in the wire
B2	WHT/RED	Operating any passenger's switch with master main switch OFF, and the ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Poor ground (G401, G581) • Faulty passenger's switch • An open in the wire

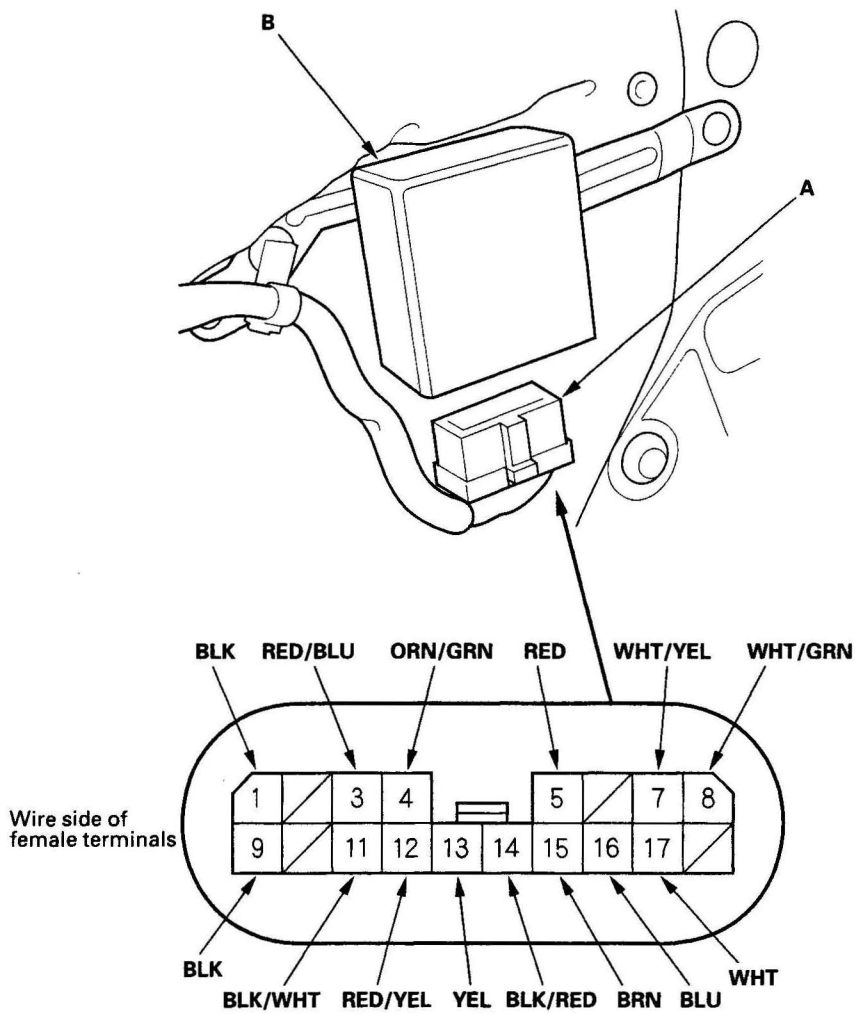
14. If all the input tests prove OK, one of the control units must be faulty. Substitute a known-good control unit for the one that is most likely at fault, then check the system. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely unit to be at fault, and recheck. If the system works properly, the original unit is faulty; replace it.

BACK

Protected by AR

'02-03 Models

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 18P connector (A) from the power window control unit (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

4. With the connetor still disconnected, make these input tests at the connectors.

- If any test indicates a problem, find and correct, then recheck the system.
- If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G551) • An open in the wire
8	WHT/GRN	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 1 (20A) fuse in the driver's under-dash fuse/relay box • An open in the wire
7	WHT/YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 7 (20A) fuse in the passenger's under-dash fuse/relay box • Faulty power window relay • An open in the wire
13	YEL	Ignition switch ON (II) and driver's window switch UP	Check for voltage to ground: There should be battery voltage.	• Faulty power window master switch • An open in the wire
11	BLK/WHT	Ignition switch ON (II) and driver's window switch AUTO UP		
		Ignition switch ON (II) and driver's window switch AUTO DOWN		
15	BRN	Ignition switch ON (II) and driver's window switch DOWN		
4	ORN/GRN	Driver's window switch DOWN	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • Faulty power window master switch • An open in the wire
4 14	ORN/GRN BLK/RED	Driver's window switch OFF	Check for continuity between the No. 4 and No. 14 terminals: There should be continuity.	• Faulty power window master switch • An open in the wire
3	RED/BLU	Connect the battery power to the No. 12 (+) and ground the No. 3 (−) terminals.	Check for driver's window motor: It should run (the window moves down).	• Faulty power window motor • An open in the wire
12	RED/YEL	Connect the battery power to the No. 3 (+) and ground the No. 12 (−) terminals.	Check for driver's window motor: It should run (the window moves up).	• Faulty power window motor • An open in the wire

BACK

Protected by AR

5. Reconnect the 18P connector to the power window control unit, and make these input tests at the connector.

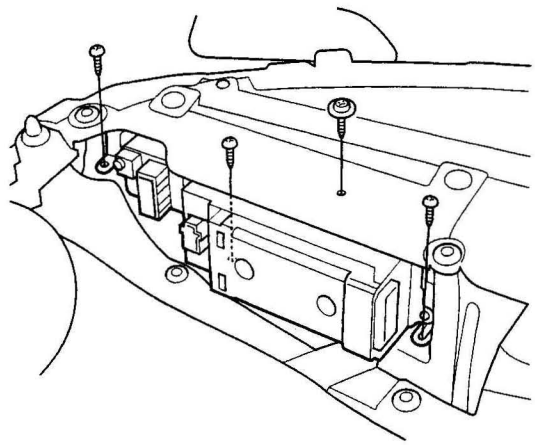
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the control unit must be faulty; replace it.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
17	WHT	Ignition switch ON (II)	Check for voltage between the No. 17 (+) and No. 9 (−) terminals: There should be battery voltage.	• Faulty power window motor • Faulty pulser • An open in the wire
9	BLK			
5	RED	While operating the driver's window switch	Check for voltage between the No. 5 (+) and No. 9 (−) terminals: There should be pulse voltage (an analog voltmeter needle should move back and forth alternately; a digital voltmeter should show the average voltage between 0−5 V).	
16	BLU	While operating the driver's window switch	Check for voltage between the No. 16 (+) and No. 9 (−) terminals: There should be pulse voltage (an analog voltmeter needle should move back and forth alternately; a digital voltmeter should show the average voltage between 0−5 V).	

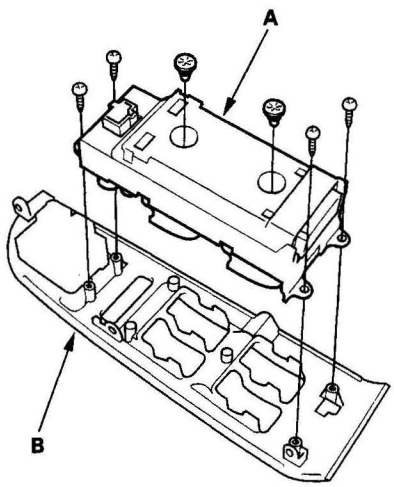
Protected by AR

Master Switch Replacement

1. Remove the driver's door panel (see page 20-6).
2. Remove the screws and master switch assembly.



3. Remove the four mounting screws, then remove the master switch (A) from the panel (B).

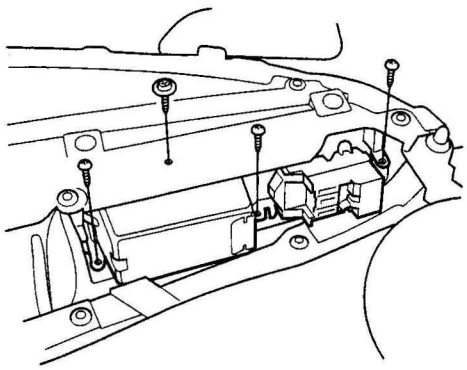


BACK

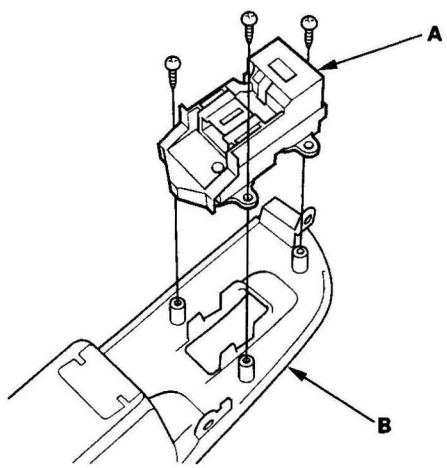
Protected by AR

Passenger's Window Switch Test/Replacement

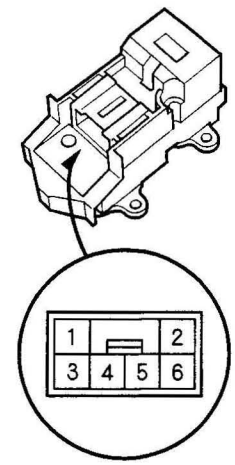
1. Remove the passenger's door panel (see page 20-6).
2. Remove the screws and passenger's switch assembly.



3. Remove the three mounting screws, then remove the passenger's switch (A) from the panel (B).



4. Check for continuity between the terminals in each switch position according to the table.



Terminal / Position	1	2	3	4	5	6
UP	○—○		○—○	○—○	○—○	○—○
OFF	○		○	○	○	○
DOWN	○	○—○	○	○—○		○—○

5. If the continuity is not as specified, replace the switch.

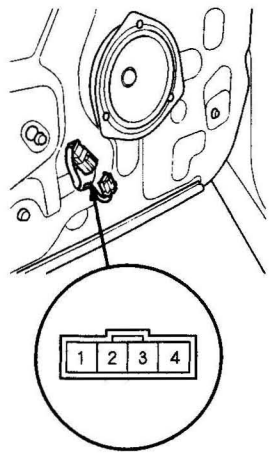
BACK

Protected by AR

Driver's Window Motor Test

Motor Test ('99-01 Models)

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 4P connector from the window motor.



Terminal side of male terminals

3. Test the motor in each direction by connecting battery power and ground according to the table.

⚠CAUTION

When the motor stops running, disconnect one lead immediately.

Terminal / Direction	1	2
UP	⊖	⊕
DOWN	⊕	⊖

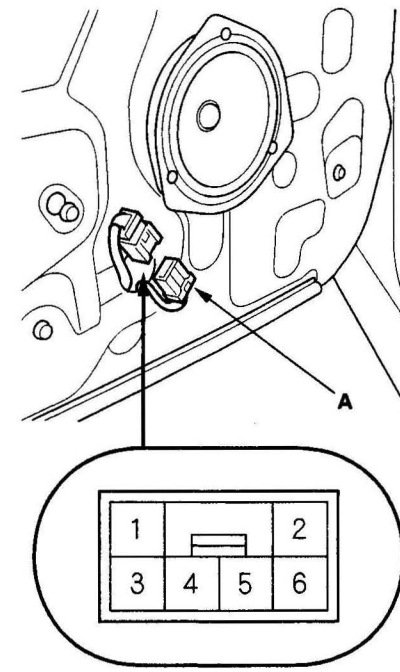
4. If the motor does not run or fails to run smoothly, replace it.

Pulser Test:

5. Connect the test leads of an analog ohmmeter to the No. 3 and No. 4 terminals.
6. Run the motor by connecting power and ground to the No. 1 and No. 2 terminals. The ohmmeter needle should move back and forth alternately.
7. If the needle does not move back and forth, replace the motor.

Motor Test ('02-03 Models)

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 6P connector (A) from the window motor.



Terminal side of male terminals

3. Test the motor in each direction by connecting battery power and ground according to the table.

⚠CAUTION

When the motor stops running, disconnect one lead immediately.

Terminal / Direction	1	2
UP	⊕	⊖
DOWN	⊖	⊕

4. If the motor does not run or fails to run smoothly, replace it.

BACK

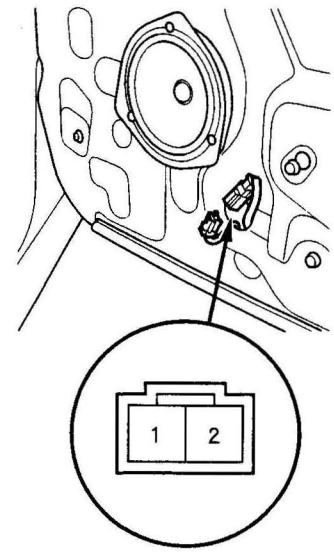
Protected by AR

Pulser Test:

5. Reconnect the 6P connector to the window motor.
6. Check for voltage between the terminals.
   - There should be battery voltage between the No. 6 (+) and No. 4 (−) terminals when the ignition switch ON (II).
   - Connect an analog voltmeter between the No. 5 (+) and No. 4 (−) terminals, and run the window motor at down or up. The voltmeter needle should move back and forth alternately (a digital voltmeter should show the average voltage between 0−5 V).
   - Connect an analog voltmeter between the No. 3 (+) and No. 4 (−) terminals, and run the window motor at down or up. The voltmeter needle should move back and forth alternately.
7. If there is no battery voltage or the needle does not move back and forth, replace the motor.

Passenger's Window Motor Test

1. Remove the passenger's door panel (see page 20-6).
2. Disconnect the 2P connector from the window motor.



Terminal side of male terminals

3. Test the motor by connecting battery power and ground according to the table. When the motor stops running, disconnect one lead immediately.

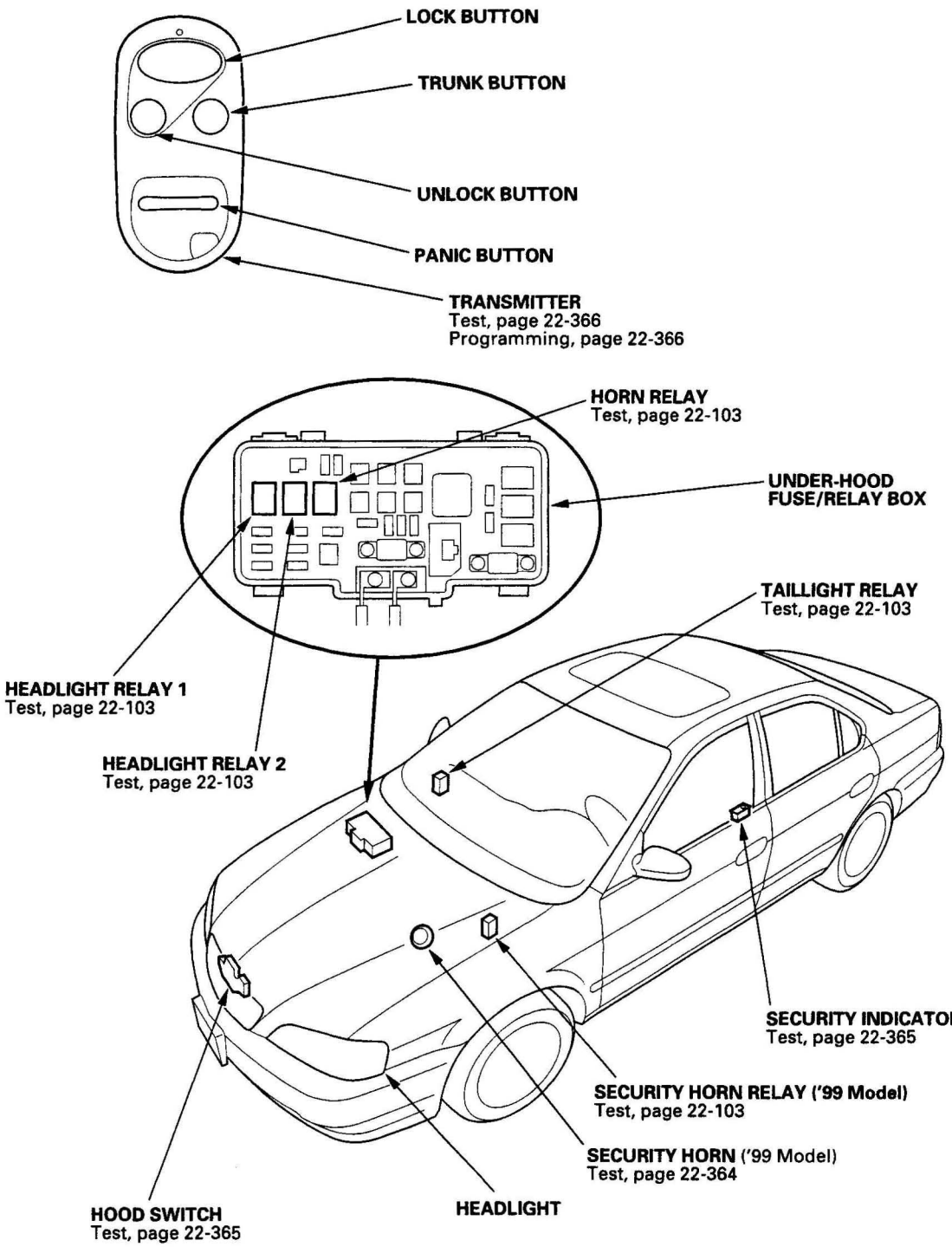
Terminal / Direction	1	2
UP	⊕	⊖
DOWN	⊖	⊕

4. If the motor does not run or fails to run smoothly, replace it.

Protected by AR

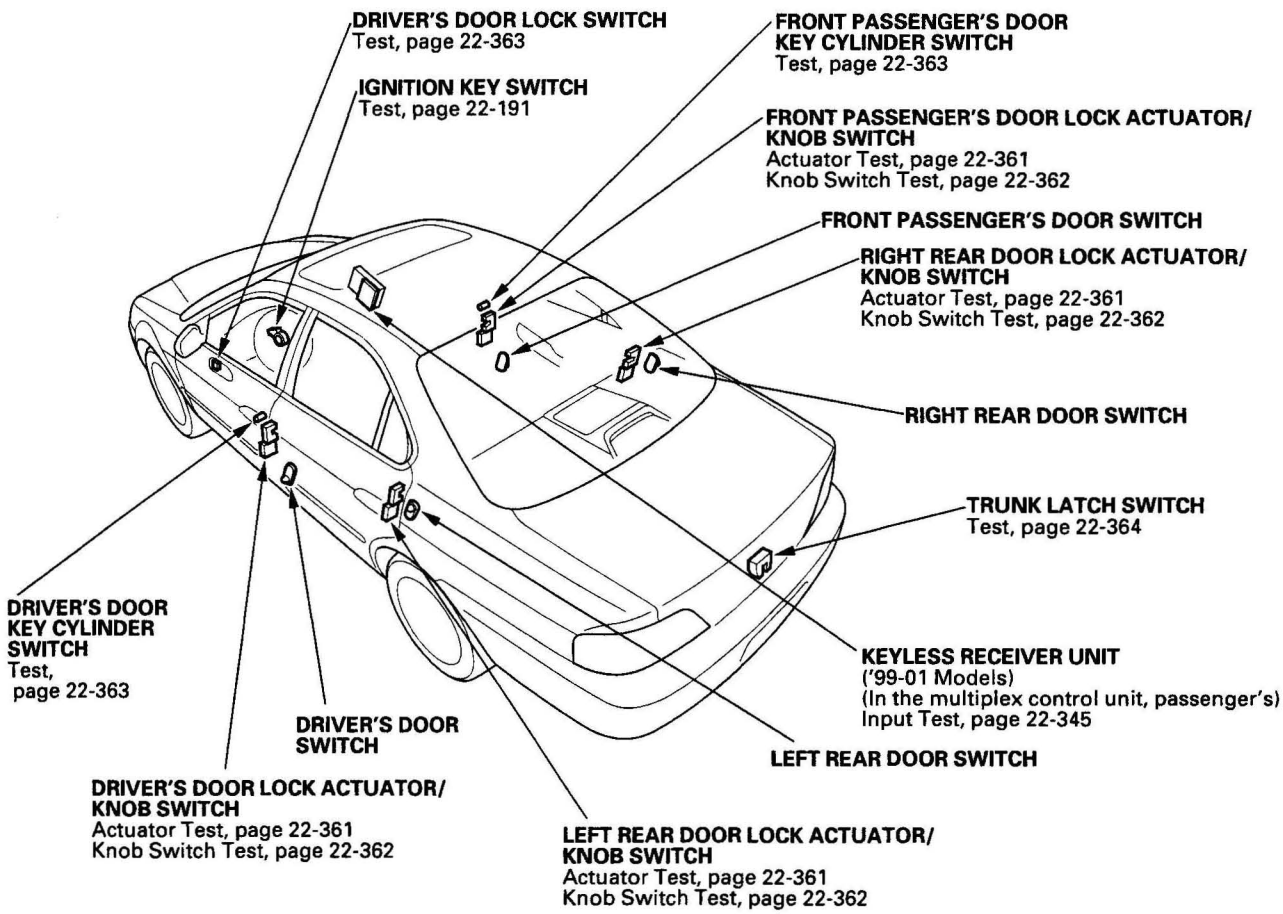
Keyless Entry/Security Alarm System

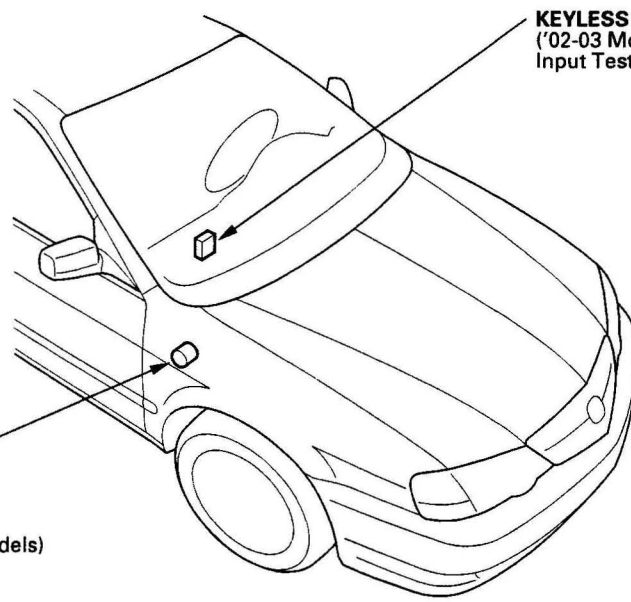
Component Location Index



BACK

Protected by AR





BACK

Protected by AR

System Description

Security Alarm System

The security alarm system is armed automatically after the doors, hood, and trunk lid are closed and locked. For the system to arm, the ignition switch must be off and the key removed, and the security control unit must receive signals that the doors, hood, and trunk lid are closed and locked. The alarm can be disarmed at any time by unlocking either door with the key or the remote transmitter.

When everything is closed and locked, none of the control unit inputs are grounded (switches open). Fifteen seconds after the doors are locked with the key, the driver's lock knob, or the remote transmitter, the system arms. The security indicator on the driver's door panel flashes immediately after everything is closed and locked.

If one of the switches is misadjusted or there is a short in the system, the system will not arm. As long as the control unit continues to receive a ground signal, it senses that the vehicle is not closed and locked, and it will not arm. Conversely, a switch that is slightly misadjusted can sound an alarm for no apparent reason. In this case, it may only take a significant change in outside temperature, the vibration of a passing truck, or someone bumping into the vehicle to make the alarm sound.

If anything is opened or improperly unlocked after the system is armed, the control unit receives a ground signal from that switch. The system sounds the alarm when any of these things occur:

- A door is forced open
- A door is unlocked without using the key or the remote transmitter
- The hood is opened
- The trunk lid is opened without using the remote transmitter
- The audio unit is removed

When the system sound the alarm because of one of these violations, the security horn sounds and the headlight (low beam), parking lights, taillights, and side marker lights flash for 120 seconds. The alarm then shuts off and the system rearms. The alarm can be stopped at any time by unlocking either door with the key or the remote transmtter.

Panic Mode

The panic mode allows the security system to be set off by the remote transmitter to attract attention. When you push and hold the PANIC button for about two seconds, the alarm will sound and the exterior lights will flash for about 30 seconds.
To immediately cancel the panic mode, press any button on the remote transmitter, or turn the ignition switch ON (II). The panic mode will not function if the key is in the ignition switch.

Keyless Entry System

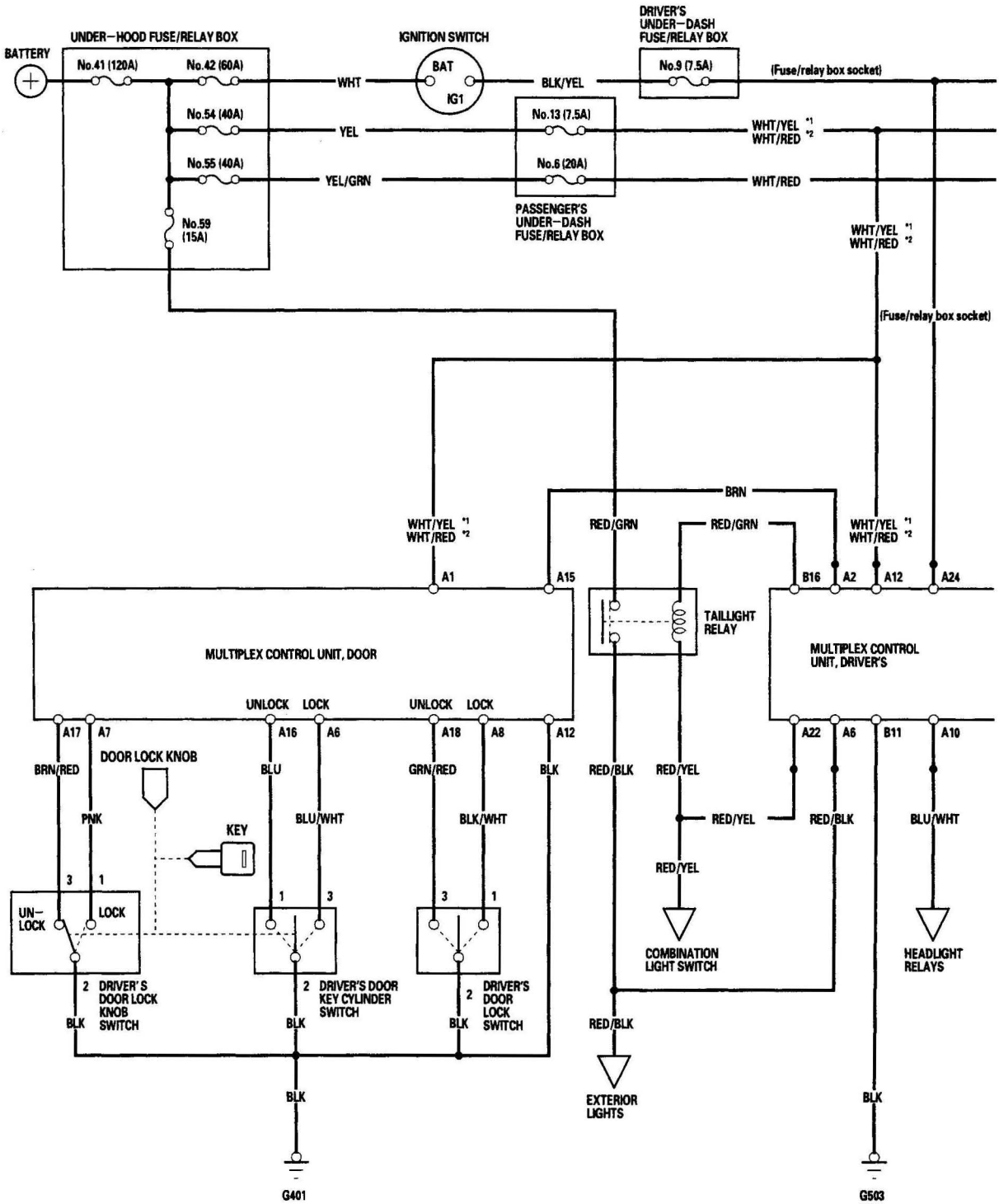
The security alarm system receives lock (arm), unlock (disarm) and panic signals from the keyless entry control unit. The keyless entry system allows you to lock and unlock the vehicle with the remote transmitter. When you push the LOCK button, all doors lock. When you push the UNLOCK button once, only the driver's door unlocks. The passenger's door will unlock when you push the button a second time.
The two keyless remote transmitters also activate the Driving Position Memory System (DPMS). Each transmitter is coded to send either the Memory 1 or Memory 2 signal to the DPMS control unit. The code is marked on the rear of each remote transmitter.
The feature can be turned off by pressing the LOCK and UNLOCK buttons on the transmitter at the same time, and waiting for the LED on transmitter to blink twice. To turn the feature back on, press and hold the LOCK and UNLOCK buttons at the same time, and the LED will blink once.
The ceiling light, if its switch is in the center position, will come on when you press the UNLOCK button. If you do not open a door, the light will go off in about 30 seconds, the doors will automatically relock, and the security system will rearm. If you relock the doors with the remote transmitter within 30 seconds, the light will go off immediately.
You cannot lock or unlock the doors with the remote transmitter if a door is not fully closed, or if the key is in the ignition switch. If the trunk or hood is not closed, the doors will lock and unlock, but the security system will not be armed until the trunk lid and hood are closed.
To open the trunk lid, push the Trunk Release button and hold it for about two seconds. The trunk lid will not open if the key is in the ignition switch.
The system will signal you when the doors lock and unlock by flashing the parking lights, side marker lights, and taillights: once when they lock, and twice when they unlock.
When you press the LOCK button a second time within 5 seconds after you have locked the doors, the horn will sound once to verify that the security system will be set.

BACK

Protected by AR

Circuit Diagram

'99-01 Models

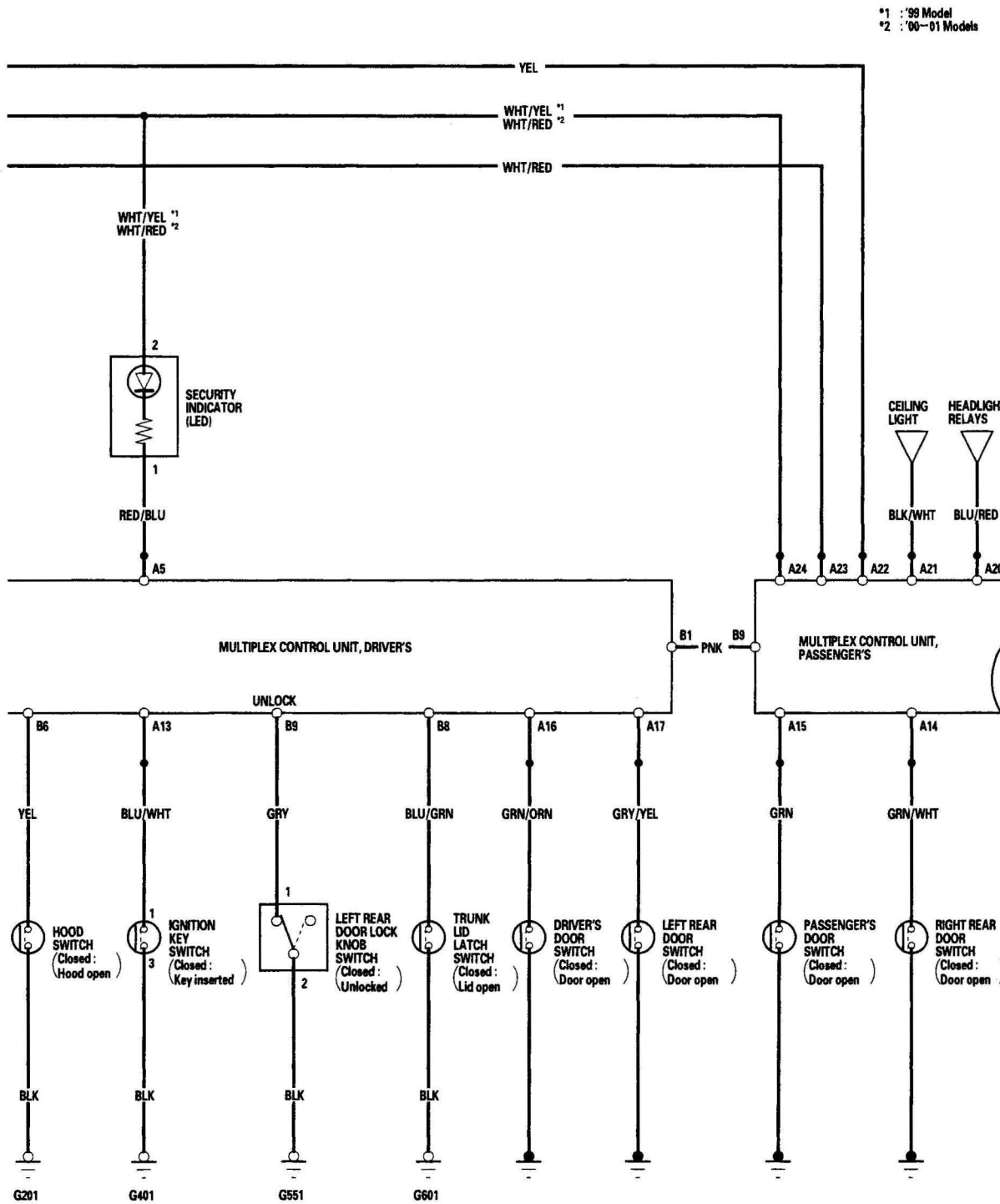


(cont'd)

BACK

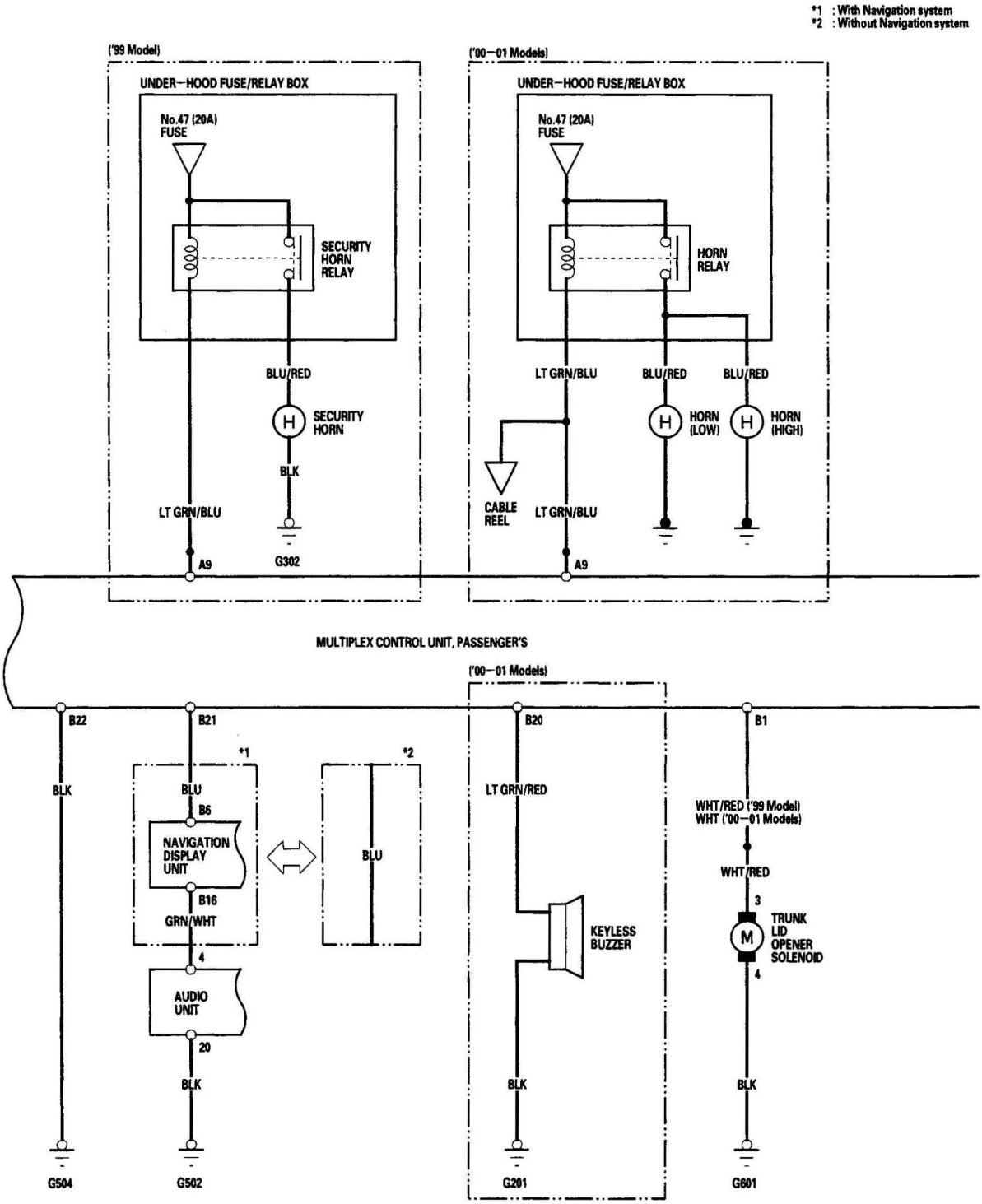
Protected by AR

Circuit Diagram (cont'd)



BACK

Protected by AR

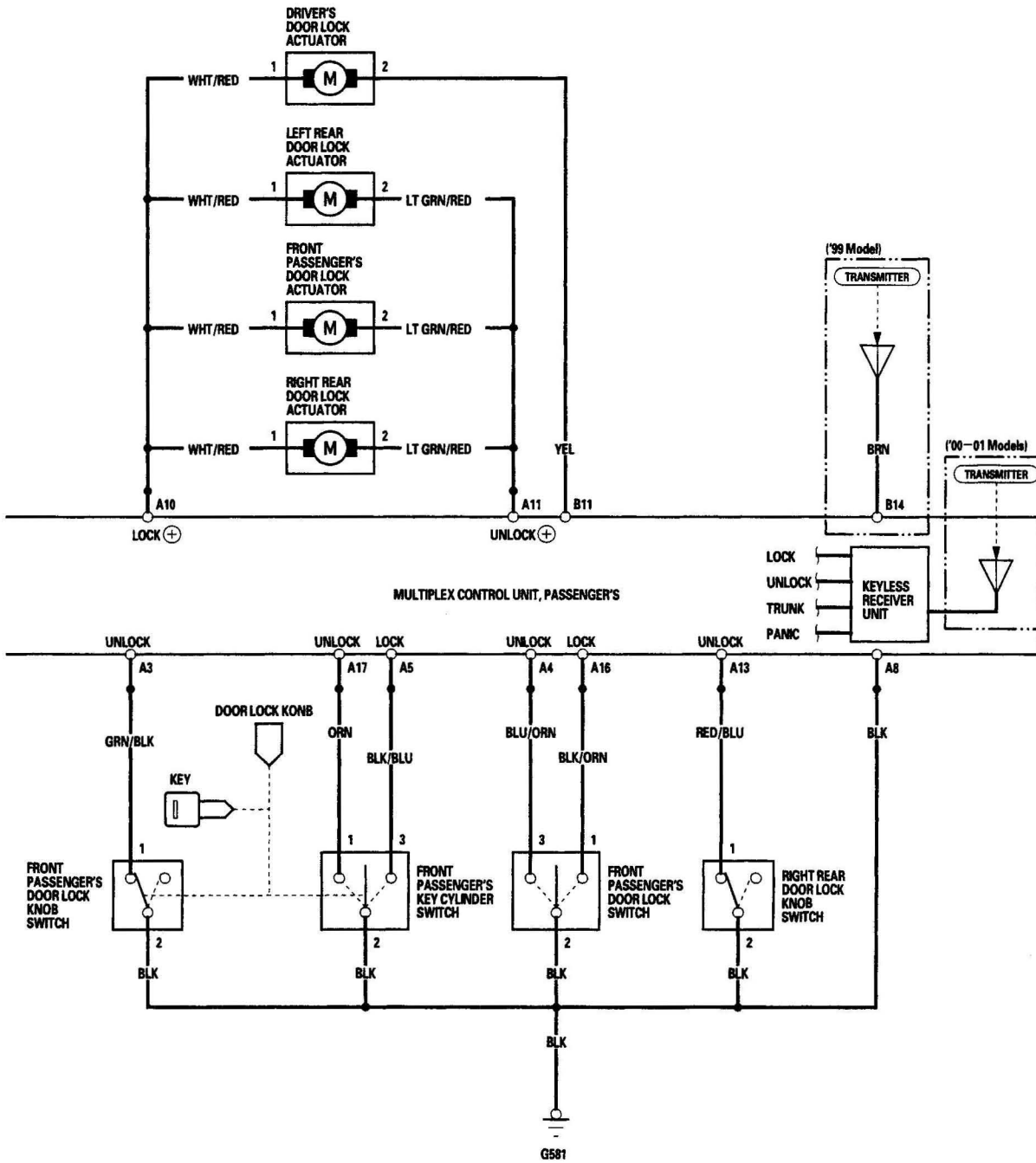


(cont'd)

BACK

Protected by AR

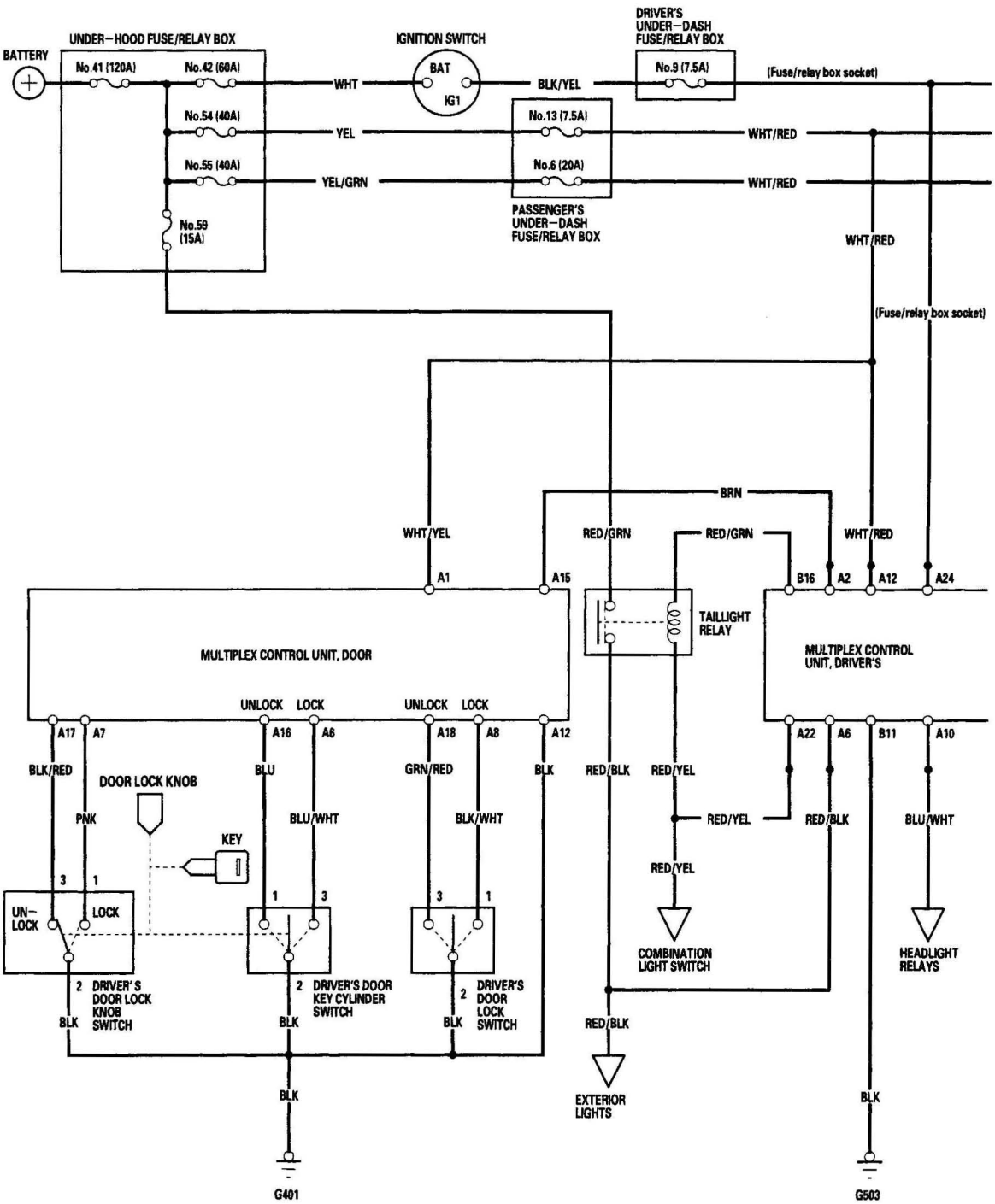
Circuit Diagram (cont'd)



BACK

Protected by AR

'02-03 Models



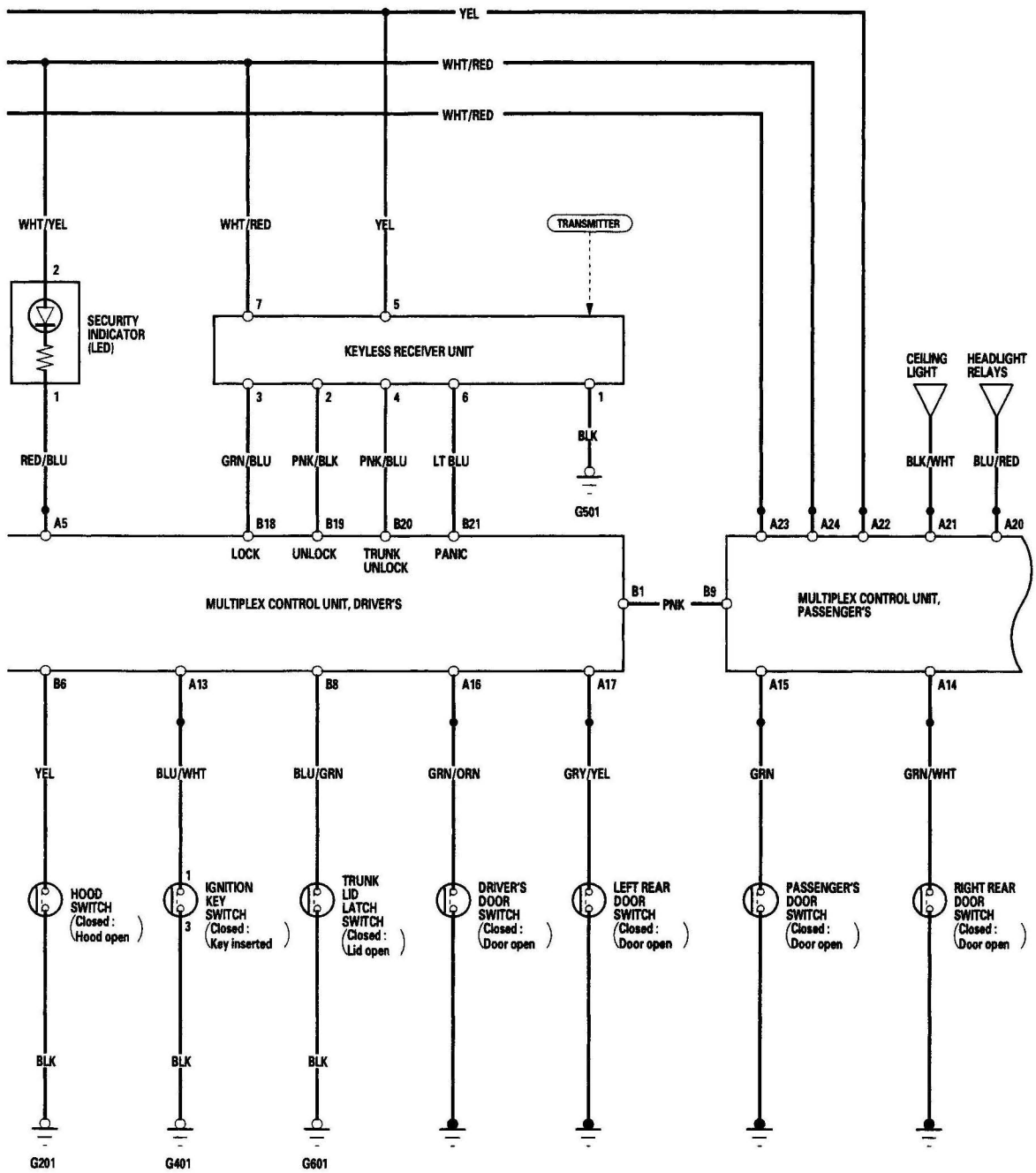
(cont'd)

BACK

Protected by AR

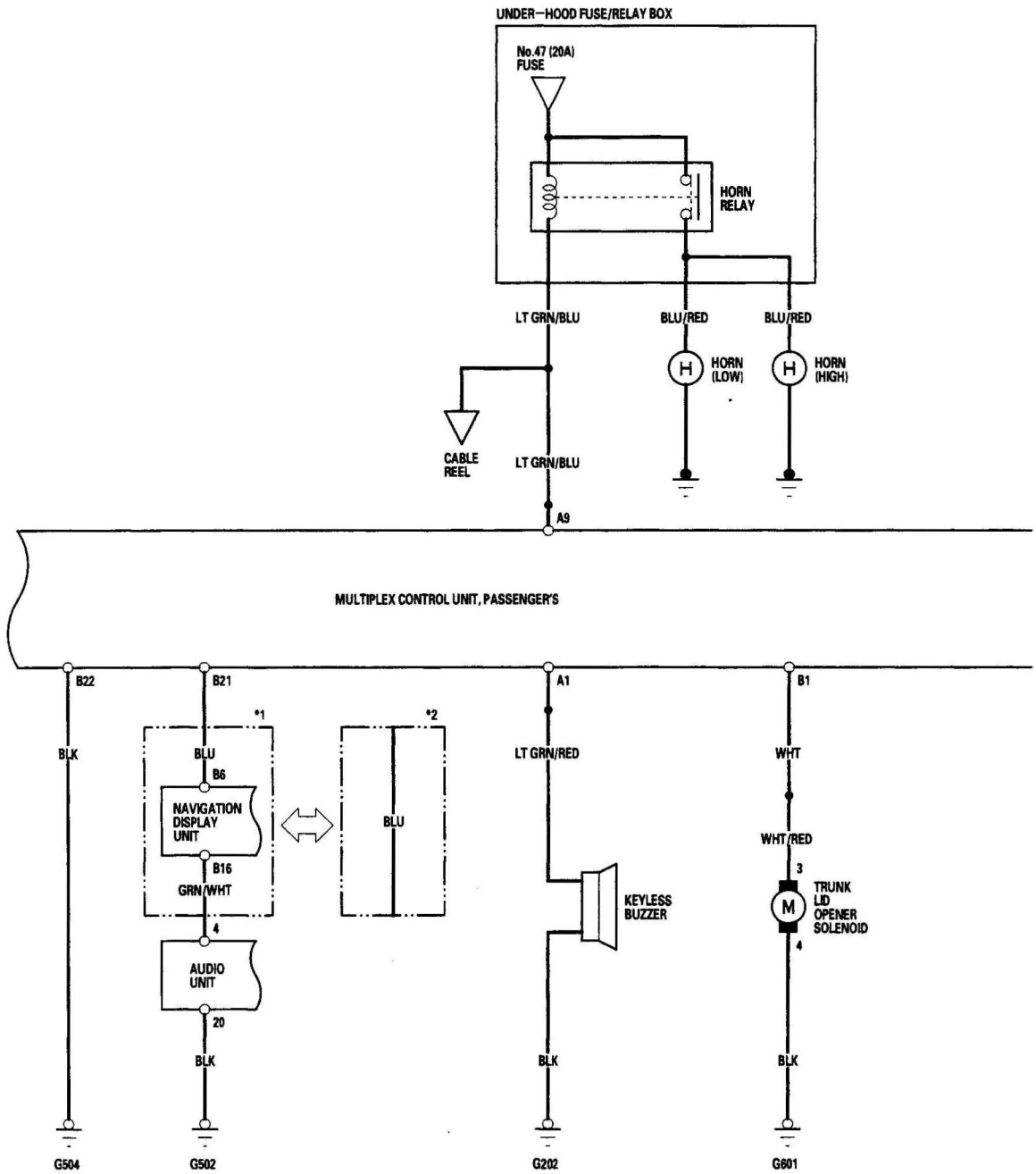
Keyless Entry/Security Alarm System

Circuit Diagram (cont'd)



BACK

Protected by AR



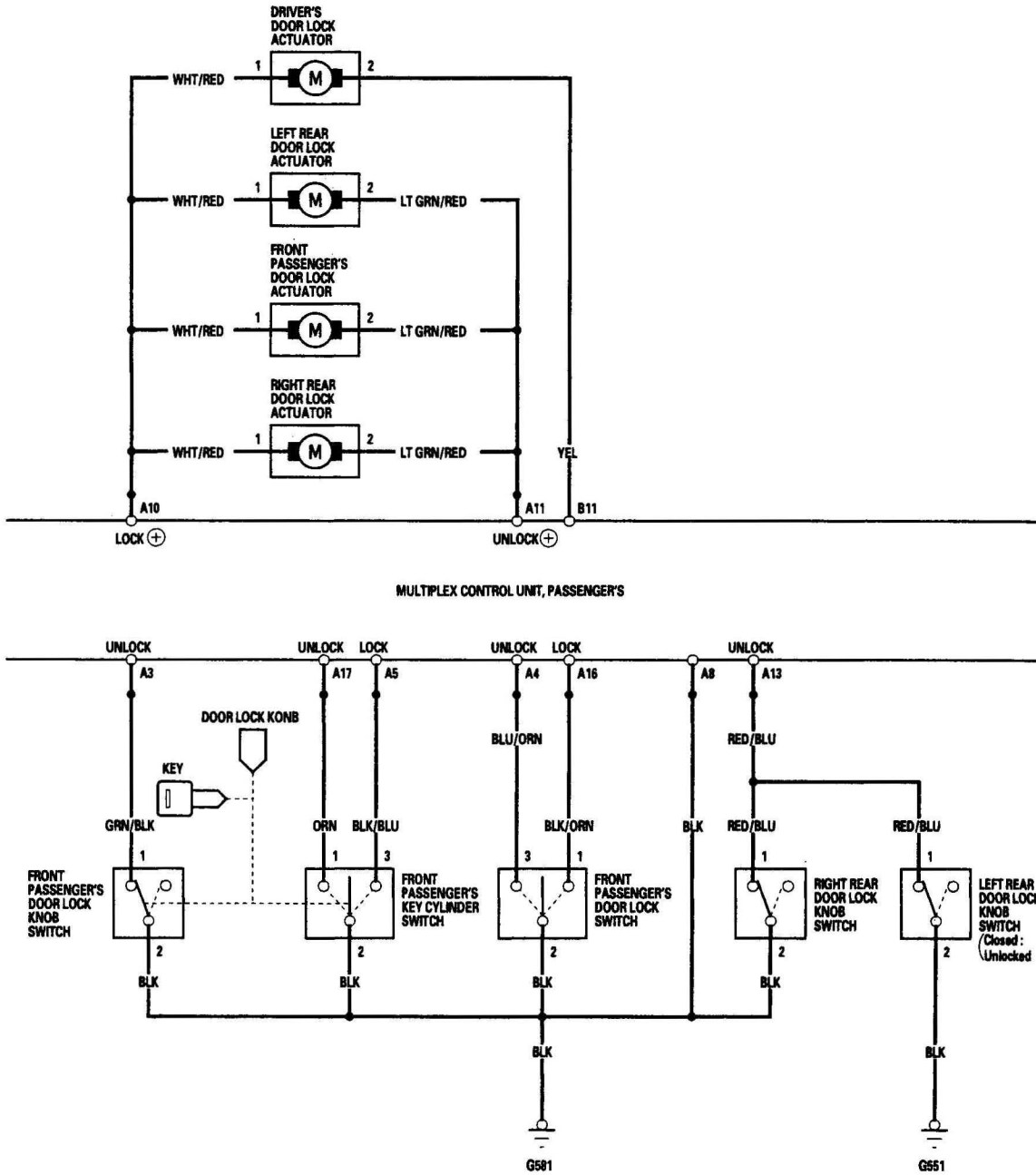
(cont'd)

BACK

Protected by AR

Circuit Diagram (cont'd)

*1 : With Navigation system
*2 : Without Navigation system



BACK

Protected by AR

Control Unit Input Test

'99-01 Models

1. Before testing the keyless entry/security control functions, troubleshoot the multiplex control system (see page 22-298).

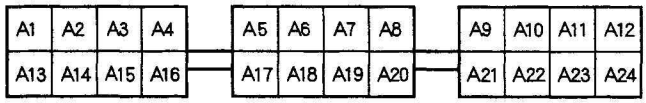
Multiplex Control Unit, Driver's

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.

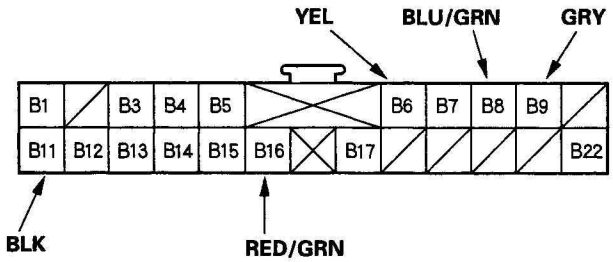
3. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

FUSE/RELAY BOX SOCKET

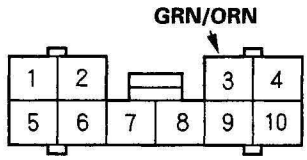


MULTIPLEX CONTROL UNIT, DRIVER'S CONNECTOR B



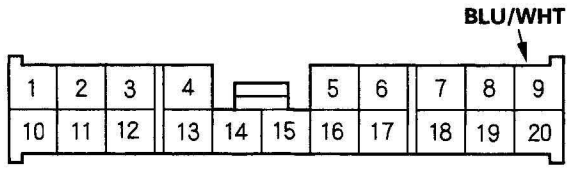
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR O



Wire side of female terminals

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

4. With the driver's multiplex control unit still disconnected, make these input tests at the connector and driver's under-dash fuse/relay box sockets.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • An open in the wire
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box • Faulty driver's fuse/relay box
A10		Headlight switch ON (≣D) and jump A10 to battery voltage	The headlights should come on.	• Poor ground (G401) • Faulty headlight relay 1 or 2 • An open in the wire • Faulty combination light switch
A5		Under all conditions	Attach to ground: The security indicator should come on.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty security indicator • An open in the wire
A22		Combination light switch ON	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • Faulty combination light switch • An open in the wire
		Combination light switch OFF	Check for continuity to ground: There should be no continuity.	
B16	RED/GRN	Combination light switch OFF	Check for continuity to ground: There should be no continuity.	• Faulty taillight relay • Faulty combination light switch • An open in the wire
		Combination light switch ON and jump B16 to battery voltage	The taillights should come on.	

BACK

Protected by AR

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the back of the driver's under-dash fuse/relay box.
For driver's under-dash fuse/relay box connector socket location (see page 22-93).

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
O9	BLU/WHT	Ignition key is in the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition key switch • An open in the wire
		Ignition key is out of the ignition switch	Check for voltage to ground: There should be 5 V or more.	
A3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground
B6	YEL	Hood open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G201) • Faulty hood switch • An open in the wire
		Hood closed	Check for voltage to ground: There should be 5 V or more.	• Faulty hood switch • Short to ground
B8	BLU/GRN	Trunk lid open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G601) • Faulty trunk latch switch • An open in the wire
		Trunk lid closed	Check for voltage to ground: There should be 5 V or more.	• Faulty trunk latch switch • Short to ground
B9	GRY	Left rear door lock knob locked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G551) • Faulty left rear door lock actuator • An open in the wire
		Left rear door lock knob unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty left rear door lock actuator • Short to ground

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

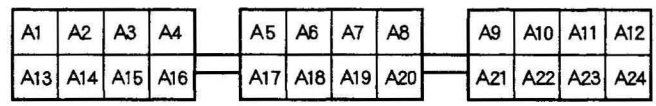
Multiplex Control Unit, Passenger's

6. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

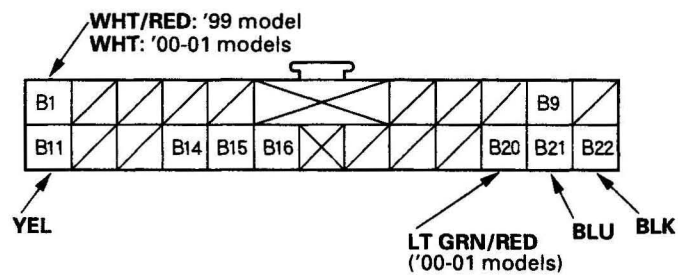
7. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

FUSE/RELAY BOX SOCKET

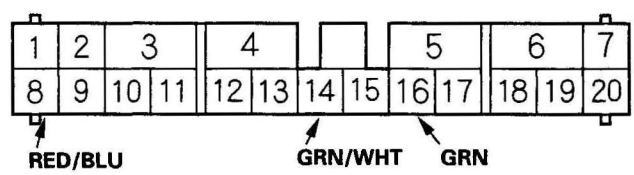


MULTIPLEX CONTROL UNIT, PASSENGER'S CONNECTOR B



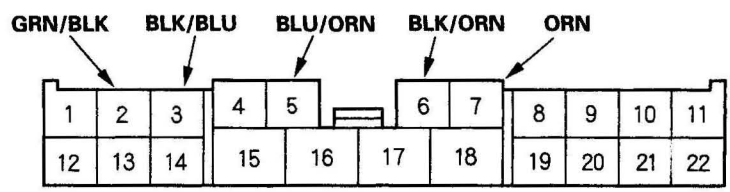
Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR F



Wire side of female terminals

BACK

Protected by AR

8. With the passenger's multiplex control unit still disconnected, make these input tests at the connectors and the passenger's under-dash fuse/relay box sockets.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 9.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G581) • An open in the wire
A9		Under all conditions	Attach to ground: Horn should sound.	• Blown No. 47 (20A) fuse in the under-hood fuse/relay box • Faulty horn relay • Faulty horn • An open in the wire
A20		Under all conditions	Attach to ground: Headlights should come on.	• Faulty headlight relay • An open in the wire
A21		Ceiling light switch in the middle position	Attach to ground: Ceiling light should come on.	• Blown No. 11 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty ceiling light • An open in the wire
A22		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A23		Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (20A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A24		Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's under-dash fuse/relay box
B22	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G504) • An open in the wire
A10	Fuse/relay box socket	Jump A10 to battery voltage, then jump B11 to body ground.	Check driver's door lock operation: The door should lock.	• Faulty passenger's under-dash fuse/relay box • An open in the wire • Faulty driver's actuator
B11	YEL			
A11	Fuse/relay box socket	Jump A10 to battery voltage and A11 to body ground.	All passenger doors should lock.	• Faulty passenger's under-dash fuse/relay box • An open in the wire • Faulty passenger's actuator
B1	WHT/RED ('99 model) WHT ('00-01 models)	Connect the B1 terminal to the A24 terminal momentarily.	Check trunk lid opener operation: Trunk lid should open.	• Poor ground (G601) • Faulty trunk lid opener solenoid • An open in the wire
B20 ('00-01 models)	LT GRN/RED	Connect the B20 terminal to the A24 terminal momentarily.	Check buzzer operation: Buzzer should sound.	• Poor ground (G201) • Faulty keyless buzzer • An open in the wire
B14 ('99 model)	BRN	Under all conditions	Check for continuity between B14 terminal and keyless receiver 1P terminal: There should be continuity.	• An open in the wire
B21	BLU	Under all conditions	Check for voltage to ground: There shoudl be 1 V or less.	• An open in the wire • Poor ground (G501) • Faulty connections at the audio unit or navigation display • Faulty audio unit or navigation display

(cont'd)

BACK

Protected by AR

Control Unit Input Test (cont'd)

9. Reconnect the passenger's multiplex control unit to the passenger's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the passenger's under-dash fuse/relay box.
For passenger's under-dash fuse/relay box connector socket location (see page 22-94).

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 10.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
F2	GRN/BLK	Front passenger's door lock knob unlocked	Check for voltage to ground: There shoudl be 1 V or less.	• Poor ground (G581) • An open in the wire • Faulty front passenger's door lock actuator
		Front passenger's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door lock actuator • Short to ground
F5	BLU/ORN	Front passenger's door lock switch in UNLOCK	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G581) • Faulty front passenger's door lock switch • An open in the wire
		Front passenger's door lock switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door lock switch • Short to ground
F6	BLK/ORN	Front passenger's door lock switch in LOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • Faulty front passenger's door lock switch • An open in the wire
		Front passenger's door lock switch in the neutral position	Check for voltage to ground:There should be 5 V or more.	• Faulty front passenger's door lock switch • Short to ground
F3	BLK/BLU	Front passenger's door lock key cylinder locked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • Faulty front passenger's door lock key cylinder switch • An open in the wire
		Front passenger's door lock key cylinder the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door lock key cylinder switch • Short to ground
F7	ORN	Front passenger's door lock key cylinder unlocked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • Faulty front passenger's door lock key cylinder switch • An open in the wire
		Front passenger's door lock key cylinder the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door lock key cylinder switch • Short to ground
A14	GRN/WHT	Right rear door opened	Check for voltage to ground: There should be 1 V or less.	• Faulty right rear door switch • An open in the wire
		Right rear door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty right rear door switch • Short to ground
A16	GRN	Front passenger's door opened	Check for voltage to ground: There should be 1 V or less.	• Faulty front passenger's door switch • An open in the wire
		Front passenger's door closed	Check for voltage to ground: THere should be 5 V or more.	• Faulty front passenger's door switch • Short to ground
A8	RED/BLU	Right rear door lock knob unlocked	Check for voltage to ground: There shoudl be 1 V or less.	• Poor ground (G581) • Faulty right rear door lock switch • An open in the wire
		Right rear door lock knob locked	Check for voltage to ground: There should be 5 V or more.	• Faulty right rear door lock switch • Short to ground

BACK

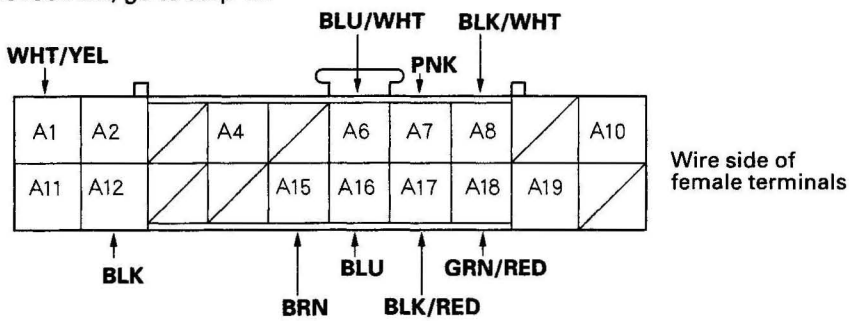
Protected by AR

Multiplex Control Unit, Door

10. Remove the door multiplex control unit, and disconnect its connector.

11. Inspect the connector and socket terminals to be sure they are making good contact

    - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
    - If the terminals look OK, go to step 12.



12. With the door multiplex control unit still disconnected, make these input tests at the connector.

    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, go to step 13.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
A12	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

13. Reconnect the connector to the door multiplex control unit, make these input tests at the connector.

    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, go to step 14.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A6	BLU/WHT	Driver's door key cylinder switch in LOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door key cylinder switch • Poor ground (G401) • An open in the wire
		Driver's door key cylinder switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door key cylinder switch • Short to ground
A16	BLU	Driver's door key cylinder switch in UNLOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door key cylinder switch • Poor ground (G401) • An open in the wire
		Driver's door key cylinder switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door key cylinder switch • Short to ground
A7	PNK	Driver's door lock knob locked	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock actuator • Poor ground (G401) • An open in the wire
		Driver's door lock knob unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock actuator • Short to ground
A17	BLK/RED	Driver's door lock knob unlocked	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock actuator • Poor ground (G401) • An open in the wire
		Driver's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock actuator • Short to ground
A8	BLK/WHT	Driver's door lock switch in LOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock switch • Poor ground (G401) • An open in the wire
		Driver's door lock switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground
A18	GRN/RED	Driver's door lock switch in UNLOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock switch • Poor ground (G401) • An open in the wire
		Driver's door lock switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground

14. If all the input tests prove OK, one of the control units must be faulty, Substitute a known-good control unit for the one that is most likely at fault, then recheck the system. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely unit to be at fault, and recheck. If the system works properly, the original unit is faulty; replace it.

BACK

Protected by AR

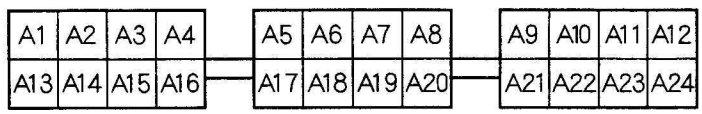
'02-03 Models

1. Before testing the keyless entry/security control functions, troubleshoot the multiplex control system (see page 22-298).

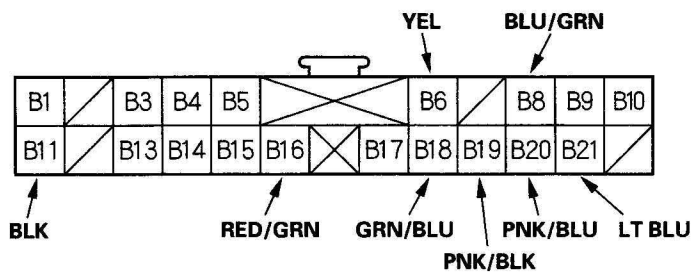
Multiplex Control Unit, Driver's

2. Remove the driver's multiplex control unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

FUSE/RELAY BOX SOCKET

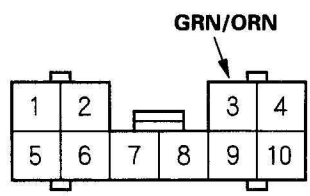


MULTIPLEX CONTROL UNIT, DRIVER'S CONNECTOR B



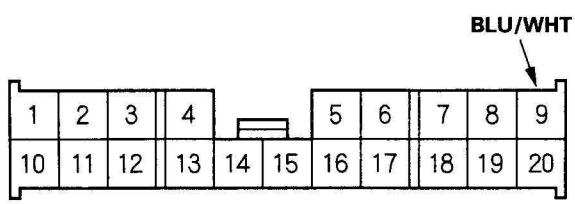
Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



Wire side of female terminals

DRIVER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR O



Wire side of female terminels

(cont'd)

BACK

Protected by AR

Control Unit Input Test (cont'd)

4. With the driver's multiplex control unit still disconnected, make these input tests at the connector and driver's under-dash fuse/relay box sockets.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • An open in the wire
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5 A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A24		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty driver's fuse/relay box
A10		Headlight switch ON (≣D) and jump A10 to battery voltage	The headlights should come on.	• Poor ground (G401) • Faulty headlight relay 1 or • An open in the wire • Faulty combination light switch
A5		Under all conditions	Attach to ground: The security indicator should come on.	• Blown No. 13 (7.5 A) fuse in the passenger's under-dash fuse/relay box • Faulty security indicator • An open in the wire
A22		Combination light switch ON	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • Faulty combination light switch • An open in the wire
		Combination light switch OFF	Check for continuity to ground: There should be no continuity.	
B16	RED/GRN	Combination light switch OFF	Check for continuity to ground: There should be no continuity.	• Faulty taillight relay • Faulty combination light switch • An open in the wire
		Combination light switch ON and jump B16 to battery voltage	The taillights should come on.	

BACK

Protected by AR

5. Reconnect the driver's multiplex control unit to the driver's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the back of the driver's under-dash fuse/relay box.
For driver's under-dash fuse/relay box connector socket location (see page 22-93).

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
O9	BLU/WHT	Ignition key is in the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition key switch • An open in the wire
		Ignition key is out of the ignition switch	Check for voltage to ground: There should be 5 V or more.	
A3	GRN/ORN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground
B6	YEL	Hood open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G201) • Faulty hood switch • An open in the wire
		Hood closed	Check for voltage to ground: There should be 5 V or more.	• Faulty hood switch • Short to ground
B8	BLU/GRN	Trunk lid open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G601) • Faulty trunk latch switch • An open in the wire
		Trunk lid closed	Check for voltage to ground: There should be 5 V or more.	• Faulty trunk latch switch • Short to ground

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

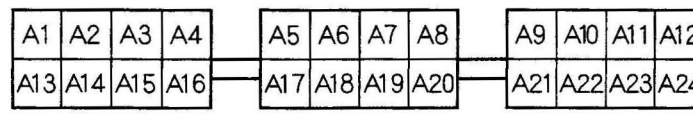
Multiplex Control Unit, Passenger's:

6. Remove the passenger's multiplex control unit from the passenger's under-dash fuse/relay box, and disconnect its connector.

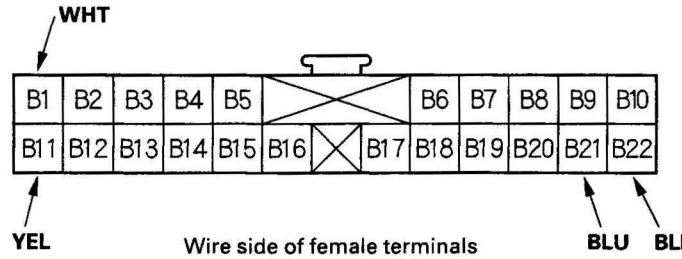
7. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 8.

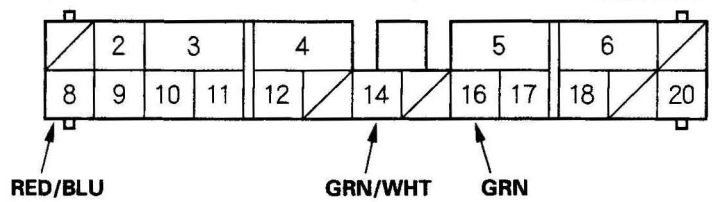
FUSE/RELAY BOX SOCKET



MULTIPLEX CONTROL UNIT, PASSENGER'S CONNECTOR B

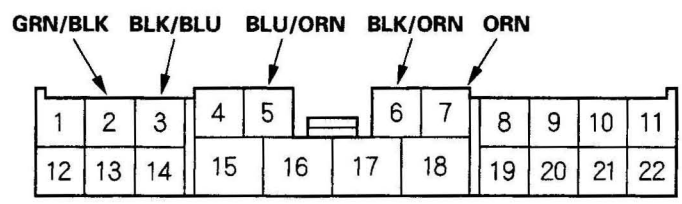


PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR A



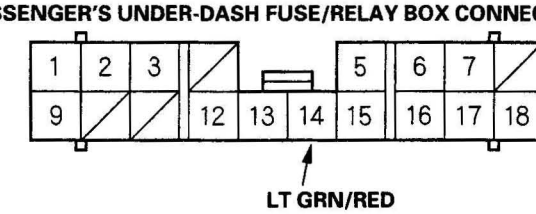
Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR F



Wire side of female terminals

PASSENGER'S UNDER-DASH FUSE/RELAY BOX CONNECTOR I



Wire side of female terminals

BACK

Protected by AR

8. With the passenger's multiplex control unit still disconnected, make these input tests at the connectors and the passenger's under-dash fuse/relay box sockets.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 9.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G581) • An open in the wire
A9		Under all conditions	Attach to ground: Horn should sound.	• Blown No. 47 (20 A) fuse in the under-hood fuse/relay box • Faulty horn relay • Faulty horn • An open in the wire
A20		Under all conditions	Attach to ground: Headlights should come on.	• Faulty headlight relay • An open in the wire
A21		Ceiling light switch in the middle position	Attach to ground: Ceiling light should come on.	• Blown No. 11 (7.5 A) fuse in the passenger's under-dash fuse/relay box • Faulty ceiling light • An open in the wire
A22		Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A23		Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (20 A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A24		Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5 A) fuse in the passenger's under-dash fuse/relay box • Faulty passenger's under-dash fuse/relay box
B22	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G504) • An open in the wire
A10	Fuse/relay box socket	Jump A10 to battery voltage, then jump B11 to body ground.	Check driver's door lock operation: The door should lock.	• Faulty passenger's under-dash fuse/relay box • An open in the wire • Faulty driver's actuator
B11	YEL			
A11	Fuse/relay box socket	Jump A10 to battery voltage and A11 to body ground.	All passenger doors should lock.	• Faulty passenger's under-dash fuse/relay box • An open in the wire • Faulty passenger's actuator
B1	WHT	Jump B1 to battery voltage momentarily.	Check trunk lid opener operation: Trunk lid should open.	• Poor ground (G601) • Faulty trunk lid opener solenoid • An open in the wire
I14	LT GRN/RED	Jump B20 to battery voltage momentarily.	Check buzzer operation: Buzzer should sound.	• Poor ground (G202) • Faulty keyless buzzer • An open in the wire

(cont'd)

BACK

Protected by AR

Control Unit Input Test (cont'd)

9. Reconnect the passenger's multiplex control unit to the passenger's under-dash fuse/relay box, and perform the following input tests at the appropriate connectors on the passenger's under-dash fuse/relay box. If a second key is not available for the key cylinder tests, make a non-immobilizer copy.
For passenger's under-dash fuse/relay box connector socket location (see page 22-94).

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 10.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
F5	BLU/ORN	Front passenger's door lock switch in UNLOCK	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G581) • Faulty front passenger's door lock switch • An open in the wire
		Front passenger's door lock switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door lock switch • Short to ground
F6	BLK/ORN	Front passenger's door lock switch in LOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • Faulty front passenger's door lock switch • An open in the wire
		Front passenger's door lock switch in the neutral position	Check for voltage to ground:There should be 5 V or more.	• Faulty front passenger's door lock switch • Short to ground
F3	BLK/BLU	Front passenger's door lock key cylinder locked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • Faulty or misaligned front passenger's door lock key cylinder switch • An open in the wire
		Front passenger's door lock key cylinder the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty or misalignedfront passenger's door lock key cylinder switch • Short to ground
F7	ORN	Front passenger's door lock key cylinder unlocked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • Faulty or misaligned front passenger's door lock key cylinder switch • An open in the wire
		Front passenger's door lock key cylinder the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty or misaligned front passenger's door lock key cylinder switch • Short to ground
A14	GRN/WHT	Right rear door opened	Check for voltage to ground: There should be 1 V or less.	• Faulty right rear door switch • An open in the wire
		Right rear door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty right rear door switch • Short to ground
A16	GRN	Front passenger's door opened	Check for voltage to ground: There should be 1 V or less.	• Faulty front passenger's door switch • An open in the wire
		Front passenger's door closed	Check for voltage to ground: THere should be 5 V or more.	• Faulty front passenger's door switch • Short to ground
A8	RED/BLU	Right and left rear door lock knob unlocked *	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • Faulty right or left rear door lock switch • An open in the wire
		Right and left rear door lock knob locked	Check for voltage to ground: There should be 5 V or more.	• Faulty right or left rear door lock switch • Short to ground
F2	GRN/BLK	Front passenger's door lock knob unlocked *	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G581) • An open in the wire • Faulty front passenger's door lock actuator
		Front passenger's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door lock actuator • Short to ground
B21	BLU	Under all conditions	Check for voltage to ground: There shoudl be 1 V or less.	• An open in the wire • Poor ground (G502) • Faulty connections at the audio unit or navigation display • Faulty audio unit or navigation display

* : When testing, lock all passenger's doors then unlock them one at a time. Any shorted actuator or wire will affect the voltage tests on A8 and A2.

BACK

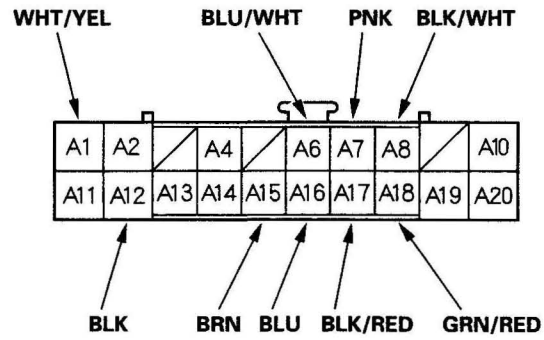
Protected by AR

Multiplex Control Unit, Door

10. Remove the door multiplex control unit, and disconnect its connector.

11. Inspect the connector and socket terminals to be sure they are making good contact

    - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
    - If the terminals look OK, go to step 12.



Wire side of female terminals

12. With the door multiplex control unit still disconnected, make these input tests at the connector.

    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, go to step 13.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
A12	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401) • An open in the wire

(cont'd)

Protected by AR

Control Unit Input Test (cont'd)

13. Reconnect the connector to the door multiplex control unit, make these input tests at the connector.

    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, go to step 14.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A6	BLU/WHT	Driver's door key cylinder switch in LOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty or misaligned driver's door key cylinder switch • Poor ground (G401) • An open in the wire
		Driver's door key cylinder switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty or misaligned driver's door key cylinder switch • Short to ground
A16	BLU	Driver's door key cylinder switch in UNLOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty or misaligned driver's door key cylinder switch • Poor ground (G401) • An open in the wire
		Driver's door key cylinder switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty or misaligned driver's door key cylinder switch • Short to ground
A7	PNK	Driver's door lock knob locked	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock actuator • Poor ground (G401) • An open in the wire
		Driver's door lock knob unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock actuator • Short to ground
A17	BLK/RED	Driver's door lock knob unlocked	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock actuator • Poor ground (G401) • An open in the wire
		Driver's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock actuator • Short to ground
A8	BLK/WHT	Driver's door lock switch in LOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock switch • Poor ground (G401) • An open in the wire
		Driver's door lock switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground
A18	GRN/RED	Driver's door lock switch in UNLOCK	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door lock switch • Poor ground (G401) • An open in the wire
		Driver's door lock switch in the neutral position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground

14. If all the input tests prove OK, one of the control units must be faulty, Substitute a known-good control unit for the one that is most likely at fault, then recheck the system. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely unit to be at fault, and recheck. If the system works properly, the original unit is faulty; replace it.

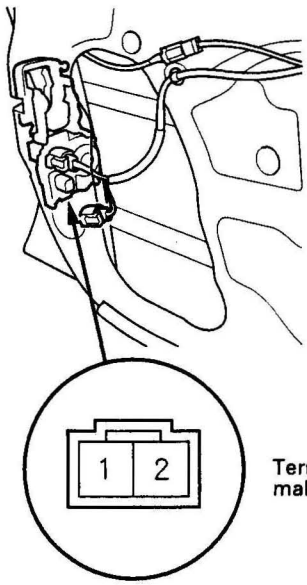
BACK

Protected by AR

Door Lock Actuator Test

Driver's door:

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 2P connector from the actuator.



Terminals side of male terminals

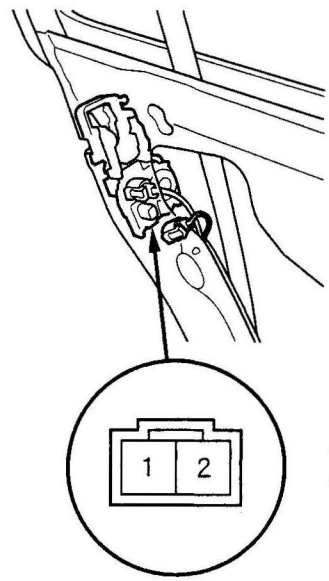
3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

4. If the actuator does not work as specified, replace it.

Passenger's door:

1. Remove the passenger's door panel (see page 20-6).
2. Disconnect the 2P connector from the actuator.



Terminal side of male terminals

3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

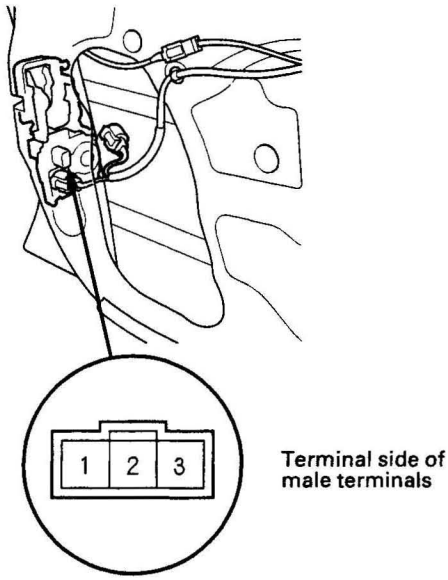
4. If the actuator does not work as specified, replace it.

Protected by AR

Door Lock Knob Switch Test

Driver's door:

1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 3P connector from the actuator.



Terminal side of male terminals

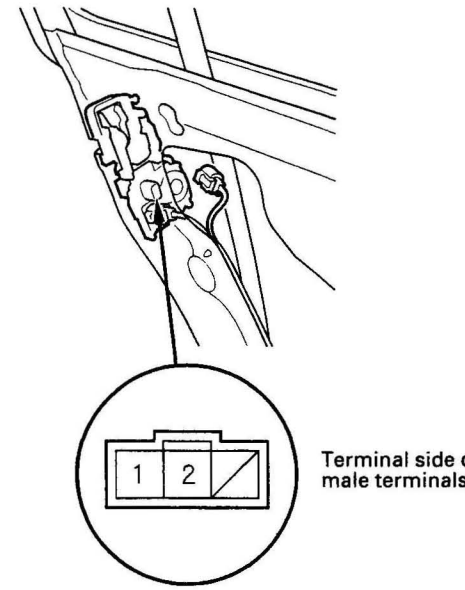
3. Check for continuity between the terminals in each knob switch position according to the table.

Terminal / Position	1	2	3
LOCK	○	○	
UNLOCK		○	○

4. If the continuity is not as specified, replace the door lock actuator.

Passenger's door:

1. Remove the passenger's door panel (see page 20-6).
2. Disconnect the 3P connector from the actuator.



Terminal side of male terminals

3. Check for continuity between the terminals in each knob switch position according to the table.

Terminal / Position	1	2
LOCK		
UNLOCK	○	○

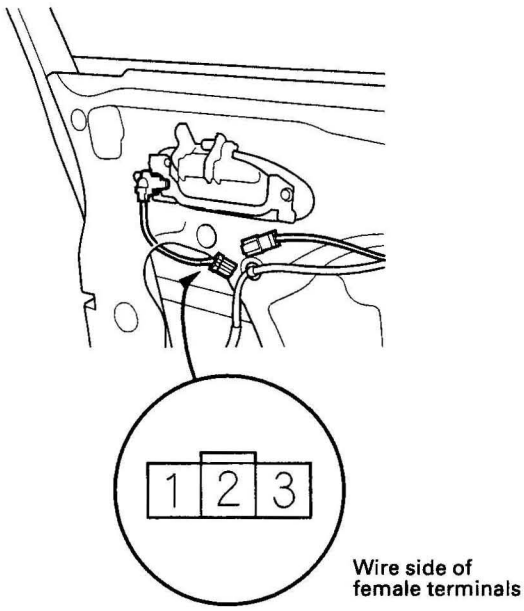
4. If the continuity is not as specified, replace the door lock actuator.

BACK

Protected by AR

Door Key Cylinder Switch Test

1. Remove the door panel (see page 20-6).
2. Disconnect the 3P connector from the key cylinder switch.



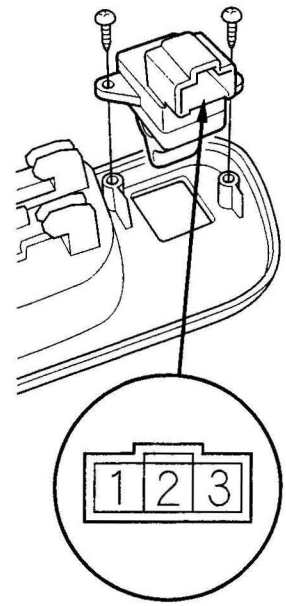
3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1	2	3
LOCK		○	○
OFF			
UNLOCK	○	○	

4. If the continuity is not as specified, replace the key cylinder switch.

Door Lock Switch Test

1. Remove the door panel (see page 20-6).
2. Remove the two screws, then remove the door lock switch.



3. Check for continuity between the terminals in each switch position according to the table.

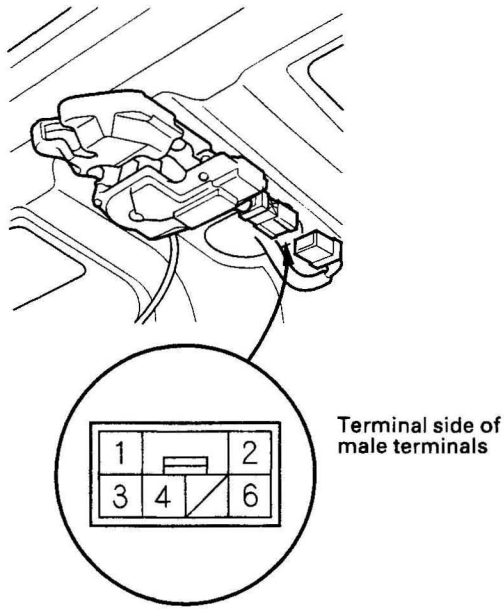
Terminal / Position	1	2	3
LOCK	○	○	
OFF			
UNLOCK		○	○

4. If the continuity is not as specified, replace the door lock switch.

Protected by AR

Trunk Lid Opener Solenoid/Latch Switch Test

1. Open the trunk lid.
2. Disconnect the 6P connector from the trunk latch.



3. Check opener solenoid operation by connecting power and ground according to the table. To prevent damage to the solenoid, apply battery voltage only momentarily.

Terminal / Position	3	4
UNLOCK	⊕	⊖

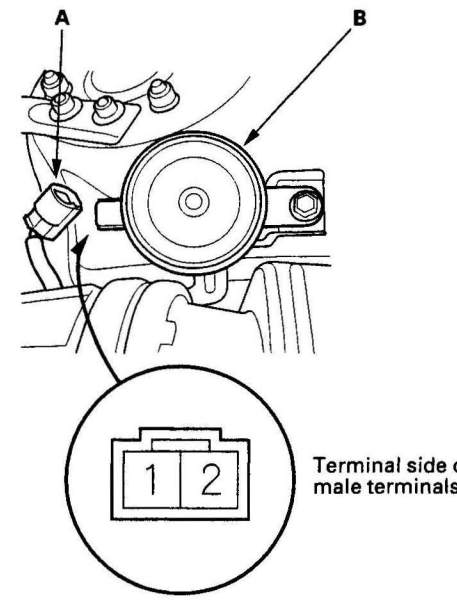
4. Check for continuity between the terminals in each trunk lid position according to the table.

Terminal / Position	2	6
Opened	○	○
Closed		

5. If the opener solenoid does not operate or the continuity is not as specified, replace the trunk lid opener solenoid/latch switch.

Security Horn Test

1. Open the hood.
2. Disconnect the 2P connector (A) from the security horn (B).
3. Test the horn by connecting battery power to No. 2 and grounding to No. 1 terminals. The horn should sound.



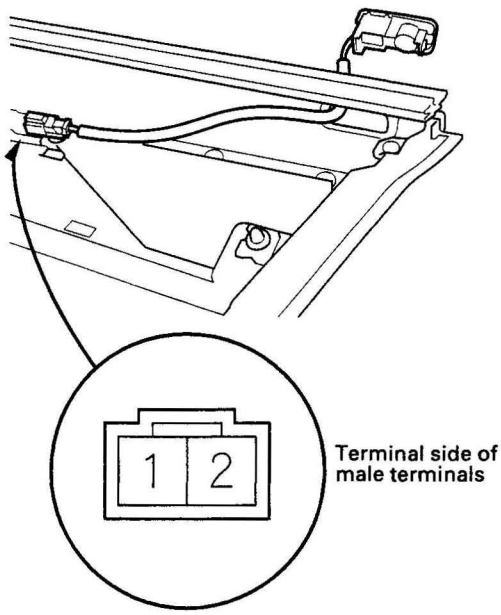
4. If it fails to sound, replace it.

BACK

Protected by AR

Security Indicator Test

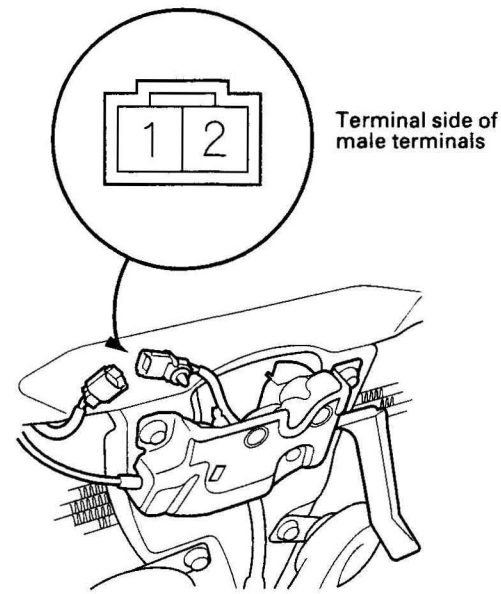
1. Remove the driver's door panel (see page 20-6).
2. Disconnect the 2P connector from the security indicator.



3. The LED should come on when power is connected to terminal No. 2, and ground is connected to terminal No. 1.
4. If the LED does not come on, replace the security indicator.

Hood Switch Test

1. Open the hood.
2. Disconnect the 2P connector from the hood switch.



3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1	2
Hood open (Lever released)	○	○
Hood closed (Lever pushed down)		

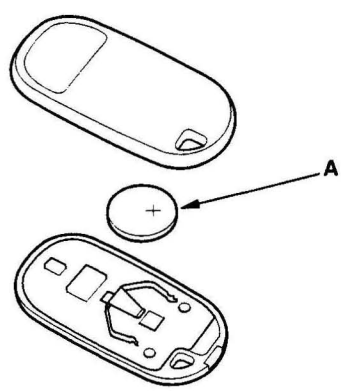
4. If the continuity is not as specified, replace the hood switch.

Protected by AR

Transmitter Test

NOTE:
- If the doors unlock or lock with the transmitter, but the LED on the transmitter does not come on, the LED is faulty; replace the transmitter.
- If any door is open, you cannot lock the door with the transmitter.
- If you unlocked the doors with the transmitter, but do not open any of the doors within 30 seconds, the doors relock automatically.
- The doors do not lock or unlock with the transmitter if the ignition key is inserted in the ignition switch.

1. Press the lock or unlock button 5 or 6 times to reset the transmitter.
   - If the locks work, the transmitter is OK.■
   - If the locks don't work, go to step 2.
2. Open the transmitter and check for water damage.
   - If you find any water damage, replace the transmitter.■
   - If there is no water damage, go to step 3.
3. Replace the transmitter battery (A) with a new one, and try to lock and unlock the doors with the transmitter by pressing the lock or unlock button 5 or 6 times.
   - If the doors lock and unlock, the transmitter is OK.■
   - If the doors don't lock and unlock, go to step 4.



4. Reprogram the transmitter, then try to lock and unlock the doors.
   - If the doors lock and unlock, the transmitter is OK.■
   - If the doors don't lock and unlock, replace the transmitter.■

Transmitter Programming

Storing transmitter codes:
The codes of up to three transmitters can be programed into the keyless receiver unit memory. (If a fourth code is stored, the code which was input first will be erased.)

NOTE: It is important to maintain the time limits between the steps. Make sure the door's, the hood, and the trunk are closed.

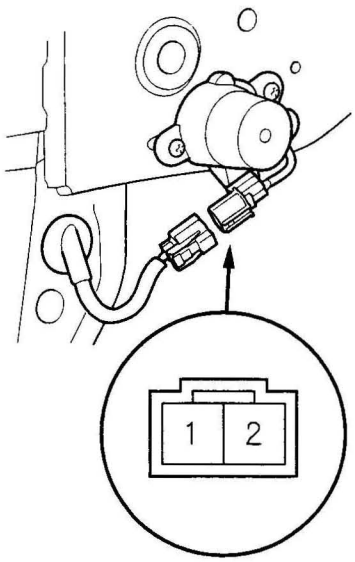
1. Turn the ignition switch ON (II).
2. Within 1 to 4 sec., push the transmitter lock or unlock button with the transmitter aimed at the receiver in the passenger's multiplex control unit.
3. Within 1 to 4 sec., turn the ignition switch OFF.
4. Within 1 to 4 sec., turn the ignition switch ON (II).
5. Within 1 to 4 sec., push the transmitter lock or unlock button with the transmitter aimed at the receiver in the passenger's multiplex control unit.
6. Within 1 to 4 sec., turn the ignition switch OFF.
7. Within 4 sec., turn the ignition switch ON (II).
8. Within 1 to 4 sec., push the transmitter lock or unlock button with the transmitter aimed at the receiver in the passenger's multiplex control unit.
9. Within 1 to 4 sec., turn the ignition switch OFF.
10. Within 4 sec., turn the ignition switch ON (II).
11. Within 1 to 4 sec., push the transmitter lock or unlock button with the transmitter aimed at the receiver in the passenger's multiplex control unit.
12. Confirm you can hear the sound of the door lock actuators. Within 1 to 4 sec., push the transmitter lock or unlock button again. The keyless receiver's now in the programming mode. You must push transmitter lock or unlock button of the first tramsmitter again program that transmitter.
13. Within 10 sec., aim the transmitters (up to three) whose codes you want to store at the receiver, and press the transmitter lock or unlock buttons. Confirm that you can hear the sound of the door lock actuators after each transmitter code is stored.
14. Turn the ignition switch OFF, and pull out the key.
15. Confirm proper operation with the new codes(s).

BACK

Protected by AR

Keyless Buzzer Test

1. Remove the right inner fender (see page 20-129).
2. Disconnect the 2P connector from the keyless buzzer.

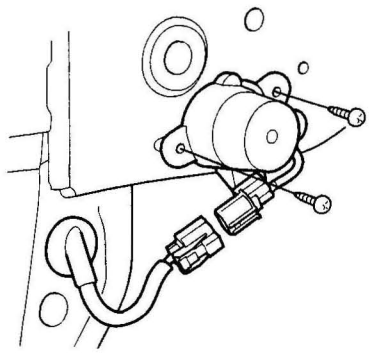


Terminal side of male terminals

3. Test the buzzer by connecting battery power to the No. 2 terminal and grounding the No. 1 terminal. The buzzer should sound.
4. If the buzzer fails to sounds, replace it.

Keyless Buzzer Replacement

1. Remove the right inner fender (see page 20-129).
2. Disconnect the 2P connector from the keyless buzzer.

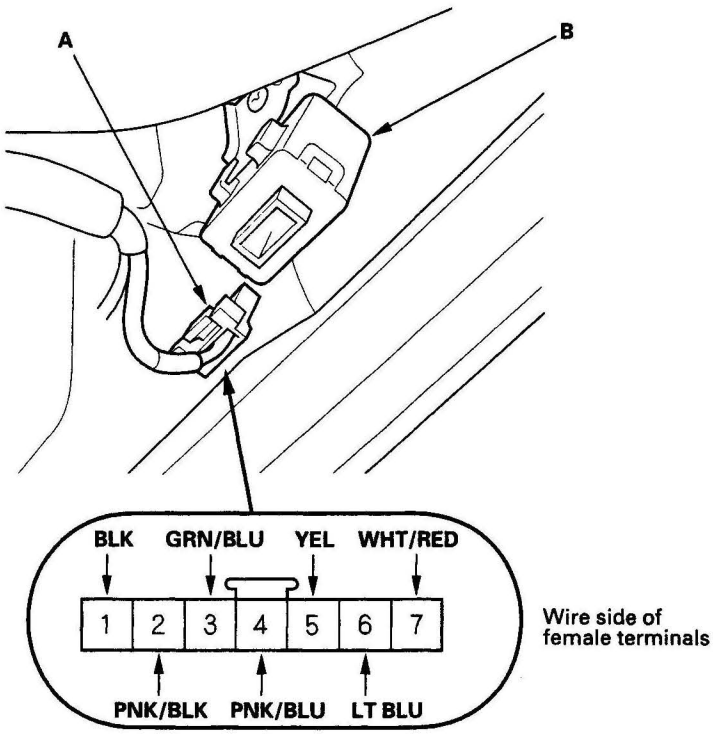


3. Remove the two mounting screws and the buzzer.

Protected by AR

Keyless Receiver Unit Input Test

1. Remove the glove box and glove box cover (see page 20-66).
2. Disconnect the 7P connector (A) from the keyless receiver unit (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals are OK, go to step 4.

BACK

Protected by AR

4. With the connector still disconnected, make these input tests at the connector.

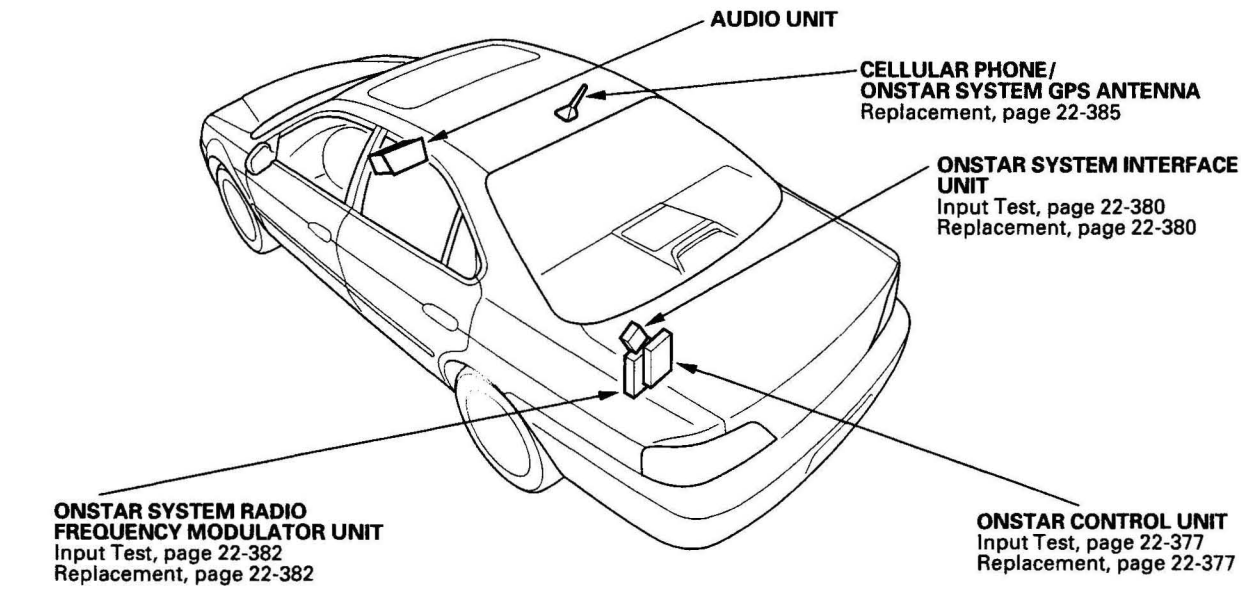
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, replace the keyless receiver unit.

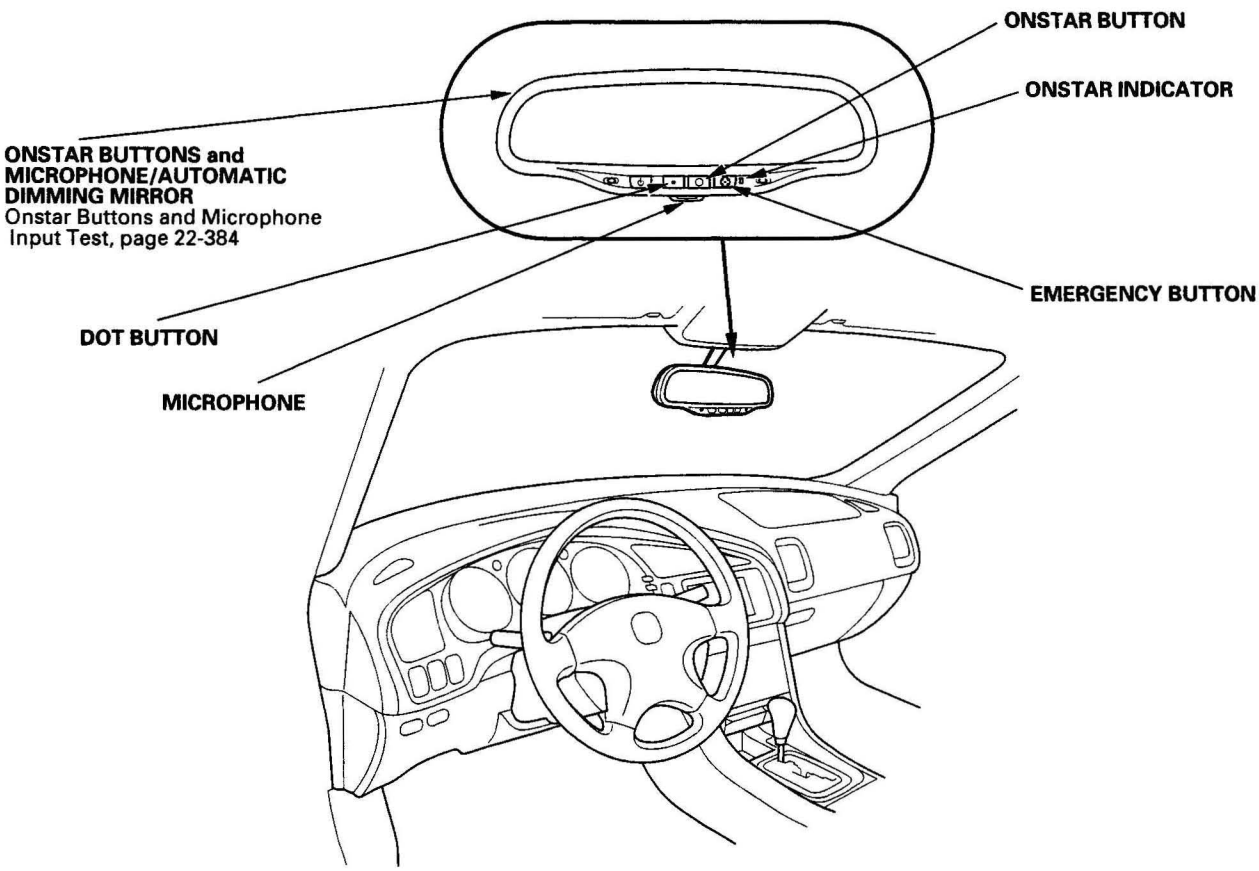
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
5	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box • An open in the wire
7	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 13 (7.5 A) fuse in the passenger's under-dash fuse/ relay box • An open in the wire
2	PNK/BLK	Under all conditions	Disconnect the driver's multiplex control unit connector "B". Check for continuity between the No. 2 terminal and driver's multiplex control unit B19 terminal. There should be continuity. There should be no continuity to body ground.	• An open or short to ground in the wire
3	GRN/BLU	Under all conditions	Disconnect the driver's multiplex control unit connector "B". Check for continuity between the No. 3 terminal and driver's multiplex control unit B18 terminal. There should be continuity. There should be no continuity to body ground.	• An open or short to ground in the wire
4	PNK/BLU	Under all conditions	Disconnect the driver's multiplex control unit connector "B". Check for continuity between the No. 4 terminal and driver's multiplex control unit B20 terminal. There should be continuity. There should be no continuity to body ground.	• An open or short to ground in the wire
6	LT BLU	Under all conditions	Disconnect the driver's multiplex control unit connector "B". Check for continuity between the No. 6 terminal and driver's multiplex control unit B21 terminal. There should be continuity. There should be no continuity to body ground.	• An open or short to ground in the wire

Protected by AR

Component Location Index

'03 Model:





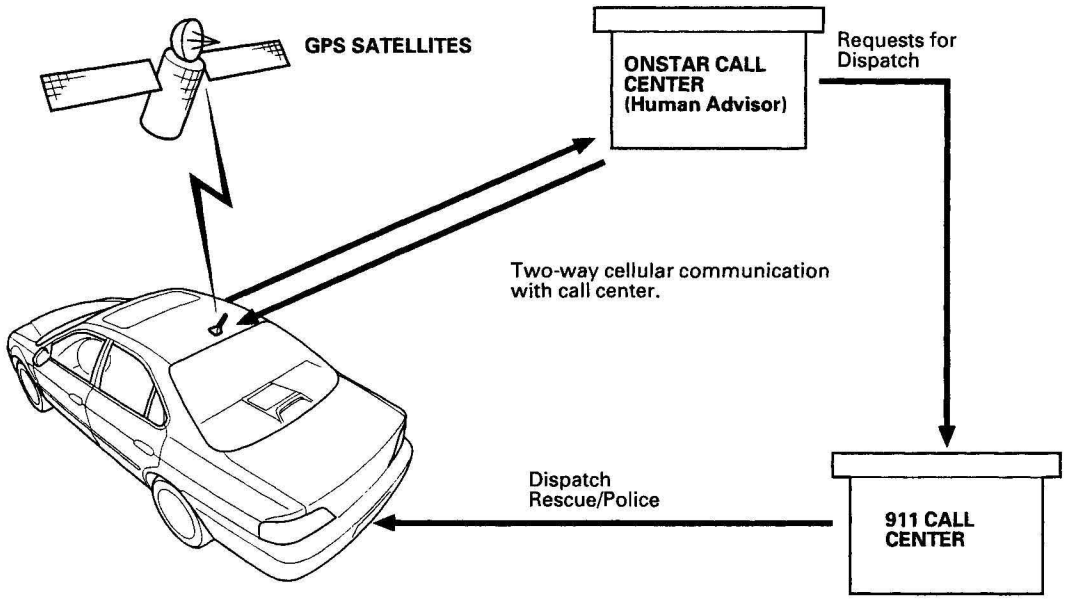
BACK

Protected by AR

Description

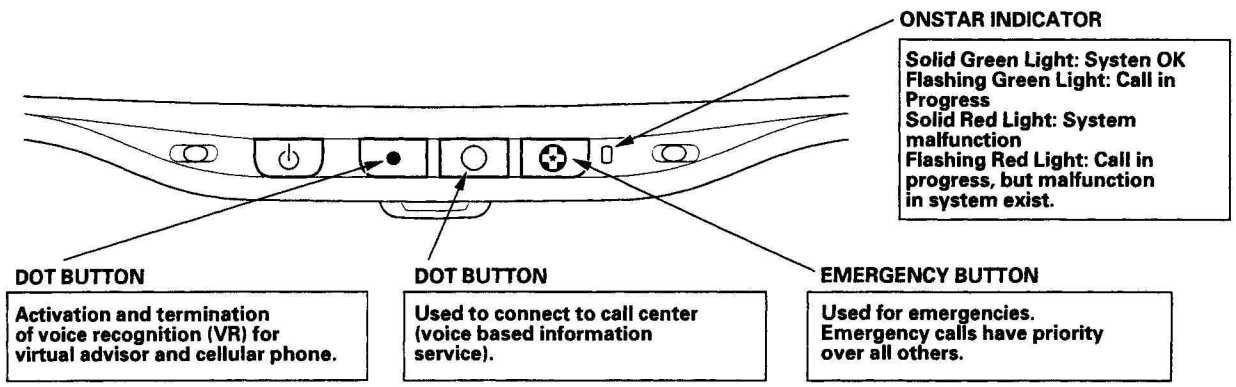
'03 Model:
Basic operation:

- OnStar system is activated.
- Data is transmitted to service provider.



- Call center associate makes appropriate response:
  - Accident/Emergency notification (Police, Fire and EMS, etc.)
  - Airbag deployment (Accident)
  - Roadside assistance
  - Stolen vehicle tracking
  - Remove door lock/unlock command
  - Misplaced vehicle (Flashes parking lights/honks horn)
  - Route guidance
  - Ride Assist
  - Concierge services/convenience

Buttons and indicator:



(cont'd)

Protected by AR

Description (cont'd)

Stolen vehicle tracking:
If the vehicle is stolen, the owner can report it to the call center. They will notify the authorities and track the vehicle location to assist in recovery.

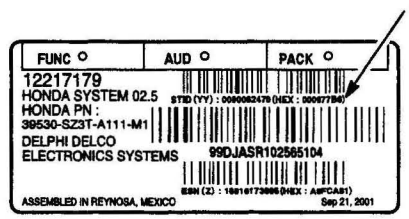
Virtual advisor:
- Virtual advisor setup. A subscriber sets up a personal profile on their home computer through the internet at the OnStar web site.
  - Stock portfolio
  - Traffic
  - Sports
  - News
  - Weather
  - E-mail
- Subscriber calls OnStar call center.
- OnStar receives and processes request.
- Profile accessed for requested information.
- OnStar sends information back to subscriber. A computer voice relays the requested information.

Cellular phone:
The user can make a hands-free cellular phone call with one touch (by pressing the "dot" button), and by using voice recognition commands.

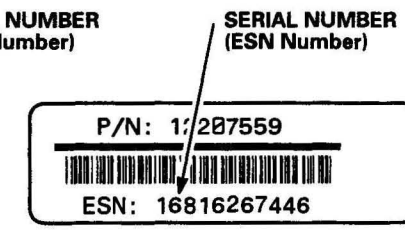
Remote operation:
Vehicle doors can be locked remotely if forgotten or unlocked when keys are accidentally left inside the vehicle. If the vehicle is misplaced in a parking lot, vehicle alert (honks the horn and flashes the parking lights) can be requested remotely.
NOTE: During normal vehicle operation, the system is in high power mode. After the ignition switch is turned OFF the system will go into low power mode for 48 hours, after that the system will switch to sleep mode to conserve battery power. When in low power mode, the system will switch back to the high power mode for 1 minute out of every 10 minutes for a period of 48 hours. Remote operation is only available during the 1 minute period of high power operation. When the system is in sleep mode, remote operation is not possible.

Registering replacement components:
If the OnStar control unit or the OnStar radio frequency modulator unit are replaced, you must call OnStar dealer support by regular telephone and register the new serial number(s).
Synchronizing replacement components:
After registering the new serial numbers with OnStar, you need to synchronize the components. Press and hold the DOT button until the OnStar indicator changes from solid green to solid red, and then back to solid green.

OnStar control unit:



OnStar system radio frequency modulator unit:



Client Support: 1-800-ONSTAR-7 (1-800-667-8277)

Dealer Support: 1-888-ONSTAR-1 (1-888-667-8271)

BACK

Protected by AR

Emergency call operation:

Button/Item	Pre-call status	Call in progress			Post-call status
Emergency button	Button is pushed	Emergency call in progress			
OnStar button		This button is inactive during an emergency call			
Dot button		Ends emergency call when pushed			
Speaker		Sound of system calling	Call center communication		
Phone line	Waiting	Connecting to call center	Linking to call center	Call ends (Dot button pushed)	Waiting
LED indicator	Green light	Flashing green light			Green light
Audio volume	Can be adjusted at any time by turning the volume knob				

OnStar Call operation:

Button/Item	Pre-call status	Call in progress			Post-call status
Emergency button		Will switch over to an emergency call when pushed			
OnStar button	Button is pushed	OnStar service call in the progress			
Dot button		Ends OnStar service call when pushed			
Speaker		Sound of system calling	Call center communication		
Phone line	Waiting	Connecting to call center	Linking to call center	Call ends (Dot button pushed)	Waiting
LED indicator	Green light	Flashing green light			Green light
Audio volume	Can be adjusted at any time by turning the volume knob				

Voice recognition operation:

Button/Item	Pre-call status	Voice recognition mode in use		Post-call status
Emergency button		Will switch over to an emergency call when pushed		
OnStar button		Will switch over to OnStar service call when pushed		
Dot button	Button is pushed	Voice recognition mode is activated and ends the voice recognition mode when pushed a second time		
Speaker		"Ready" Acknowledgement	Feedback sound of voice recognition	
Phone line	Waiting	Waiting for verbal command		Waiting
LED indicator	Green light	Green light		Green light
Audio volume	Can be adjusted at any time by turning the volume knob			

Voice recognition for cellular phone:

Button/Item	Pre-call status	Voice recognition mode for cellular phone in use			Post-call status
Emergency button		Will switch over to an emergency call when pushed			
OnStar button		Will switch over to OnStar service call when pushed			
Dot button	Button is pushed	Voice recognition mode is activated and ends the voice recognition mode when pushed a second time			
Speaker		"Ready" Acknowledgement	Feedback sound of voice recognition	Conversation in progress	
Phone line	Waiting	Waiting for verbal command		Linking to phone network	Waiting
LED indicator	Green light	Green light		Flashing green light	Green light
Audio volume	Can be adjusted at any time by turning the volume knob				

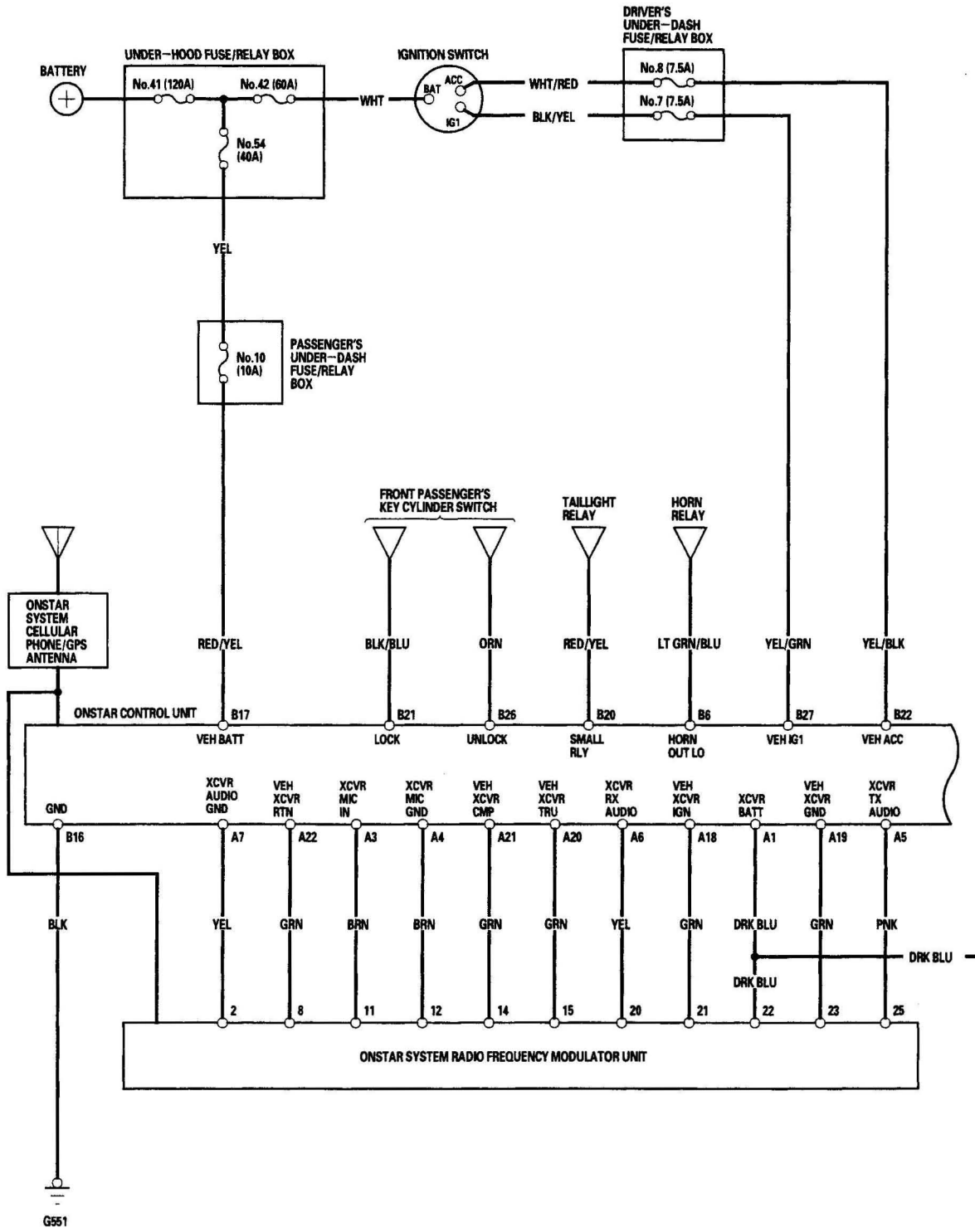
BACK

Protected by AR

OnStar System

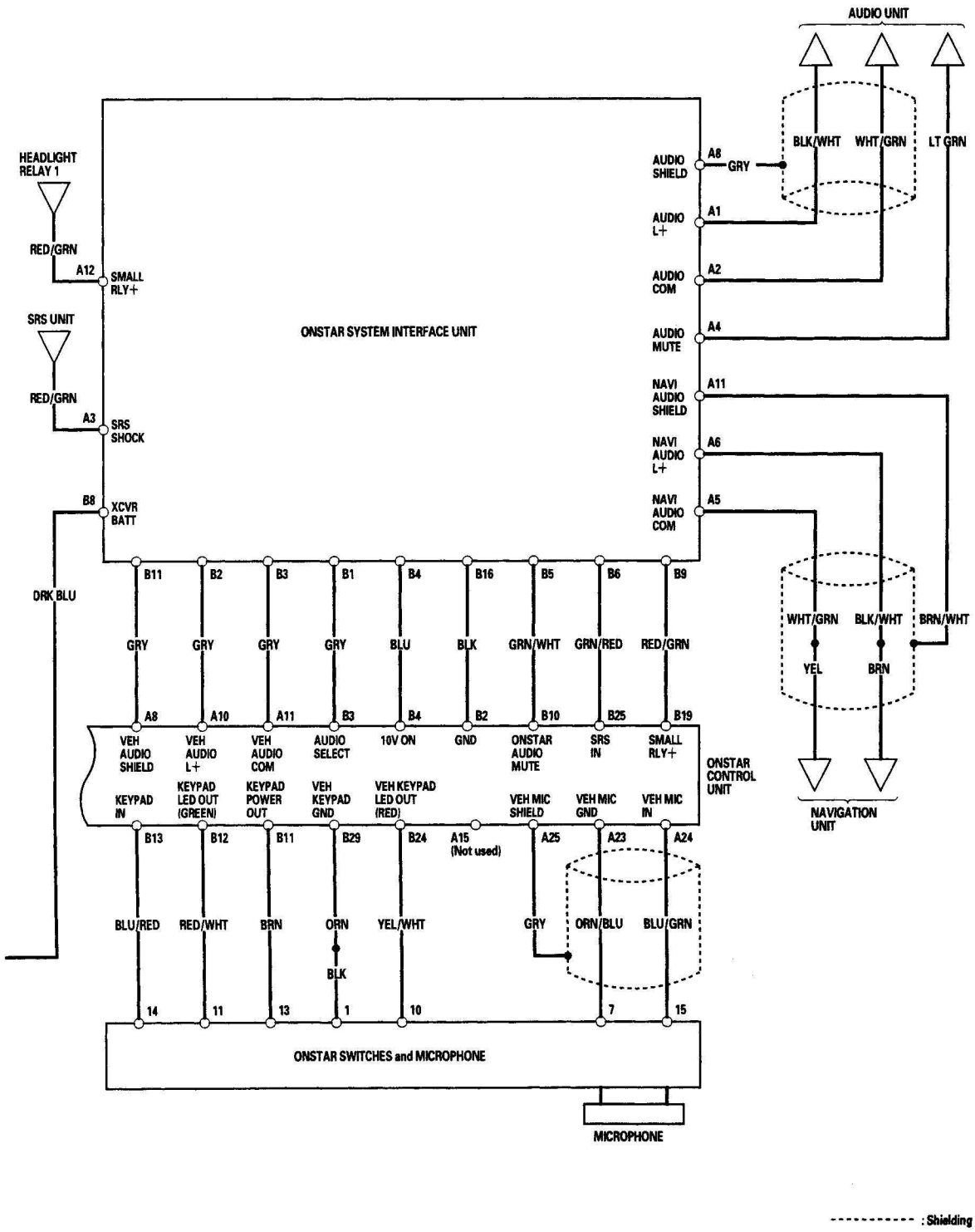
Circuit Diagram

'03 Model



BACK

Protected by AR



Protected by AR

Troubleshooting

'03 Model:

1. Check the No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box and the No. 10 (10A) fuse in the passenger's under-dash fuse/relay box.

   Are the fuses OK?

   YES – Go to step 2.

   NO – Find and repair the cause of the blown fuse. ■

2. Remove the OnStar control unit (see page 22-377).

3. Check for continuity between the B16 terminal of the OnStar control unit and body ground.

   Is there continuity?

   YES – Go to step 4.

   NO – Repair open in the BLK wire between the OnStar control unit and G551. ■

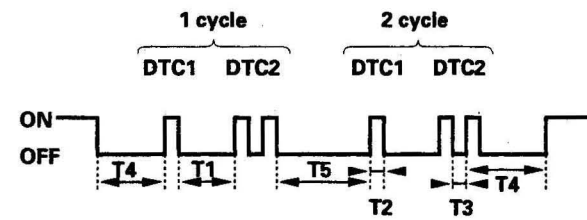
4. With the ignition switch OFF, press and hold the "dot" button. Turn the ignition switch from OFF to ACC three times and back to ACC, then release the "dot" button.

5. The indicator will flash (green or red) if any failures have been detected. Troubleshoot the DTCs as indicated below:

DTC	Self Diagnostics Items	Note
1	GPS signal error	
2	Inter-device dedicated bus malfunction	OnStar system radio frequency modulator unit communications error
3	Deployment commanded circuit malfunction	SRS signal out is open or shorted to ground between the SRS unit and the OnStar interface unit
4	OnStar control unit malfunction	
5	Cellular phone select service switch malfunction (button module)	Will only shows as "history" during DTC display

NOTE:
- Green indicator flashes historic (stored) failure DTCs.
- Red indicator flashes current failure DTCs.
- Current DTCs, are displayed first, followed by history DTCs, if any.
- DTCs are displayed in numerical order for two cycles. The indicator returns to normal function after the two cycles.

Example: When DTC1 and DTC2 are detected



T1: 1 sec. T2: 0.2 sec. T3: 0.3 sec. T4: 2 sec. T5: 3 sec.

How to clear the codes:
Press the OnStar button within 3 seconds after the second DTC cycle.

How to enter demonstration mode:

1. When ignition switch is turned OFF within 3 sec after DTC, system will be shifted to demonstration mode.

2. Each signals will appear in the order below.

   - 2 sec after ignition switch is OFF: Door lock
   - 1 sec after door lock: door: Door unlock
   - 1 sec after door unlock: Horn sounds and exterior lights flash for a period of 0.7 sec

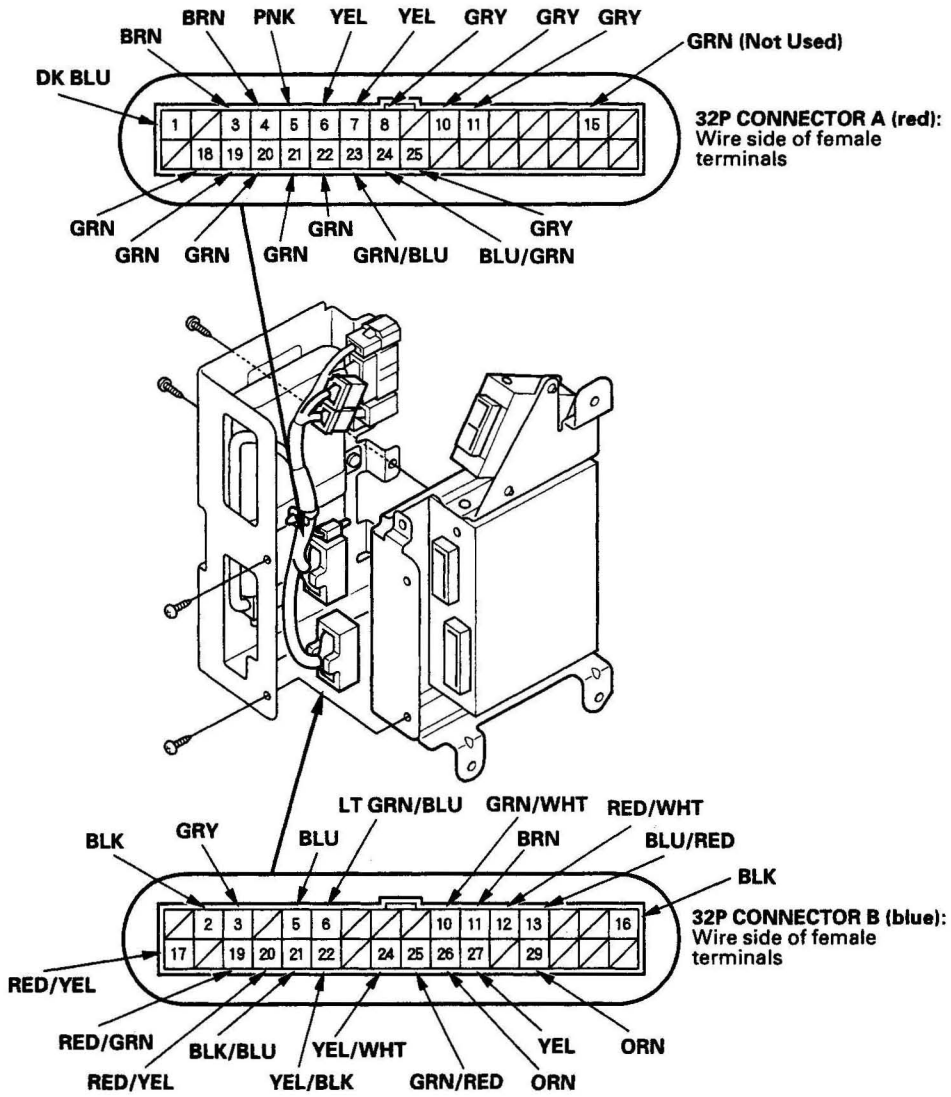
BACK

Protected by AR

OnStar Control Unit Input Test/Replacement

'03 Model:

1. Open the trunk lid, and remove the OnStar system control compartment cover.
2. Remove the OnStar system control compartment with bracket.
3. Remove four screws which installs the OnStar control unit and OnStar system interface unit onto bracket.
4. Disconnect the 32P connectors from the OnStar control unit.
5. Inspect the connector and socket terminals to be sure they are all marking good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     - If any test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the control unit must be faulty; replace it.



(cont'd)

BACK

Protected by AR

OnStar Control Unit Input Test/Replacement (cont'd)

Disconnect the connectors from the unit

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B17	RED/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 10 (10A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
B22	YEL/BLK	Ignition switch in ACC (I)	Check for voltage to ground: There should be battery voltage.	• Blown No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box • An open in the wire
B16	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G551) • An open in the wire
B6	LT GRN/BLU	Under all conditions	Connect to ground: All horns should sound.	• Blown No. 47 (20A) fuse in the under-hood fuse /relay box • Faulty horn relay • Either horn faulty • Poor ground • An open in the wire
B20	RED/YEL	Under all conditions	Connect to ground: The taillights should come on.	• Blown No. 13 (15A) fuse in the passenger's under-dash fuse/relay box • Faulty taillight relay • Faulty taillight system • An open in the wire

Reconnect the connectors to the unit

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B2	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire
B21	BLK/BLU	Front passenger's door lock key cylinder in neutral position	Check for voltage to ground: There should be battery voltage.	• Faulty front passenger's door lock key cylinder switch • Poor ground (G551) • An open in the wire • Short to ground (if you don't have 5 V when you should)
		Front passenger's door lock key cylinder in locked position	Check for voltage to ground: There should be less than 1 V.	
B26	ORN	Front passenger's door lock key cylinder in neutral position	Check for voltage to ground: There should be battery voltage.	
		Front passenger's door lock key cylinder in unlocked position	Check for voltage to ground: There should be less than 1 V.	
A18	GRN	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire
A25	GRY	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire • Faulty OnStar control unit
A23	ORN/BLU	Under all conditions	Check for continuity to ground: There should be continuity.	• Faulty OnStar buttons and microphone • An open in the wire • Faulty OnStar control unit
A24	BLU/GRN	Ignition switch in ACC (I). OnStar "DOT" button pushed. Speak into the microphone.	Check for voltage to ground: There should be about 4 V.	• Faulty OnStar buttons and microphone • An open in the wire
A10	GRY	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• An open in the wire • Short to ground • Faulty OnStar control unit
A11	GRY	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• An open in the wire • Short to ground • Faulty OnStar control unit

BACK

Protected by AR

Reconnect the connectors from the unit

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B4	BLU	Ignition switch in ACC (I)	Check for voltage to ground: There should be no voltage.	• Faulty OnStar button system interface unit • An open in the wire
		Ignition switch turned OFF	Check for voltage to ground: There should be about 10 V.	
B24	YEL/WHT	It is made to move to the malfunction mode of OnStar system	Check for voltage to ground: There should be 4 V.	• Faulty OnStar button system interface unit • An open in the wire
B25	GRN/RED	Ignition switch in ACC (I)	Check for voltage to ground: There should be less than 1 V.	• Faulty OnStar button system interface unit • An open in the wire
B29	ORN	Under all conditions	Check for continuity to ground: There should be continuity.	• Faulty OnStar button system interface unit • Poor ground (G551) • An open in the wire
B10	GRN/WHT	Ignition switch in ACC (I) OnStar "DOT" button pushed	Check for voltage to ground: There should be about 8 V. "DOT" button pushed: 0.3 V for 8 seconds then back to 8 V.	• Faulty OnStar button system interface unit • An open in the wire
B11	BRN	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• Faulty OnStar button system interface unit • An open in the wire
B12	RED/WHT	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V. Green LED solid: 6 V Flashing: 0—6 V Red LED: 0 V	• Faulty OnStar button system interface unit • An open in the wire
B13	BLU/RED	Ignition switch in ACC (I)	Check for voltage to ground: "DOT" button pushed: about 280 mV "OnStar" button pushed: about 1 V "Emergency" button pushed: about 1.7 V All button released: about 0.02 V	• Faulty OnStar button system interface unit • An open in the wire
A1	DK BLU	Ignition switch in ACC (I)	Check for voltage to ground: There should be vattery voltage.	• Blown No. 10 (10A) fuse in the passenger's under-dash fuse/relay box • An open in the wire
A18	GRN	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 7 V.	• Blown No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box • An open in the wire
A19	GRN	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G551) • An open in the wire
A7	YEL	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be about 0 V.	• Faulty OnStar button and microphone • An open in the wire
A22	GRN	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be about 3.8 V.	• Faulty OnStar button and microphone • An open in the wire
A3	BRN	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be about 6.6 V.	• Faulty OnStar button and microphone • An open in the wire
A4	BRN	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be about 0 V.	• Faulty OnStar button and microphone • An open in the wire
A21	GRN	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be 0—3 V.	• Faulty OnStar button and microphone • An open in the wire
A20	GRN	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be 0—3 V.	• Faulty OnStar button and microphone • An open in the wire
A6	YEL	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be about 3 V.	• Faulty OnStar button and microphone • An open in the wire
A5	PNK	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be about 6 V.	• Faulty OnStar button and microphone • An open in the wire

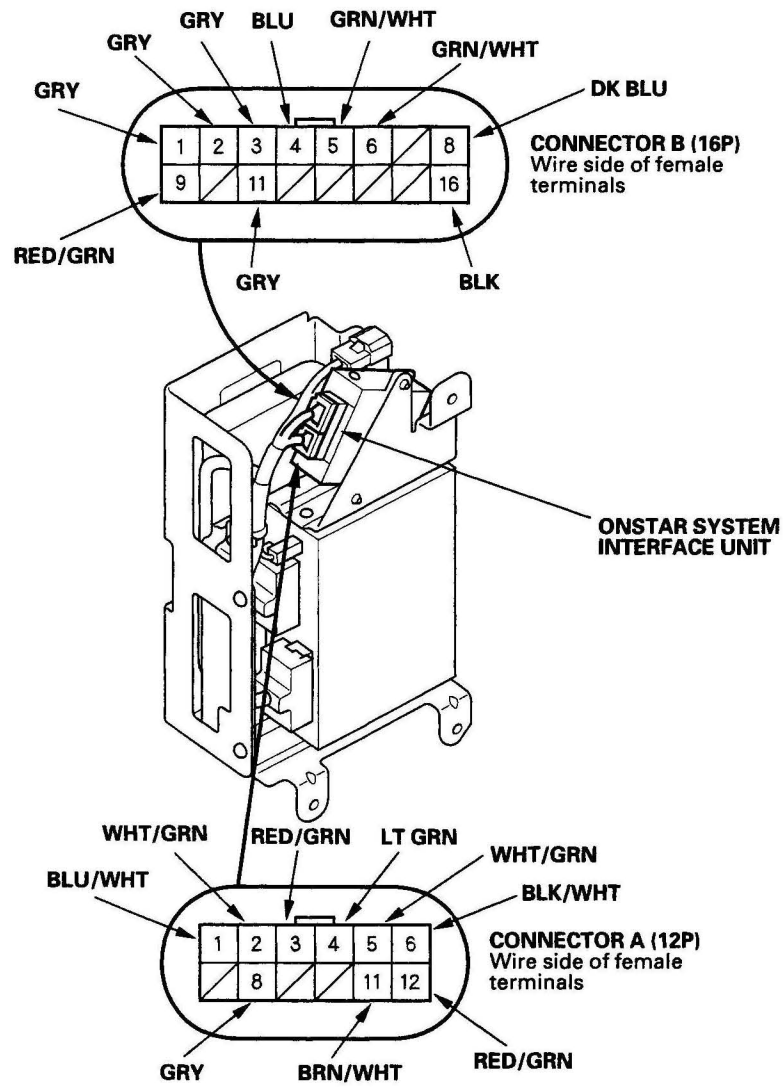
BACK

Protected by AR

OnSter System Interface Unit Input Test/Replacement

'03 Model:

1. Open the trunk lid, and remove the OnStar control unit cover.
2. Disconnect the 12P connector from the OnStar system interface unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repaer them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     - If any test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the control unit must be faulty; replace it.



BACK

Protected by AR

Reconnect the connectors to the unit

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B16	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire • An open in the OnSter control unit wire (B16) • Faulty OnSter control unit
A1	BLK/WHT	OnStar "DOT" button pushed and human advisor voice comes on	Check for continuity between the A1 terminal and audio unit or terminal: There should be continuity.	• Faulty audio unit • Faulty speaker • An open in the wire
A2	WHT/GRN	OnStar "DOT" button pushed and human advisor voice comes on	Check for continuity between the A2 terminal and audio unit or terminal: There should be continuity.	• Faulty audio unit • Faulty speaker • An open in the wire
A4	LT GRN	OnStar "DOT" button pushed and human advisor voice comes on	Check for continuity between the A4 terminal and audio unit or terminal: There should be continuity.	• Faulty audio unit • Faulty speaker • An open in the wire
A5	WHT/GRN	OnStar "DOT" button pushed and human advisor voice comes on	Check for continuity between the A5 terminal and navigation unit or terminal: There should be continuity.	• Faulty navigation unit • Faulty speaker • An open in the wire
A6	BLK/WHT	OnStar "DOT" button pushed and human advisor voice comes on	Check for continuity between the A6 terminal and navigation unit or terminal: There should be continuity.	• Faulty navigation unit • Faulty speaker • An open in the wire
B4	BLU	Ignition switch in ACC (I)	Check for voltage to ground: There should be no voltage.	• An open in the wire
		Ignition switch turned OFF	Check for voltage to ground: There should be 10 V.	
A12	RED/GRN	Combination light switch ON	Connect to ground:	• Blown No. 43 (20A) fuse in the under-hood fuse /relay box • Faulty taillight relay • Either taillight relay faulty • Poor ground (G551)
B6	GRN/WHT	Ignition switch in ACC (I)	Check for voltage to ground: There should be less than 1 V.	• An open in the wire
A8	GRY	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire • Faulty interface unit
A11	BRN/WHT	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire
B5	GRN/WHT	Ignition switch in ACC (I) OnStar "DOT" button pushed	Check for voltage to ground: There should be about 8 V.	• An open in the wire • Short or ground • Faulty interface unit
B1	GRY	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• An open in the wire • Short or ground • Faulty interface unit
B2	GRY	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• An open in the wire • Short or ground • Faulty interface unit
B3	GRY	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• An open in the wire • Short or ground • Faulty interface unit
B9	RED/GRN	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• An open in the wire
B11	GRY	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• An open in the wire
A3	RED/GRN	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 4 V.	• Faulty SRS unit • An open in the wire • Short to ground NOTE: Short to ground calls OnStar.

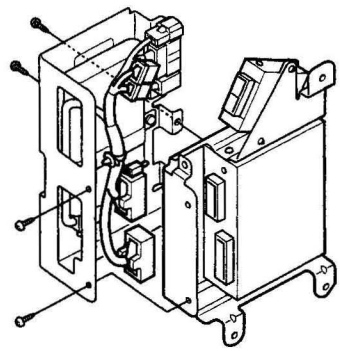
BACK

Protected by AR

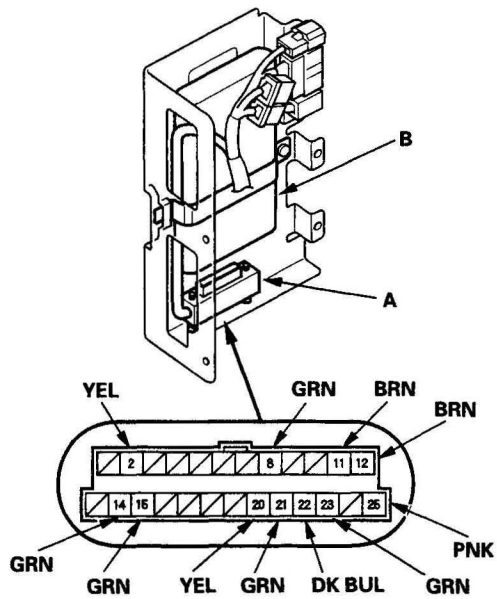
OnStar System Radio Frequency Modulator Unit Input Test/Replacement

'03 Model:

1. Open the trunk lid, and remove the OnStar system control compartment assembly cover.
2. Remove the OnStar control compartment with bracket.
3. Remove the four screws which install the OnStar control unit and OnStar system interface unit onto bracket.
4. Disconnect the five connectors from the OnStar control unit and OnStar system interface unit.



5. Release the clip on the bracket, and remove the OnStar system radio frequency modulator unit.
6. Disconnect the 25P connector (A) from the OnStar system radio frequency modulator unit (B).



7. Reconnect all connectors to the OnStar control unit and OnStar system interface unit.
8. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     - If any test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the control unit must be faulty; replace it.

BACK

Protected by AR

Disconnect the connectors from the unit

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
12	BRN	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire
23	GRN	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire

Reconnect the connectors from the unit

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
22	DK BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 54 (40A) fuse in the under-hood fuse/relay box • An open in the wire
21	GRN	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 7 V.	• Blown No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box • An open in the wire
25	PNK	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be about 6 V.	• An open in the wire
20	YEL	Ignition switch in ACC (I) OnStar " Emergency" button pushed	Check for voltage to ground: There should be about 3 V.	• An open in the wire
15	GR	Ignition switch in ACC (I) OnStar " Emergency" button pushed	Check for voltage to ground: There should be 0—3 V.	• An open in the wire
14	GRN	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be 0—3 V.	• An open in the wire
11	BRN	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be about 6.6 V.	• Faulty OnStar button and microphone • An open in the wire
8	GRN	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for voltage to ground: There should be about 3.8 V.	• An open in the wire
2	YEL	Ignition switch in ACC (I) OnStar "Emergency" button pushed	Check for continuity to ground: There should be continuity.	• An open in the wire

Protected by AR

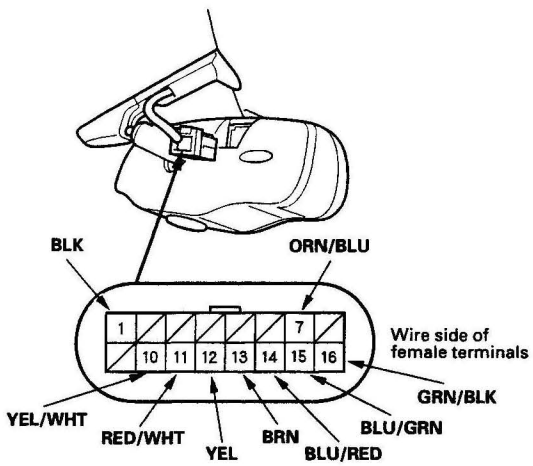
OnStar Buttons and Microphone Input Test

'03 Model:

1. Inspect the connector and socket terminals to be sure they are all making good contact.

   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     - If any test indicates a problem, find and correct the cause, then recheck the system.
     - If all the input tests prove OK, the switches and microphone must be faulty; replace it.

NOTE: No. 1, 12 and 16 terminals are automatic inside dimming mirror power, ground and signal lines.



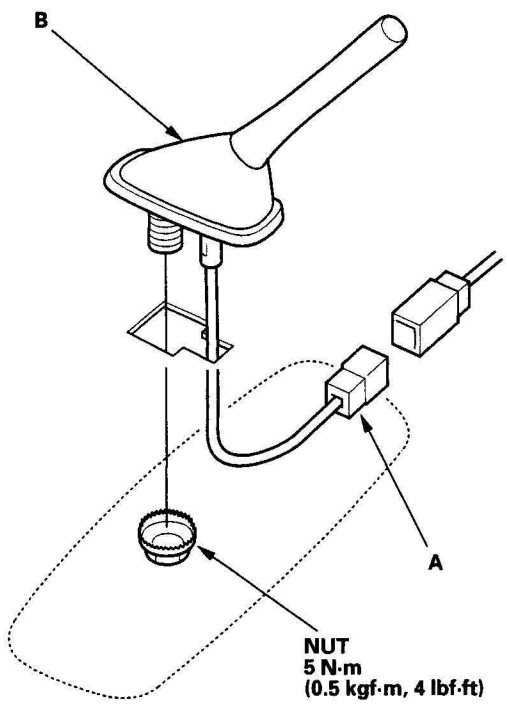
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
10	YEL/WHT	With the ignition switch OFF, press and hold the "DOT" button. Turn the ignition switch from OFF to ACC three times and back to ACC, then release the "DOT" button.	Check for voltage to ground: There should be 4 V.	• An open in the wire • Short to ground
11	RED/WHT	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• An open in the wire • Short to ground
13	BRN	Ignition switch in ACC (I)	Check for voltage to ground: There should be about 8 V.	• An open in the wire • Short to ground
14	BLU/RED	Ignition switch in ACC (I)	Check for voltage to ground: "DOT" button pushed: about 280 mV. "OnStar" button pushed: about 1 V. "Emergency" button pushed: about 1.7 V.	• An open in the wire • Short to ground
7	ORN/BLU	Under all conditions	Check for continuity to ground: here should be continuity.	• An open in the wire • Replace shielded harness
15	BLU/GRN	Ignition switch in ACC (I) OnStar "DOT" button pushed. Speak into the microphone.	Check for voltage to ground: There should be about 4 V.	• An open in the wire • Short to ground • Replace shielded harness
1	BLK	Under all condition	Check for continuity to ground: There should be continuity	• An open in the wire

BACK

Protected by AR

Cellular Phone/OnStar System GPS Antenna Replacement

1. Remove the rear ceiling light.
2. Disconnect the connector (A) from the antenna (B).
3. Remove the nut from the antenna.



Protected by AR

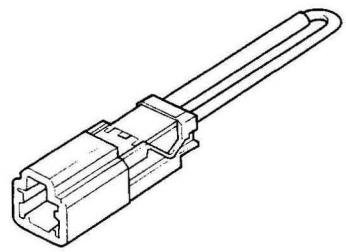
Navigation System

Special Tools 22-388
Component Location Index 22-389
General Troubleshooting Information 22-390
Symptom Troubleshooting Index 22-392
System Description 22-393
Circuit Diagram 22-406
Symptom Troubleshooting 22-412
Picture Diagnosis Test 22-425
Forced Starting of Display 22-430
Hard Disk Replacement 22-431
DVD-ROM Replacement 22-431
Vehicle Speed Pulse (VSP) Sensor Replacement 22-432
Navigation Unit Removal/Installation 22-432
Display Unit Removal/Installation 22-433
GPS Antenna Removal/Installation 22-433
Clock Display Size and Location Adjustment ('00-03 models) 22-434

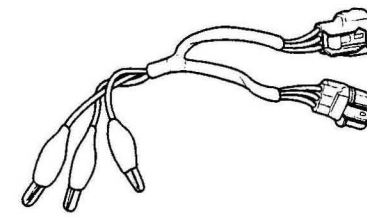
Protected by AR

Special Tools

Ref.No.	Tool Number	Description	Qty
①	07PAZ-0010100	SCS Service Connector	1
②	07LAJ-PT3020A	Test Harness	1



①

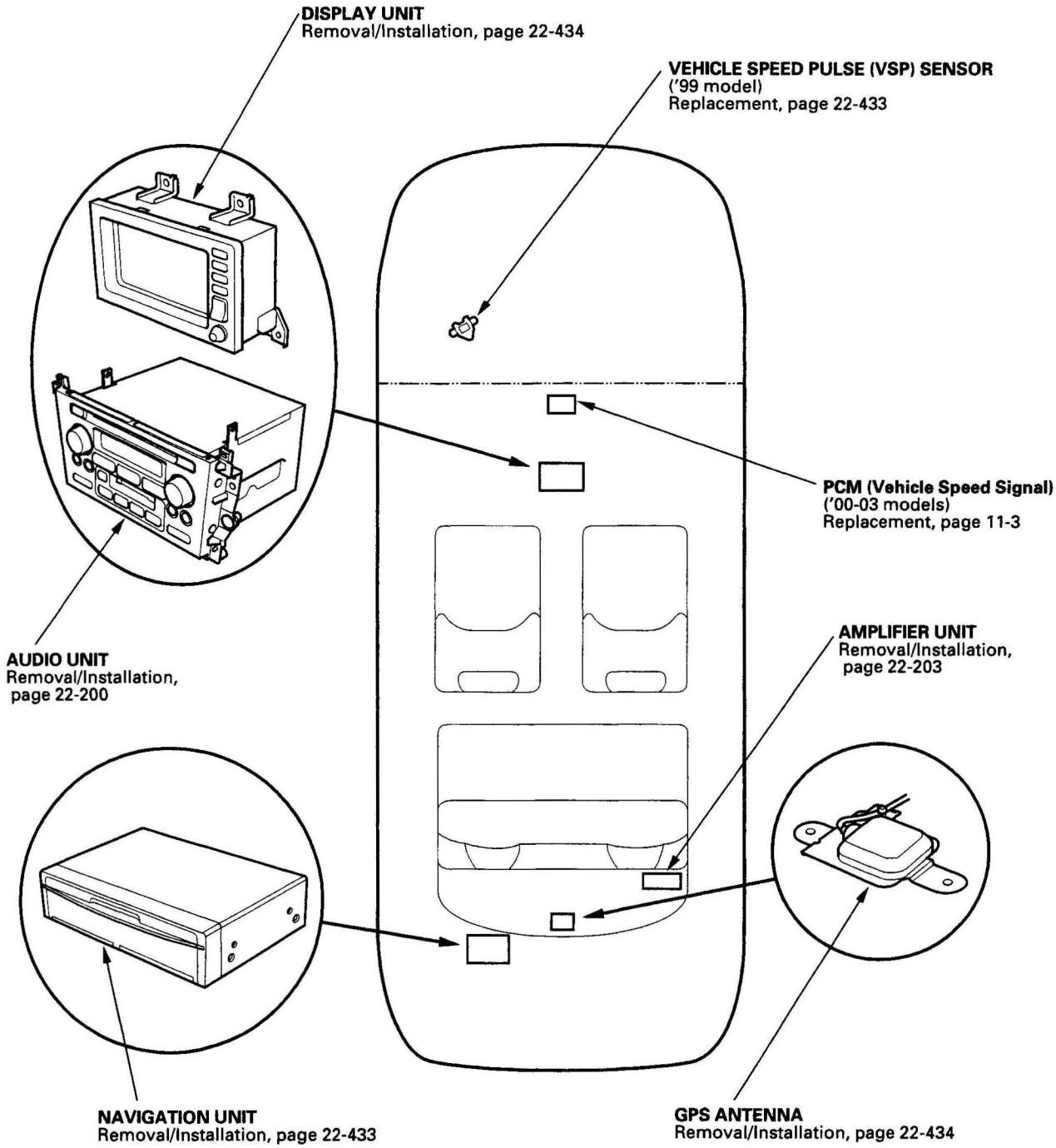


②

BACK

Protected by AR

Component Location Index



*: The illustration shows '00-01 models.

Protected by AR

General Troubleshooting Information

General Operation

Refer to the Acura Navigation Systerm Owner's manual for the navigation system operating procedures.

Anti-theft Feature

The navigation system has a coded theft protection circuit. Be sure to get customer's 4-digit security code number before;

- disconnecting the battery
- disconnecting the navigation unit connector
- removing the NAVIGATION (10A) fuse from the passenger's under-dash fuse/relay box
- removing the ACC (7.5A) fuse from the driver's under-dash fuse/relay box
- removing the ACC (7.5A) fuse from the driver's under-dash fuse/relay box

After service, reconnect power to the navigation unit, and turn the ignition switch ON (II). Enter the 4-digit security code, then select "Done".

When replacing the navigation unit, be sure to give the customer the new anti-theft security code.

NOTE: If the anti-theft security code does not activate the navigation unit, verify the code is correct one for the unit. Check the code against the navigation unit's serial number on the Acura DCS system. If the code is correct, replace the navigation unit.

Symptom Diagnosis

Certain circumstances and system limitations will result in occasional vehicle positioning errors. Some customers may think this indicates a problem with the navigation system when, in fact, the system is normal. Keep the following items in mind when interviewing customers about navigation system symptoms.

Self-Inertial Navigation limitations

The limitations of the self-inertial portion of the navigation system (the yaw rate sensor and the vehicle speed signal) can cause some discripancies between the vehicle's actual position and the indicated vehicle position (GPS vehicle position). However, if GPS signals cannot be received, you must tune the vehicle position manually.

The following circumstances may cause vehicle positioning errors:

- Moving the vehicle with the engine stopped, such as by ferry or tow truck, or if the vehicle is spun on a turn table
- Tire slippage, changes in tire rolling diameters, and some driving situations may cause discrepancies in travel distances. Examples of this include:
  - Continuous tire slippage on a slippery surface
  - Driving with snow chains mounted
  - Abnormal tire pressure
  - Incorrect tire size
  - Frequent lane changes across a wide highway
  - Continuous driving on a straight or gently curving highway
- Tolerances in the system and map inaccuracies sometimes limit how precisely the vehicle position is indicated. Examples of this include:
  - Driving on roads not shown on the map (map matching is not possible)
  - Driving on a road that winds in 1 derection, such as a loop bridge, an interchange, or a spiral parking garage
  - Driving on a road with a series of sharp hair-pin turns
  - Driving on one of two close parallel roads
  - After making many 90 degree turns

Global Positioning System (GPS) Limitations

The GPS cannot detect the vehicle's position during the following instances:

- For the first 5 to 10 minutes after reconnecting the battery
- When the satellite signals are blocked by tall building, mountains, tunnels, large trees, or large trucks
- When signal is blocked by window tinting that contains metal particles.
- When the GPS antenna is blocked by something on the package shelf
- When there is no satellite signal output (Signal output is sometimes stopped for satellite servicing)
- When the satellite signals are blocked by the operation of some electronic aftermarket accessories.

The accuracy of GPS is reduced during these instances:

- When only two satellite signals can be received (Three satellite signals are required for accurate positioning)
- When the satellite control centers are experiencing problems

BACK

Protected by AR

LCD Display Unit Limitations

- In cold temperatures, the display may stay dark for the first 2 or 3 minutes until it warms up.
- When the display is too hot because of direct summer sunlight, it will remain dark until the temperature drops.
- When the humidity is high and the interior temperature is low, the display may appear cloudy. The display will clear up after some use.
- Fingerprints on the touch panel may sometimes be noticeable because of the panel's low-reflection coating. When cleaning the panel, wipe it gently with a soft cloth. To avoid scratching the panel, do not rub too hard.
- The touch panel is an infrared system, so there is no need to press hard. If a touch switch does not function immediately, shift your finger slightly on the switch, and touch it again.
- Input may be affected by direct sunlight.

Symptom Duplication

- When the symptom can be duplicated, follow the self-diagnostic procedures (picture diagnosis mode) and the appropriate troubleshooting procedures.
- When the symptom does not reappear or only reappears intermittently, ask the customer about the conditions when the symptom occured.
  - Try to establish if outside interference may have been the cause.
  - Try to duplicate the symptom under the same conditions the customer was experiencing.
  - Vibration, temperature extremes, and moisture (dew, humidity) are factors that are difficult to duplicate.

Service Precautions

- Before disconnecting the battery, make sure you have the anti-theft codes for the radio and the navigation system, write down the frequencies for the radio's preset buttons.
- After servicing, park the vehicle in an area where the GPS satellite signals will be unobstructed, and check the satellite mark on the display.
- When the battery is disconnected, the clock is reset to "0:00". The clock will reset to the correct time after the system receives the GPS satellite signals.
- After reconnecting the battery, you have to wait to get the initial signal from the satellite. It will take about 10 minutes.
- Clear any address that you may have entered from the Previous Destination menu before returning the vehicle to the customer.

After Servicing Map-Matching

- Park the vehicle in an area where the GPS satellite signals will be unobstructed, and check the satellite mark on the display.
- Drive the vehicle 1 mile before entering a destination and confirm the road being used is displayed at the bottom of the screen (map matched).
- Enter the dealer adress and confirm the system routes and performs normally.
- Clear any address that you may have entered from the Previous Destination menu before returning the vehicle to the customer.

Protected by AR

Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
No picture is shown on the display	Troubleshooting (see step 1 on page 22-412)	
The picture is missing a color or tone	Troubleshooting (see step 1 on page 22-414)	
Display unit buttons do not work	Troubleshooting (see step 7 on page 22-415)	
GPS satellite icon is not indicated	Troubleshooting (see step 1 on page 22-417)	"Vehicle position does not move on the map"
Audio driving instructions cannot be heard	Troubleshooting (see step 1 on page 22-418)	Electronic aftermarket accessories
Vehicle position does not move or moves erratically on the map	Troubleshooting (see step 1 on page 22-424)	GPS satellite icon is not indicated

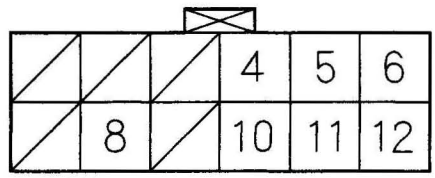
BACK

Protected by AR

System Description

Navigation Unit Inputs and Outputs for Connector A (12P)

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
4	WHT	R SIG	Red signal	Red color signal
5	RED	G SIG	Green signal	Green color signal
6	BRN/BLK	SH SIG	Shield signal	Shield for terminal No. 4, 5, 10, 11, 12
8 *	ORN	AMP SW+B	Amplifier switch+B	Power source signal of Amplifier
10	YEL	B SIG	Blue signal	Blue color signal
11	GRN	C SIG	Composite signal	Composite video (vertical/ horizontal) sychronozing signal
12	BLU	GND SIG	Ground signal	Ground for color signal

* : '00-03 models

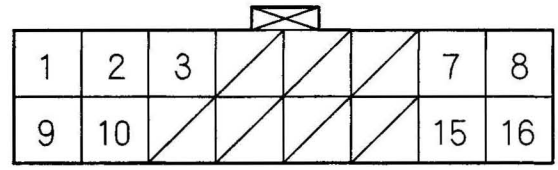
(cont'd)

Protected by AR

System Description (cont'd)

Navigation Unit Inputs and Outputs for Connector B (16P) ('99-02 Models)

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
1	ORN/BLU *1 BLU/GRN *2	RG R+	Route guidance right positive	Right audio signal of voice guidance
2	BRN/YEL *1 BRN/WHT *2	SH RG	Shield route guidance	Shield for terminal No. 1, 9, 10
3	WHT/BLK	MUTE	Mute	Audio mute signal
7	BLU/GRN	DISP BUS (+)	Display bus positive	Data bus (+)
8	RED/BLK	ILL+	Illumination positive	Parking light ON signal
9	ORN/BLU	RG L+	Route guidance left positive	Left audio signal of voice guidance
10	ORN	GND RG	Ground route guidance	Ground for voice guidance signal
15	ORN/BLU	DISP BUS (−)	Display bus negative	Data bus (−)
16	LT BLU	SH DISP BUS	Shield display bus	Shield for terminal No. 7, 15

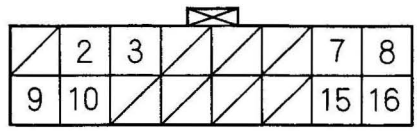
* 1: '99 model
* 2: '00-02 models

BACK

Protected by AR

Navigation Unit Inputs and Outputs for Connector B (16P) ('03 Model)

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
2	BRN/WHT	SH AUD	Shield route guidance	Shield for terminal No. 1, 9, 10
3	WHT/BLK	MUTE	Mute	Audio mute signal
7	BLU/GRN	DISP BUS (+)	Display bus positive	Data bus (+)
8	RED/BLK	ILL+	Illumination positive	Parking light ON signal
9	WHT	AUD L+	Route guidance left positive	Left audio signal of voice guidance
10	BLK	GND AUD	Ground route guidance	Ground for voice guidance signal
15	ORN/BLU	DISP BUS (−)	Display bus negative	Data bus (−)
16	LT BLU	SH DISP BUS	Shield display bus	Shield for terminal No. 7, 15

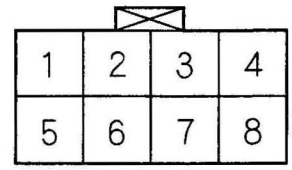
(cont'd)

Protected by AR

System Description (cont'd)

Navigation Unit Inputs and Outputs for Connector C (8P)

NAVIGATION UNIT CONNECTOR C (8P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
1	RED/YEL	+B	+B power source	Countinuous power source
2	WHT/BLK * 1 YEL/BLK * 2	ACC	Accessory	Power source for accessory
3	WHT/BLU	CHG	Charge	Engine ON signal
4	BLK	GND	Ground	Ground for navigation unit
5	GRN/BLK	BACK LT	Back light	Reverse signal of select lever
6	BLU/WHT	VSP	Vehicle speed pulse	Vehicle speed signal
7	GRN/RED	DIAG P	Diagnosis positive	Service check signal for navigation system
8	BLU/GRN	DIAG N	Diagnosis negative	Ground for service check signal

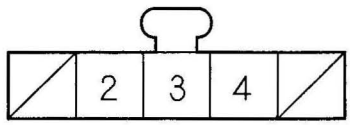
* 1: '99 model
* 2: '00-03 models

BACK

Protected by AR

Display Unit Inputs and Outputs for Connector A (5P)

DISPLAY UNIT CONNECTOR A (5P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
2	LT GRN/ WHT	CLK2	Clock 2	Air conditioning control unit synchronizing signal
3	LT GRN/ BLK	ACI	Air conditioner in	Communication circuit with climate control unit
4	LT GRN/ RED	ACO	Air conditioner out	

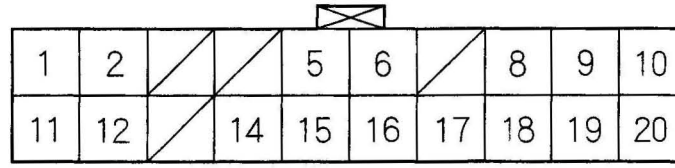
(cont'd)

Protected by AR

System Description (cont'd)

Display Unit Inputs and Outputs for Connector B (20P)

DISPLAY UNIT CONNECTOR B (20P)



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
1	RED/YEL	+B	+B power source	Continuous power source
2	WHT/BLK *1 YEL/BLK *2	ACC	Accessory	Power source for accessory
5	BLU/GRN	DISP BUS (+)	Display bus positive	Data bus (+)
6	BLU	SCTY1	Security 1	Security signal
8	WHT	R SIG	Red signal	Red color signal
9	RED	G SIG	Green signal	Green color signal
10	BLK	GND	Ground	Ground for display unit
11	RED/BLK	ILL+	Illumination positive	Parking light ON signal
12	RED	ILL−	Illumination negative	Parking light ON signal
14	LT BLU	SH DISP BUS	Shield display bus	Shield for display bus
15	ORN/BLU	DISP BUS (−)	Display bus negative	Data bus (−)
16	GRN/WHT	SCTY2	Security 2	Security signal
17	BLU	GND SIG	Ground signal	Ground for color signal
18	YEL	B SIG	Blue signal	Blue color signal
19	GRN	C SIG	Composite signal	Composite video (vertical/ horizontal) synchronizing signal
20	BRN/BLK	SH SIG	Shield signal	Shield for terminal No. 8, 9, 17, 18, 19

* 1: '99 model
* 2: '00-03 models

BACK

Protected by AR

Overview

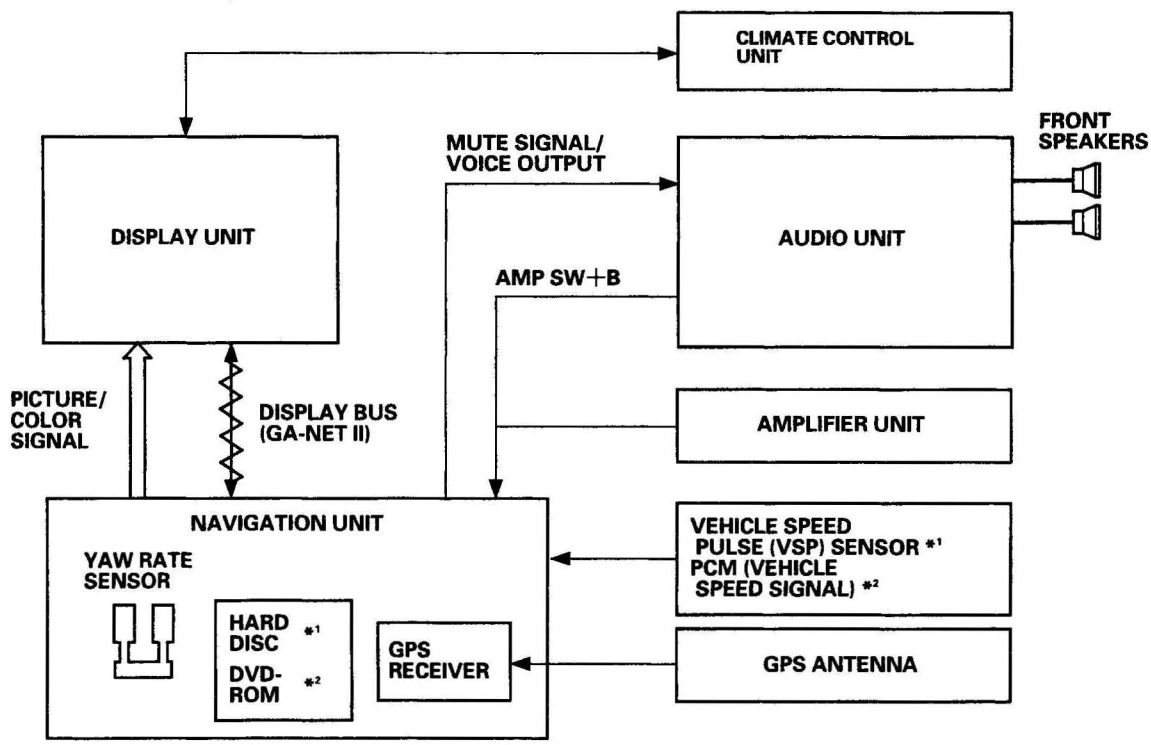
The Acura Navigation System is a highly-sophisticated, hybrid locating system that uses satellites and a map database to show you where you are and to help guide you to a desired destination.

The navigation system receives signals from the Global Positioning System (GPS), a network of 24 satellites in orbit around the earth. By receiving signals from serveral of these satellites, the Navigation System can determine the latitude and longitude of the vehicle. In addition, signals from the system's yaw rate sensor, the vehicle speed pulse (VSP) sensor * [1] or PCM (vehicle speed signal) * [2] enable the system to keep track of the vehicle's direction and speed of travel.

This hybrid system has advantages over a system that is either entirely self-contained or one that relies totally on the GPS. For example, the self-contained portion of the system can keep track of vehicle position even when satellite signals cannot be received, and the GPS can keep track of the vehicle position even when the vehicle is transported by ferry.

The navigation system applies all this location, direction, and speed information to the maps and calculates a route to the destination entered. As you drive to that destination, the system provides both visual and audio guidance.

System Diagram ('99-02 Models)



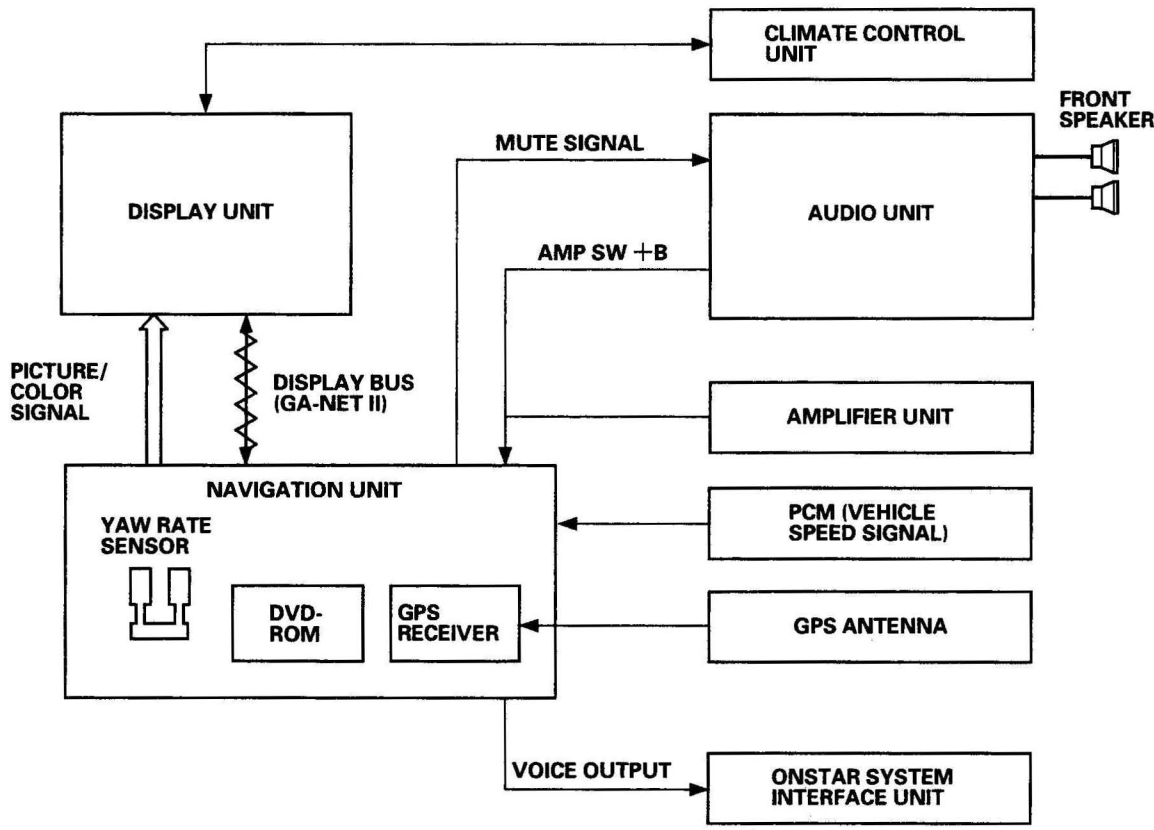
*1: '99 model
*2: '00-02 models

(cont'd)

Protected by AR

System Description (cont'd)

System Diagram ('03 Model)



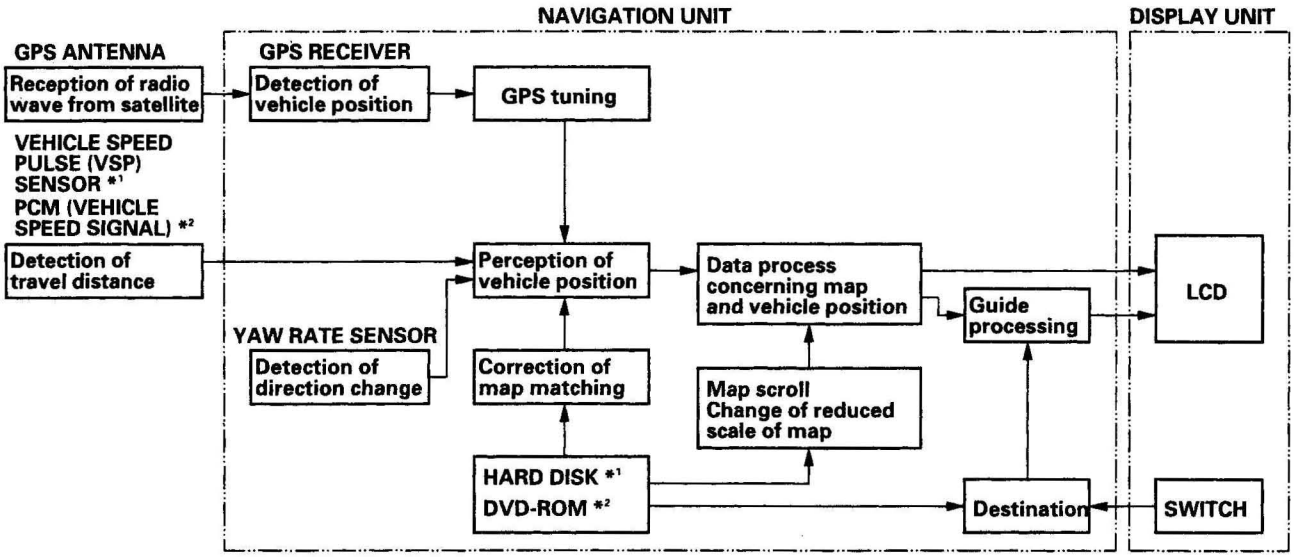
BACK

Protected by AR

Navigation Function

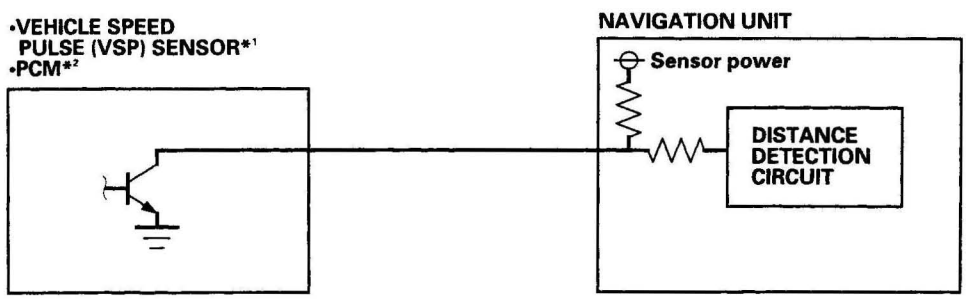
The navigation system is composed of the navigation unit, the vehicle speed pulse (VSP) sensor *1, PCM (vehicle speed signal) *2, the GPS antenna, and the display unit.

Function Diagram



Vehicle Speed Pulse Signal

The vehicle speed pulse signal is outputted by the vehicle speed pulse (VSP) sensor *1 or PCM *2. The VSP sensor is driven by the differential gear. For every revolution of the sensor, a four-pulse signal is sent to the navigation unit. The PCM receives the signal which is outputted by the counter shaft speed sensor, then the PCM process the signal and transmit the signal to the speedometer and other system.



*1: '99 model
*2: '00-03 models

(cont'd)

Protected by AR

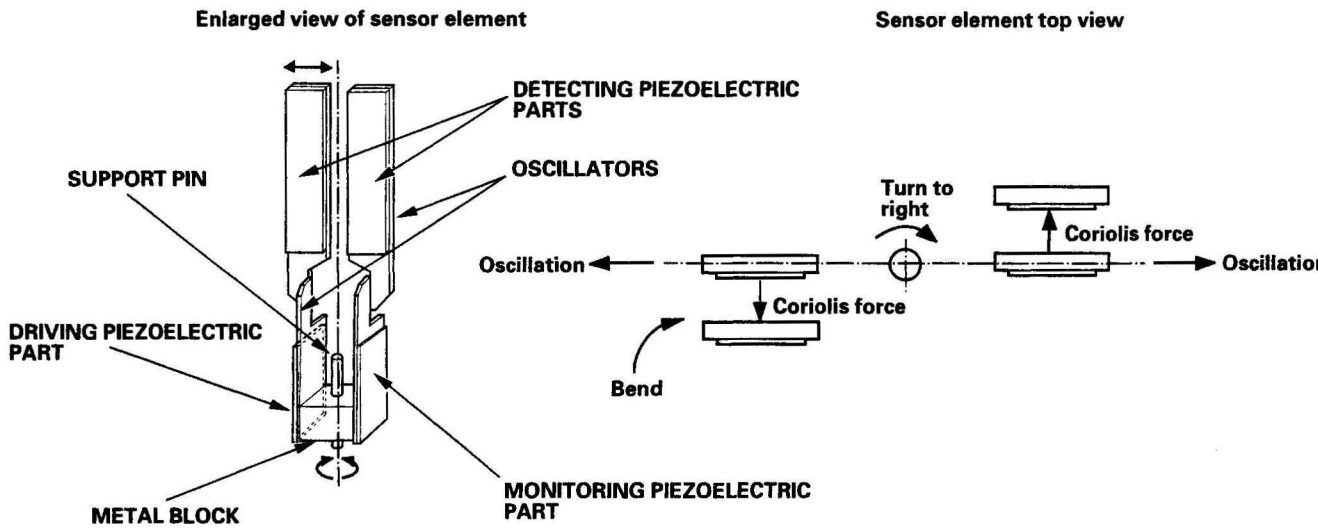
System Description (cont'd)

Yaw Rate Sensor
The yaw rate sensor detects the direction change (angular speed) of the vehicle. The sensor is an oscillation gyro built into the navigation unit.

Sensor Element Structure
The sensor element is shaped like a tuning fork, and it consists of the piezoelectric parts, the metal block, and the support pin. There are four piezoelectric parts: one to drive the oscillators, one to monitor and maintain the oscillation at a regular frequency, and two to detect angular velocity. The two oscillators have a 90 degree twist in the center, are connected at the bottom by the metal block, and supported by the support pin. A detection piezoelectric part is attached to the top of each oscillator. The driving piezoelectric part is attached to the bottom of one oscillator, and the monitoring piezoelectric part is attached to the bottom of the other oscillator.

Oscillation Gyro Principles
The piezoelectric parts have "electric/mechanical transfer characteristics." They bend vertically when voltage is applied to both sides of the parts, and voltage is generated between both sides of the piezoelectoric parts when they are bent by an external force. The oscillation gyro functions by utilizing this characteristic of the piezoelectric parts and "Coriolis force." (Coriolis force deflects moving objects as a result of the earth's rotation.) In the oscillation gyro, this force moves the sensor element when angular velocity is applied.

Operation
1. The driving piezoelectric part oscillates the oscillator by repeatedly bending and returning when an AC voltage of 6 kHz is applied to the part, The monitoring-side oscillator resonates because it is connected to the driving-side oscillator by the metal block.
2. The monitoring piezoelectric part bends in proportion to the oscillation and outputs voltage (the monitor signal). The navigation unit control circuit controls the drive signal to stabilize the monitor signal.
3. When the vehicle is stopped, the detecting piezoelectric parts oscillate right and left with the oscillators, but no signal is output because the parts are not bent (no angular force)
4. When the vehicle turns to the right, the sensor element moves in a circular motion with the right oscillator bending for ward and the left oscillator bending rearward. The amount of forward/rearward bend varies according to the angular velocity of the vehicle.
5. The detecting piezoelectric parts output voltage (the yaw rate signal) according to the amount of bend. The amount of vehicle direction change is determined by measuring this voltage.



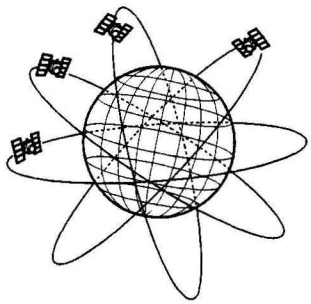
BACK

Protected by AR

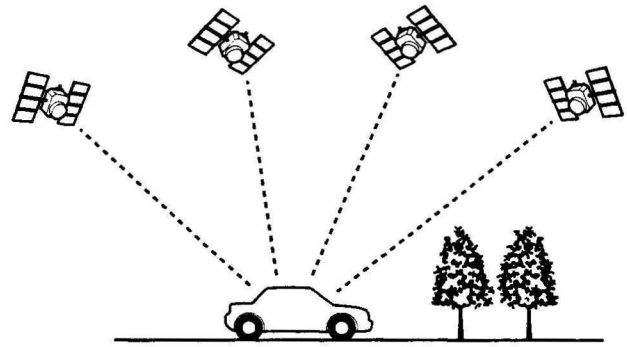
Global Positioning System (GPS)

The Global Positioning System (GPS) enables the navigation system to determine the current position of the vehicle by using the electronic waves transmitted from the satellites in orbit around the earth. The satellites transmit the satellite identification signal, orbit information, transmission time signal, and other information. When the GPS receiver receives the electronic waves from three or more satellites simultaneously, it calculates the current position of the vehicle based on the distance to each satellite and the satellite positions on their respective orbits.

Position detection Image with GPS satellite



NOTE: Four satellites on each of 6 orbits.



Precision of GPS

The precision of the GPS varies according to the number of satellites from which electric waves are received and the control condition. The precision is indicated by the GPS mark shown on the upper left of the display.

GPS MARK	No.of SATELLITES	CONDITION	DISCRIPTION
No satellite icon → 	2 or less	Impossible to detect vehicle position	GPS function is normal. The satellite electronic waves that are received by the GPS receiver are too few to determine the vehicle position.
Yellow satellite icon → 	3	Vehicle position detectable in 2 demensions	The longitude and latitude of the vehicle position can be determined. (Less precise than detection in three determined)
Green satellite icon → 	4 or more	Vehicle position detectable in 3 dimensions	The longitude, latitude and the altitude of the vehicle position can be determined. (More precise than detection in two dimensions)
Not indicate	——	Faulty	The GPS can't be used due to a faulty GPS receiver, open in the antenna wire, disconnected antenna or other fault.

GPS Antenna

The GPS antenna amplifies and transmits the electronic waves from the satellites to the GPS receiver.

GPS Receiver

The GPS receiver is built in the navigation unit. It calculates the vehicle position by receiving the signal from the GPS antenna. The vehicle position and signal reception condition is transmitted from the GPS receiver to the navigation control unit to adjust vehicle position.

(cont'd)

Protected by AR

System Description (cont'd)

Navigation Unit
The navigation unit calculates the vehicle position and guides you to the destination. The unit performs map matching correction, GPS correction, and distance tuning. It also controls the menu functions and the DVD-ROM drive ('00-01 models) or hard disk drive ('99 model). With control of all these items, the navigation unit makes the navigation picture signal, then it transmits the signal to the display unit and audio driving instructions to the audio unit.

Calculation of Vehicle Position
The navigation unit calculates the vehicle position (the driving direction and the current position) by receiving the directional change signals from the yaw rate sensor and the travel distance signals from the vehicle speed pulse (VSP) sensor or the PCM.

Map Matching Tuning
The map matching tuning is accomplished by indicating the vehicle position on the roads on the map. The map data transmitted from the hard disk ('99 model) or DVD-ROM ('00-01 models) is checked against the vehicle position data, and the vehicle position is indicated on the nearest road. Map matching tuning does not occur when the vehicle travels on a road not shown on the map or when the vehicle position is far away from a road on the map.

GPS Tuning
The GPS tuning is accomplished by indcating the vehicle position as the GPS's vehicle position. The navigation unit comprares its calculated vehicle position data with the GPS vehicle position data. If there is large difference between the two, the indicated vehicle position is adjusted to the GPS vehicle position.

Distance Tuning
The distance tuning reduces the difference between the travel distance signal from the VSP ('99 model) or PCM ('00-01 models) and the distance data on the map. The navigation unit compares its calculated vehicle position data with the GPS vehicle position data. The navigation unit then decreases the tuning value when the vehicle position is always ahead of the GPS vehicle position, and it increases the tuning value when the vehicle position is always behind the GPS vehicle position.

Route Guidance
The navigation unit can calculate different routes to a selected destination. You have four options:
- Direct Route — Calculate a route that is the most direct and will take the least time.
- Easy Route — Calcute a route that minimizes the number of turns needed.
- Minimize Freeways — Calculate a route that avoids freeway travel. If that is not possible, keep the amount of freeway travel to a minimum.
- Mimimize Toll Roads — Calculate a route that avoids, or minimizes travel on toll roads

Audio Guidance
The navigation unit transmits audio driving instructions before entering an intersection or passing a junction. The audio instructions come through the audio unit and the front speakers.

DVD-ROM ('99 model: Hard Disk)
The map data (including all scale rates) is stored in the DVD-ROM. The map data includes:
- Road distances, road widths, speed limits, traffic regulations, passing time at junction, distances to junctions, and the driving instructions for audio guidance.
- Latitude and longitude GPS
- Points of Interest (POI) data base.

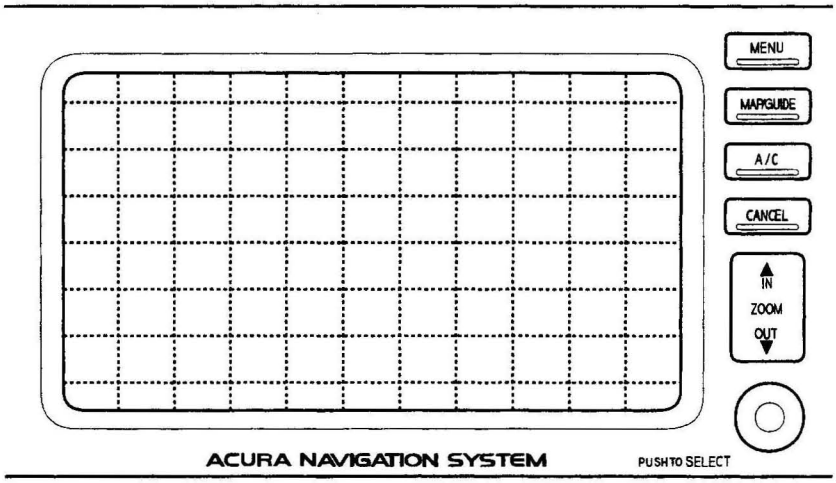
BACK

Protected by AR

Audio Unit
The audio unit receives the audio driving instructions from the navigation unit and transmits the instructions through the front speakers even when the audio system is in use.

Display Unit
The display unit uses liquid crystal display (LCD). The LCD is a 6-inch-wide, thin film transistor (TFT), stripe type with 280,800 picture elements, The color film and fluorescent light are laid out on the back of the liquid crystal film. The touch sensor on the front of the LCD is an infrared type with 10 vertical and 7 horizontal infrared rays to produce 70 sensing points. The display unit transmits the signal from each operation key and the touch switches to the navigation unit.

Infrared rays



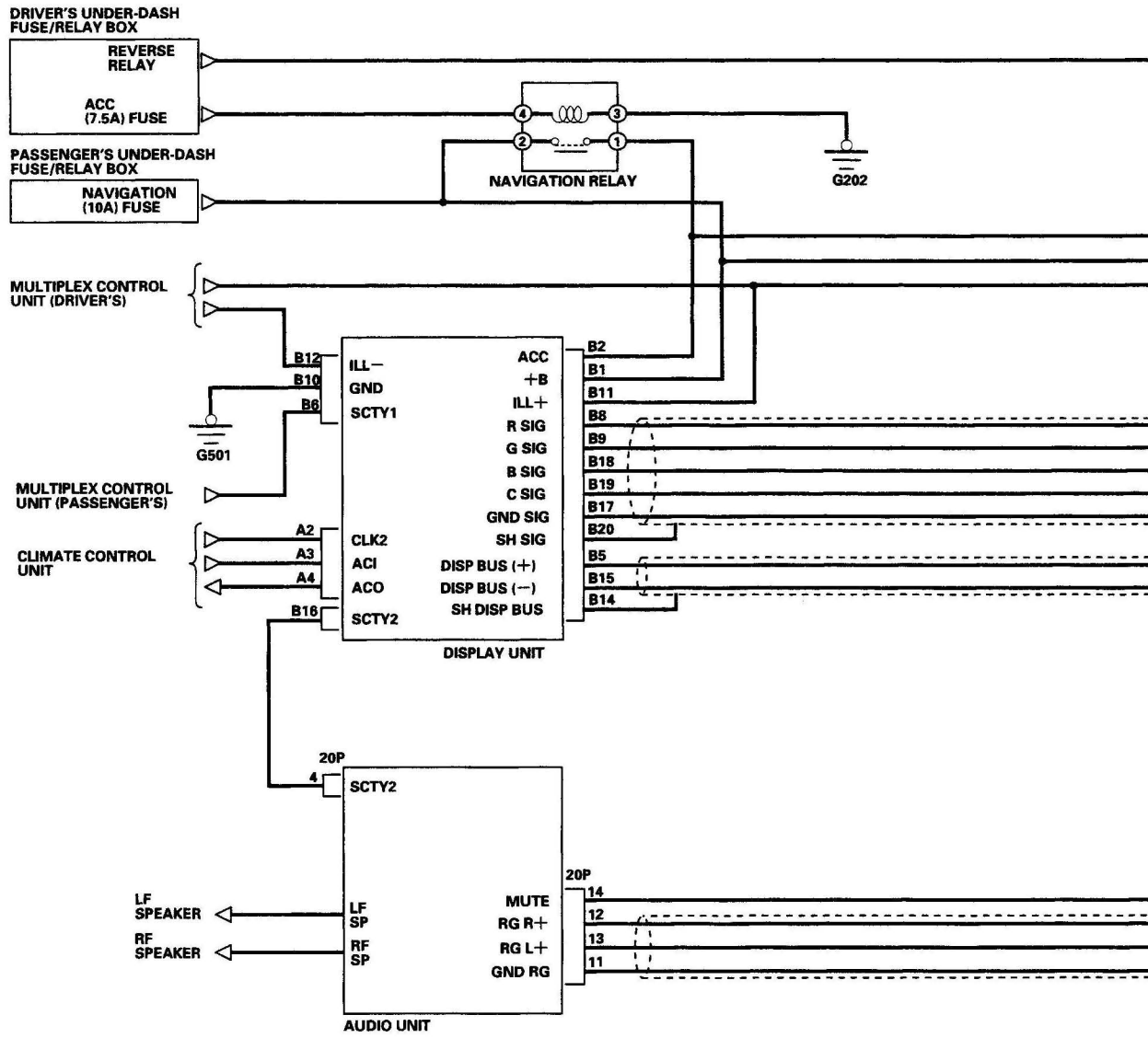
····· : **Infrared for touch switch**

Protected by AR

Navigation System

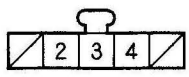
Circuit Diagram

'99 model:

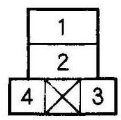


DISPLAY UNIT CONNECTORS

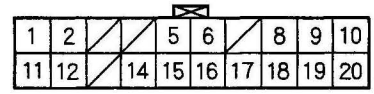
CONNECTOR A (5P)



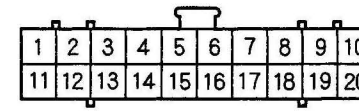
NAVIGATION RELAY 4P CONNECTOR



CONNECTOR B (20P)



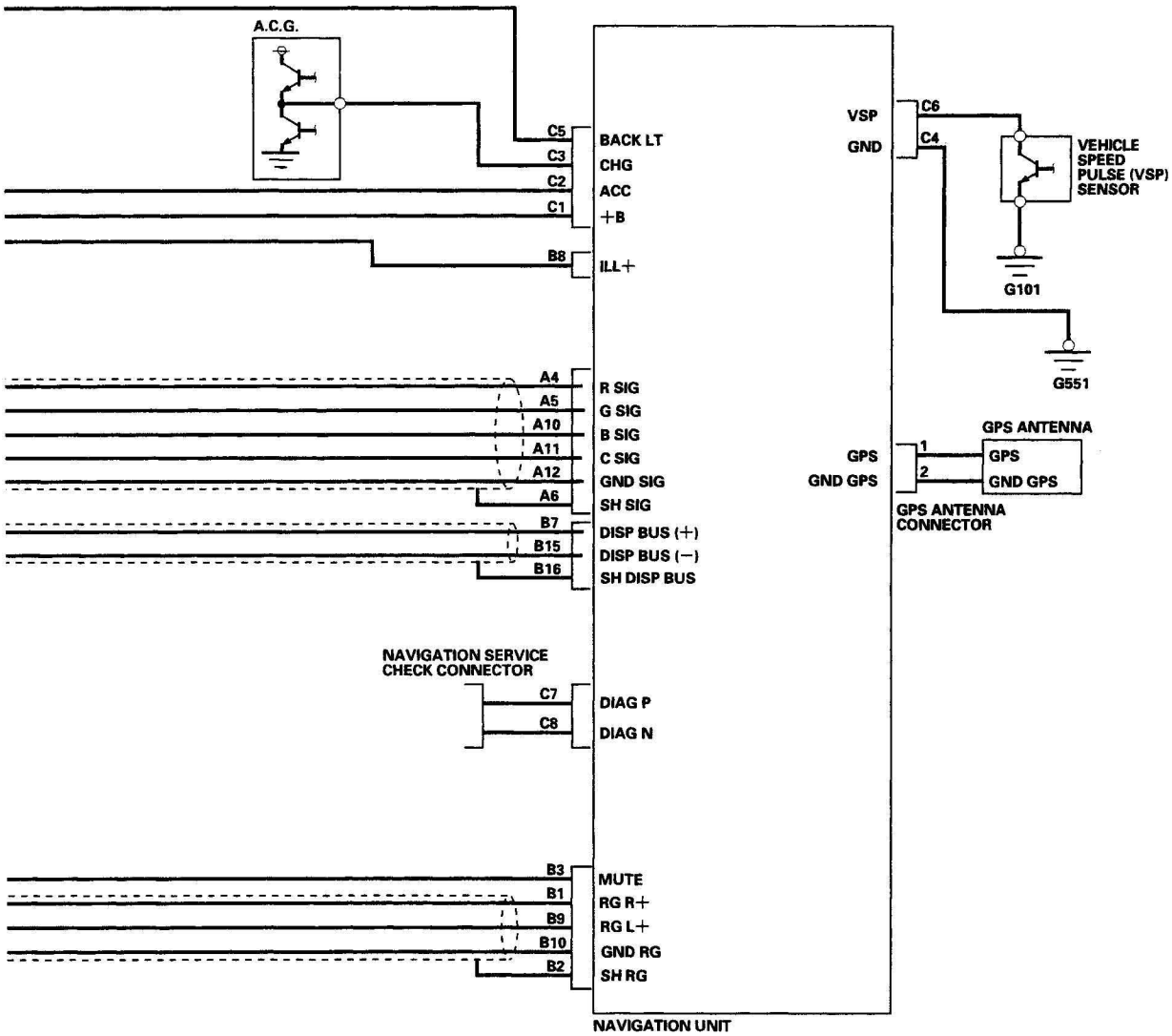
AUDIO UNIT 20P CONNECTOR



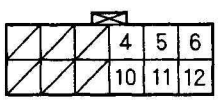
Wire side of female terminals

BACK

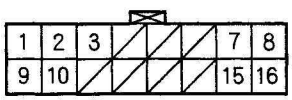
Protected by AR



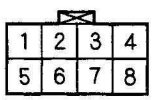
CONNECTOR A (12P)



CONNECTOR B (16P)



CONNECTOR C (8P)



GPS ANTENNA CONNECTOR



NAVIGATION SERVICE CHECK CONNECTOR

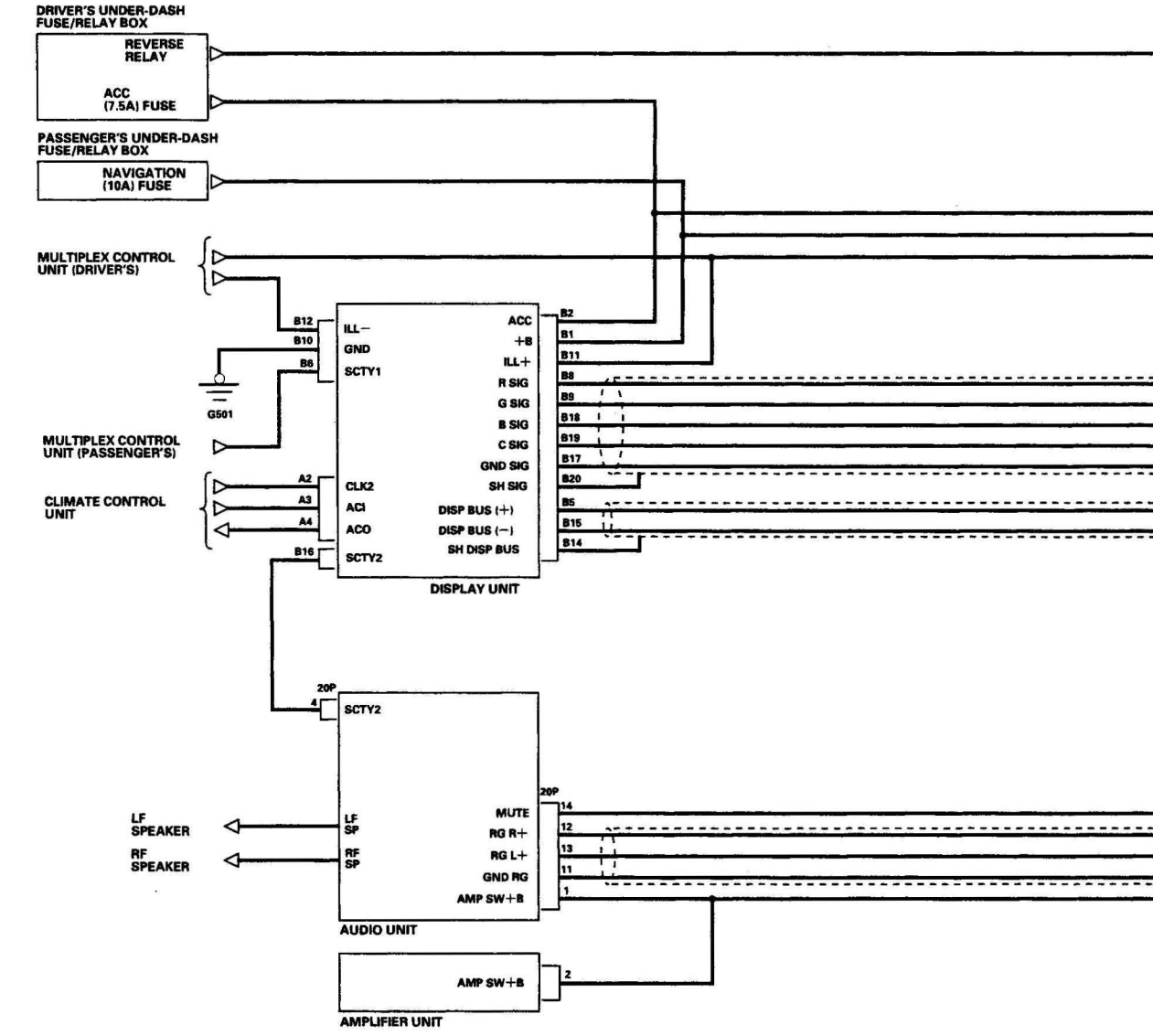


Wire side of female terminals

Protected by AR

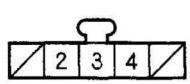
Circuit Diagram (cont'd)

'00-02 models:

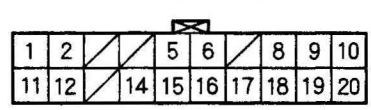


DISPLAY UNIT CONNECTORS

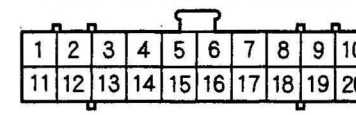
CONNECTOR A (5P)



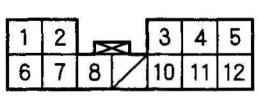
CONNECTOR B (20P)



AUDIO UNIT 20P CONNECTOR



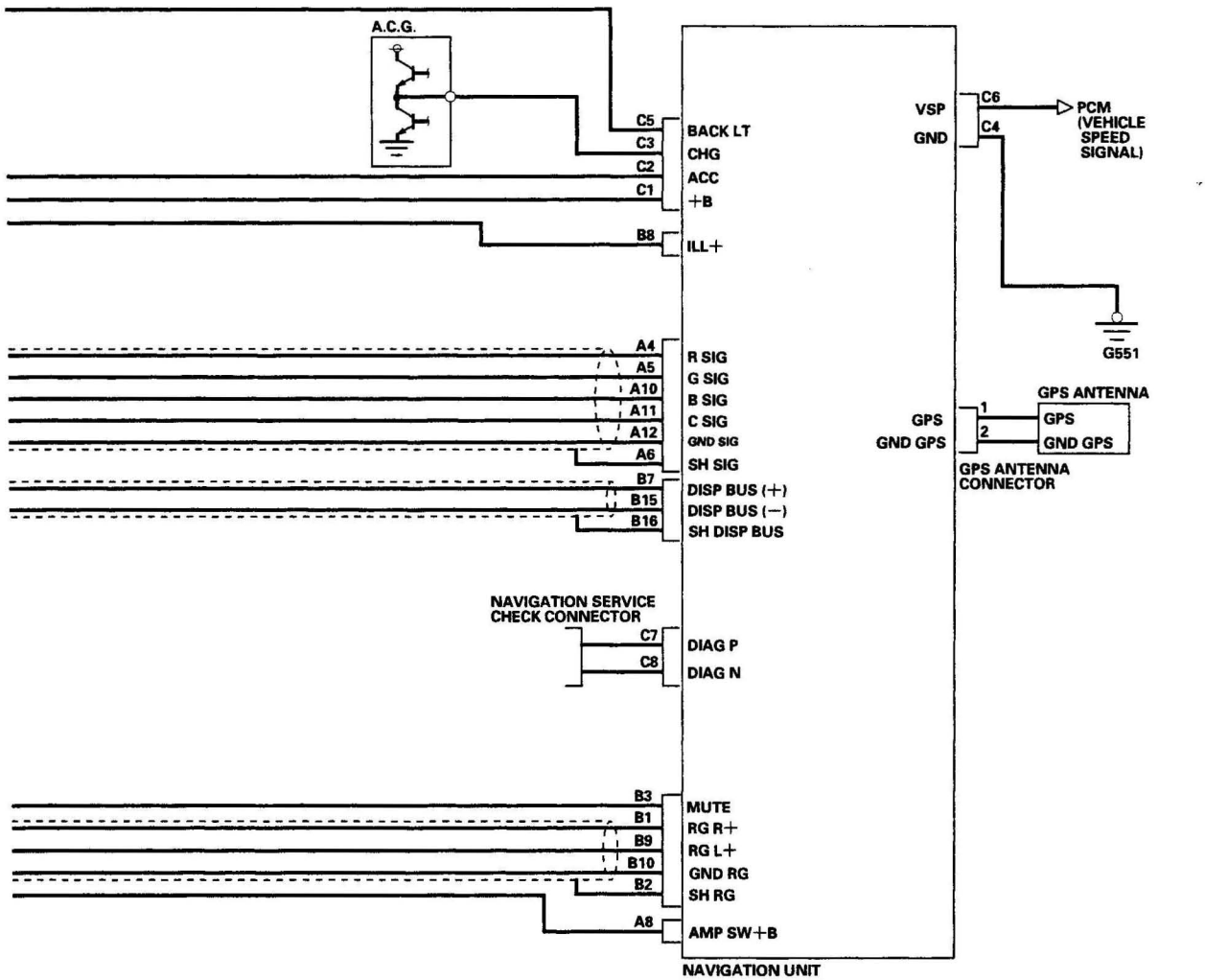
AMPLIFIER UNIT 12P CONNECTOR



Wire side of female terminals

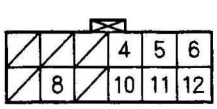
BACK

Protected by AR

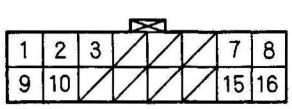


NAVIGATION UNIT CONNECTORS

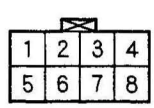
CONNECTOR A (12P)



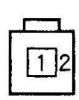
CONNECTOR B (16P)



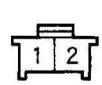
CONNECTOR C (16P)



GPS ANTENNA CONNECTOR



NAVIGATION SERVICE CHECK CONNECTOR



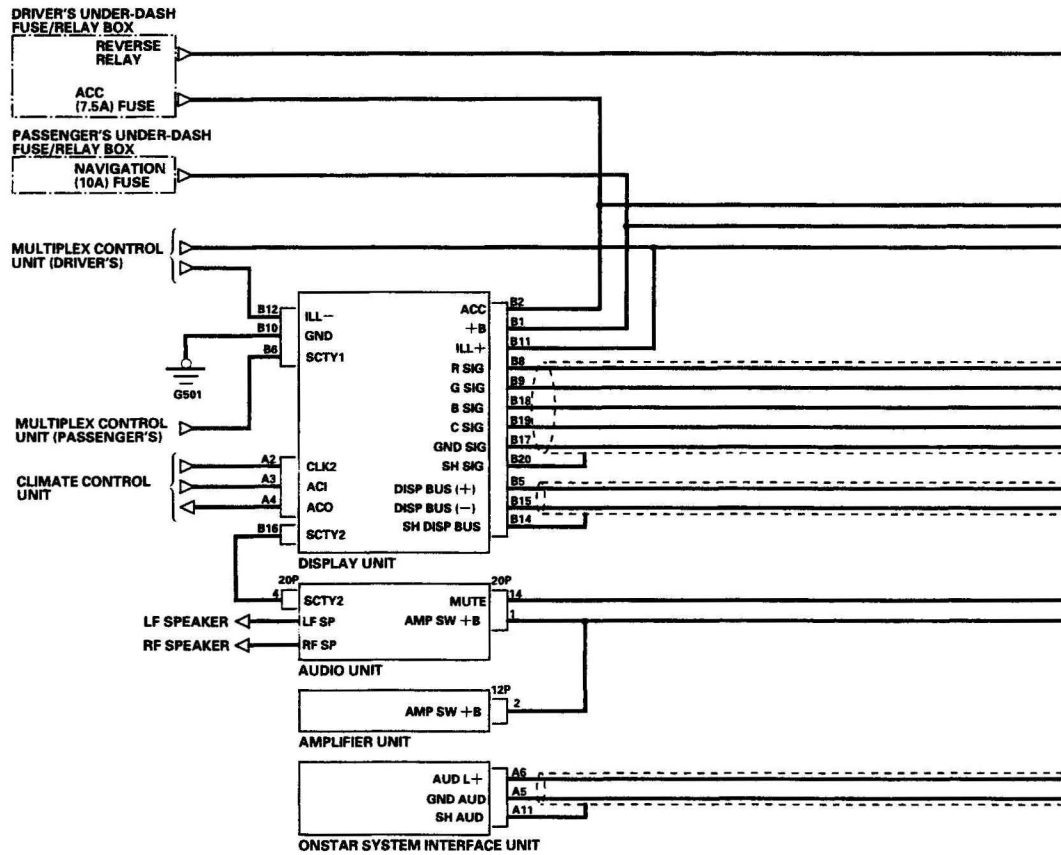
Wire side of female terminals

BACK

Protected by AR

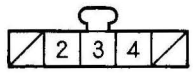
Circuit Diagram (cont'd)

'03 model:

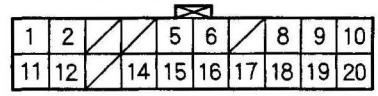


DISPLAY UNIT CONNECTORS

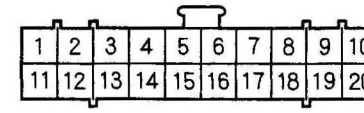
CONNECTOR A (5P)



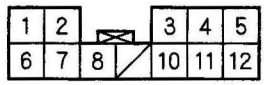
CONNECTOR B (20P)



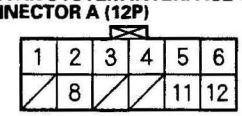
AUDIO UNIT 20P CONNECTOR



AMPLIFIER UNIT 12P CONNECTOR



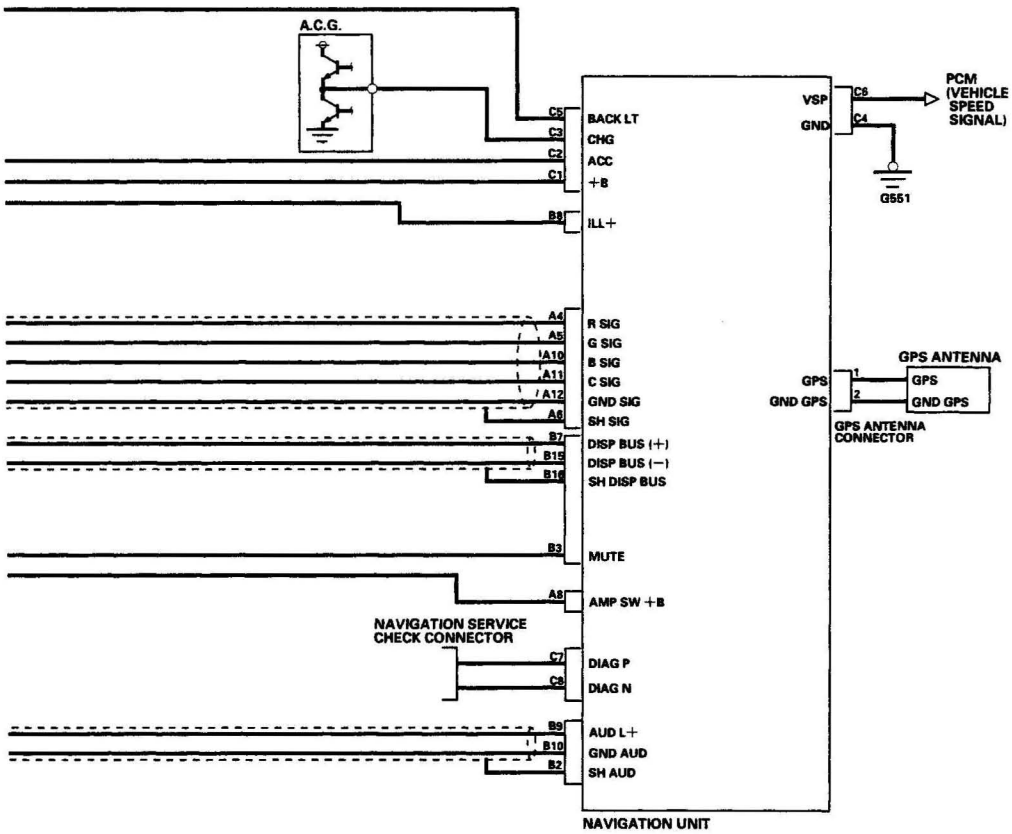
ONSTAR SYSTEM INTERFACE UNIT CONNECTOR A (12P)

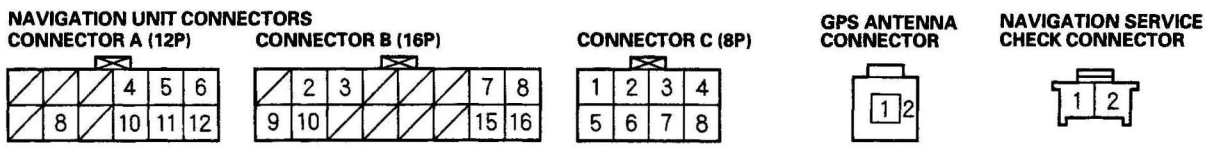


Wire side of female terminals

BACK

Protected by AR





Wire side of female terminals

Protected by AR

Symptom Troubleshooting

Special Tool Required:
Test Harness 07LAJ-PT3020A

No picture is shown on the display

1. Check the NAVIGATION (10A) fuse in the passenger's under-dash fuse relay box, and reinstall the fuse if it is OK.

   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the fuse and recheck. ■

2. Check the ACC (7.5A) fuse in the Driver's under-dash fuse relay box, and reinstall the fuse if it is OK.

   Is the fuse OK?

   YES – '99 model, go to step 3.
   '00-03 models, go to step 6.

   NO – Replace the fuse and recheck. ■

3. Check the NAVIGATION relay, and remove the relay if it is OK.

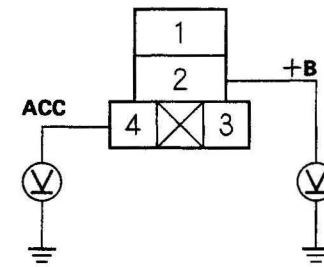
   Is the relay OK?

   YES – Go to step 4.

   NO – Replace the relay. ■

4. Measure the voltage between body ground and Navigation relay connector (4P) No. 2 and No. 4 individually.

NAVIGATION RELAY 4P CONNECTOR



Wire side of female terminals

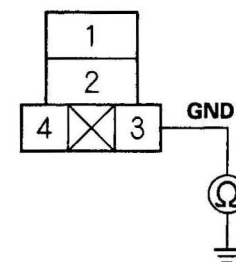
Is there battery voltage?

YES – Go to step 5.

NO – Repair open in the wire between the passenger's and driver's under-dash fuse relay box and the navigation relay.

5. Check for continuity between navigation relay connector (4P) terminal No. 3 and body ground.

NAVIGATION RELAY 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Go to step 6.

NO – Repair open in the wire between the navigation relayand body ground (G202). ■.

6. Reinstall the NAVIGATION relay.

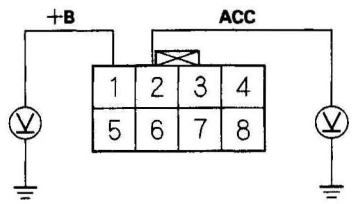
BACK

Protected by AR

7. Turn the ignition switch ON (II).

8. Measure the voltage between body ground and navigation unit connector C (8P) terminals No. 1 and No. 2 individually.

NAVIGATION UNIT CONNECTOR C (8P)



Wire side of female terminals

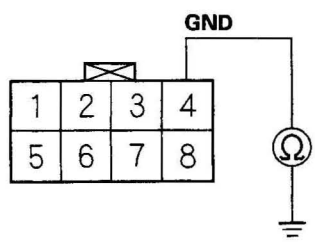
Is there battery voltage?

YES – Go to step 9.

NO – If the RED/YEL wire does not have voltage, repair the open in the wire between the passenger's under-dash fuse/relay box and the navigation unit. ■
If the YEL/BLK wire does not have voltage, repair the open in the wire between the driver's under-dash fuse/relay box and the navigation unit. ■

9. Check for continuity between navigation unit connector C (8P) terminal No. 4 and body ground.

NAVIGATION UNIT CONNECTOR C (8P)



Wire side of female terminals

Is there continuity?

YES – Go to step 10.

NO – Repair open in the wire between the navigation unit and body ground (G603). ■

10. Turn the ignition switch OFF.

11. Perform the forced starting of the display (see page 22-431).

Is the diagnosis menu of the picture diagnosis displayed?

YES – Perform the System Links Test in the Picture Diagnosis Test menu (see page 22-426).

NO – Go to step 12.

12. Shield the display unit from the sun with your hand, and check that the display is black (only back light is ON.)

Can you see the back light?

YES – Replace the navigation unit (see page 22-433). ■

NO – Replace the display unit (see page 22-434). ■

(cont'd)

Protected by AR

Symptom Troubleshooting (cont'd)

The picture is missing a Red, Green or Blue color or tone

1. Perform the start-up procedure (see page 22-426).
2. Press the Monitor Check button then press the RGB Color button (see page 22-428).

   Are the Red, Green, and Blue colored circles shown?

   YES – Push the return button. Push the Color Change button, and then press the Default button to restore the standard color settings. ■

   NO – Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the navigation unit connector A (12P) from the control unit, and the display unit connector B (20P) from the display.
5. Check for loose terminals at the navigation unit connector A (12P) and display unit connector B (20P).

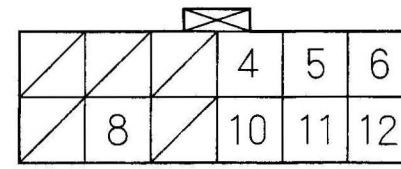
   Are ther loose terminals?

   YES – Repair the terminal(s).

   NO – Go to step 6.
6. Check for continuity between the appropriate pins of the navigation unit connector A (12P) to the display unit connector B (20P) based on the missing color(s).

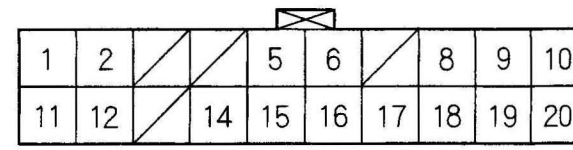
Missing color	Navigation unit connector A (12P)	Display unit connector B (20P)	Wire color
Blue	A10	B18	YEL
Green	A5	B9	RED
Red	A4	B8	WHT

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

DISPLAY UNIT CONNECTOR B (20P)



Wire side of female terminals

Is there continuity?

YES – Go to step 7.

NO – There is open in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

BACK

Protected by AR

7. Check for continuity between the appropriate pins of the navigation unit connector A (12P) and display unit connector B (20P) based on the missing color(s).

Missing color	Navigation unit connector A (12P)	Display unit connector B (20P)
Blue	A10	B10,B20
Green	A5	B10,B20
Red	A4	B10,B20

Is there continuity?

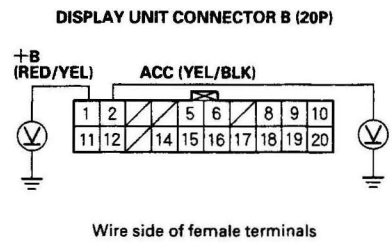
YES – There is a short to body ground in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

NO – Replace the navigation unit. ■

Display unit buttons do not work

NOTE: Always check all of the connectors for loose terminals.

1. Turn the ignition switch to ACC (I).
2. Measure the voltage betwen body ground and display unit connector B (20P) terminals No. 1 and No. 2 individually.



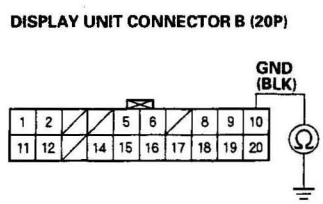
Wire side of female terminals

Is there battery voltage?

YES – Go to step 3.

NO – If the RED/YEL wire does not have voltage, repair the open in the wire between the passenger's under-dash fuse/relay box and the display unit. ■ If the YEL/BLK wire does not have voltage, repair the open in the wire between the driver's under-dash fuse/relay box and the display unit. ■

3. Check for continuity between display unit connector B (20P) terminal No. 10 and body ground.



Wire side of female terminals

Is there continuity?

YES – Go to step 4.

NO – Repair the open in the wire between the display unit and body ground (G501). ■

(cont'd)

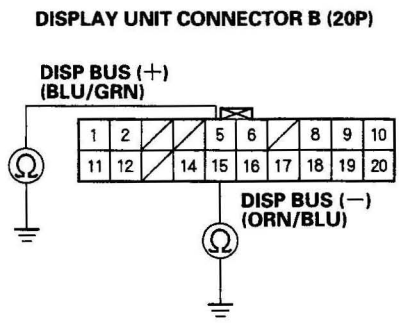
Protected by AR

Symptom Troubleshooting (cont'd)

4. Turn the ignition switch OFF.

5. Disconnect the navigation unit and display unit connectors.

6. Check for continuity between body ground and display unit connector B (20P) terminals No. 5 and No. 15 individually.



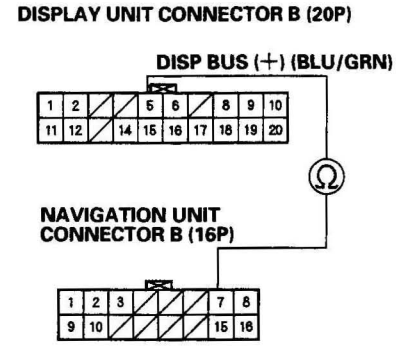
Wire side of female terminals

Is there continuity?

YES—There is a short to body ground in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

NO—Go to step 7.

7. Check for continuity between display unit connector B (20P) terminal No. 5 and navigation unit connector B (16P) terminal No. 7.



Wire side of female terminals

Is there continuity?

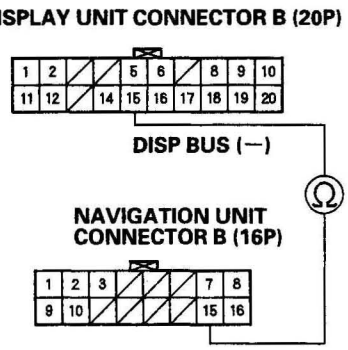
YES—Go to step 8.

NO—There is an open in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

BACK

Protected by AR

8. Check for continuity between display unit connector B (20P) terminal No. 15 and navigtion unit 16P connector B (16P) terminal No. 15.



Wire side of female terminals

Is there continuity?

YES—Replace the display unit (see page 22-434). ■

NO—There is an open in the circuit between the display unit and the navigation unit. Replace the affected shielded harness. ■

GPS satellite icon is not indicated

1. Check the rear window.

   Is there window tint applied to the rear window that contains any metallic content?

   YES—Swap a known-good navigation unit that was verified displaying a green satellite icon. If a satellite icon is still not indicated, remove the window tint and recheck. ■

   NO—Go to step 2.

2. Check for electronic aftermarket accessories (possibly hidden), mounted near the GPS antenna or the navigation unit.

   Are there any electronic accessories?

   YES—Disable the accessories and recheck. ■

   NO—Go to step 3.

3. Perform the "System Link" check under picture diagnosis (see page 22-426).

   Is "NG" indicated?

   YES—Repair as indicated by the system link check. ■

   NO—Check that nothing is blocking the GPS antenna located under the package shelf and recheck where nothing can block the GPS satellite signal. ■

(cont'd)

Protected by AR

Symptom Troubleshooting (cont'd)

Audio driving instructions cannot be heard ('99-02 Models)

NOTE: Perform steps 1–3 of Vehicle position does not move on the map. If the result is YES in step 3, do not replace the navigation unit, but return here and continue.

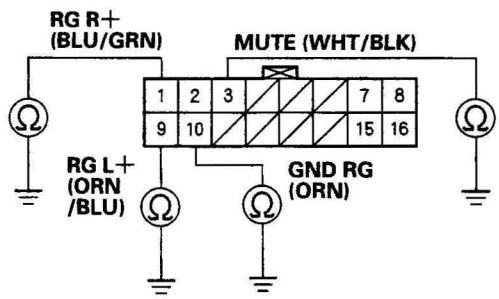
1. Push the display unit MENU key, and select "set-up".
2. Check the audio driving instructions volume setting.

   Is it set to OFF?

   YES—Set the volume to an audible level.■

   NO—Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the navigation unit 16P and the audio unit 20P connectors.
5. Check for continuity between body ground and navigation unit connector B (16P) terminals No. 1, No. 3, No. 9, and No. 10 individually.

NAVIGATION UNIT CONNECTOR B (20P)



Wire side of female terminals

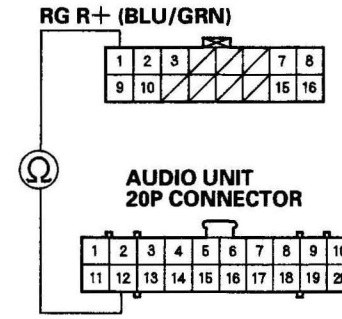
Is there continuity?

YES—If terminal No. 3 has continuity to ground, repair the short to body ground in the WHT/BLK wire.■
If terminal No. 1, No. 9, or No. 10 have continuity to ground, replace the affected shielded harness.■

NO—Go to step 6.

6. Check for continuity between navigation unit connector B (16P) terminal No. 1 and the audio unit 20P connector terminal No. 12.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

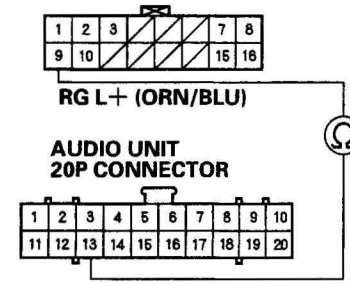
Is there continuity?

YES—Go to step 7.

NO—There is an open in the circuit between the navigation unit and the audio unit. Replace the affected shielded harness.■

7. Check for continuity between navigation unit connector B (16P) terminal No. 9 and the audio unit 20P connector terminal No. 13.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES—Go to step 8.

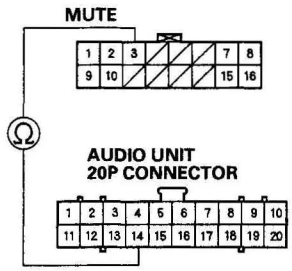
NO—There is an open in the circuit between the navigation unit and the audio unit. Replace the affected shielded harness.■

BACK

Protected by AR

8. Check for continuity between navigation unit B (16P) connector terminal No. 3 and the audio unit 20P connector terminal No. 14.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

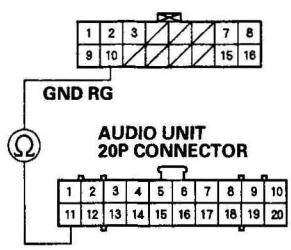
Is there continuity?

YES – Go to step 9.

NO – Repair open in the wire between the navigation unit and the audio unit. ■

9. Check for continuity between navigation unit B (16P) connector terminal No. 10 and the audio unit 20P connector terminal No. 11.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

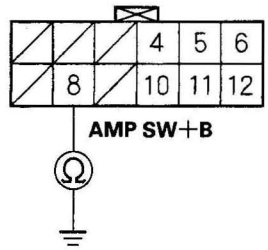
YES – '99 model, go to step 14.
'00-02 models, go to step 10.

NO – There is an open in the circuit between the navigation unit and the audio unit. Replace the affected shielded harness. ■

10. Disconnect the navigation unit 12P and the Amplifier unit 12P connector.

11. Check for continuity between body ground and navigation unit connector A (12P) terminals No. 8.

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

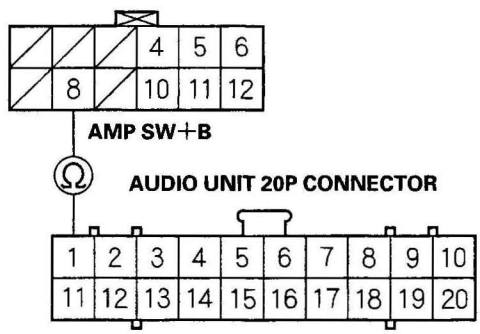
Is there continuity?

YES – Repair short to body ground in the wire between the navigation unit, the audio unit and amplifier unit. ■

NO – Go to step 12.

12. Check for the continuity between navigation unit A (12P) connector terminal No. 8 and the audio unit 20P connector terminal No. 1.

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

Is there continuity?

YES – Go to step 13.

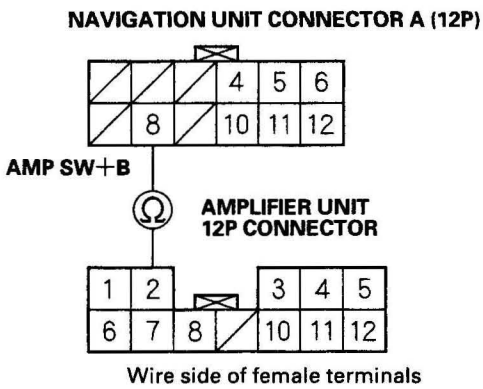
NO – Repair open in the wire between the navigation unit and the audio unit. ■

(cont'd)

Protected by AR

Symptom Troubleshooting (cont'd)

13. Check for continuity between navigation unit A (12P) connector terminal No. 8 and the amplifier unit 12P connector terminal No. 2.



Wire side of female terminals

Is there continuity?

YES – Go to step 14.

NO – Repair open in the wire between the navigation unit and the amplifier unit. ■

14. Substitute a known-good audio unit and recheck.

Is the system OK?

YES – Replace the audio unit (see page 22-202). ■

NO – '99 model: Replace the navigation unit (see page 22-433). ■
'00-02 models: go to step 15.

15. Substitute a known-good amplifier unit and recheck.

Is the system OK?

YES – Replace the amplifier unit (see page 22-203). ■

NO – Replace the navigation unit (see page 22-433). ■

BACK

Protected by AR

Audio driving instructions cannot be heard ('03 Model)

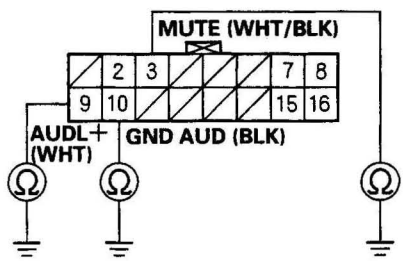
1. Push the display unit MENU key, and select "set-up".
2. Check the audio driving instructions volume setting.

   Is it set to OFF?

   YES – Set the volume to an audible level.■

   NO – Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the navigation unit connector B (16P), audio unit 20P connector, and onstar system interface unit connector A (12P).
5. Check for continuity between body ground and navigation unit connector B (16P) terminals No. 3, No. 9, and No. 10 individually.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

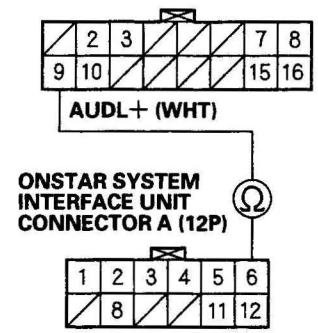
Is there continuity?

YES – If terminal No. 3 has continuity to ground, repair the short to body ground in the WHT/BLK wire.■
If terminal No. 9 or No. 10 have continuity to ground, replace the affected shielded harness.■

NO – Go to step 6.

6. Check for continuity between navigation unit connector B (16P) terminal No. 9 and the onstar system interface unit connector A (12P) terminal No. 6.

NAVIGATION UNIT CONNECTOR B (16P)



Wire side of female terminals

Is there continuity?

YES – Go to step 7.

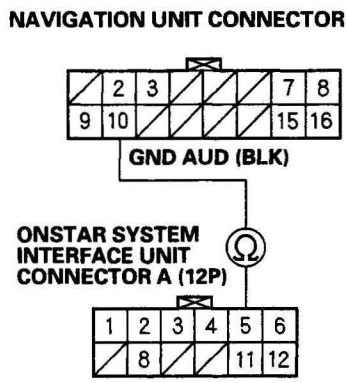
NO – There is an open in the circuit between the navigation unit and the onstar system interface unit. Replace the affected shielded harness.■

(cont'd)

Protected by AR

Symptom Troubleshooting (cont'd)

7. Check for continuity between navigation unit connector B (16P) terminal No. 10 and the onstar system interface unit connector A (12P) terminal No. 5.



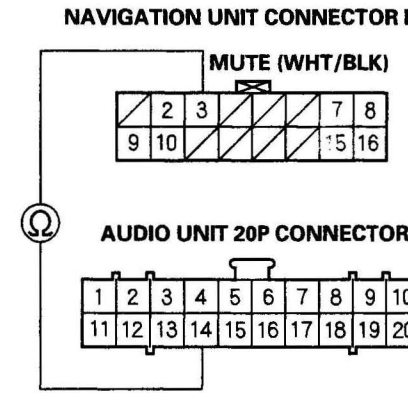
Wire side of female terminals

Is there continuity?

YES – Go to step 8.

NO – There is an open in the circuit between the navigation unit and onstar system interface unit. Replace the affected shielded harness. ■

8. Check for continuity between navigation unit connector B (16P) terminal No. 3 and the audio unit 20P connector terminal No. 14.



Wire side of female terminals

Is there continuity?

YES – Go to step 9.

NO – Repair open in the wire between the navigation unit and the audio unit. ■

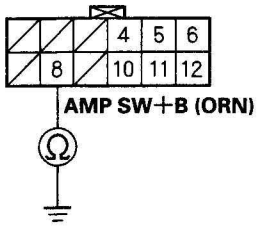
9. Disconnect the navigation unit connector A (12P) and amplifier unit 26P connector.

BACK

Protected by AR

10. Check for continuity between navigation unit connector A (12P) terminal No. 8 and body ground.

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

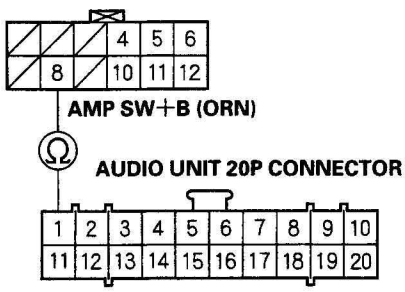
Is there continuity?

YES—Repair short to body ground in the wire between the navigation unit, the audio unit, and the amplifier unit.■

NO—Go to step 11.

11. Check for continuity between navigation unit connector A (12P) terminal No. 8 and the audio unit 20P connector terminal No. 1.

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

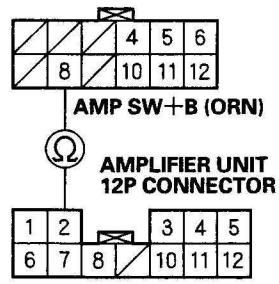
Is there continuity?

YES—Go to step 12.

NO—Repair open in the wire between the navigation unit and the audio unit.■

12. Check for continuity between navigation unit connector A (12P) terminal No. 8 and amplifier unit 26P connector terminal No. 5.

NAVIGATION UNIT CONNECTOR A (12P)



Wire side of female terminals

Is there continuity?

YES—Go to step 13.

NO—Repair open in the wire between the navigation unit and the amplifier unit.■

13. Substitute a known-good audio unit, and recheck.

Is the system OK?

YES—Replace the audio unit (see page 22-202).■

NO—Go to step 14.

14. Substitute a known-good amplifier unit, and recheck.

Is the system OK?

YES—Replace the amplifier unit (see page 22-203).■

NO—Replace the navigation unit (see page 22-433).■

(cont'd)

Protected by AR

Symptom Troubleshooting (cont'd)

Vehicle position does not move on the map

Before testing, inspect the No. 6 (15A) fuse in the driver's under-dash fuse/relay box.

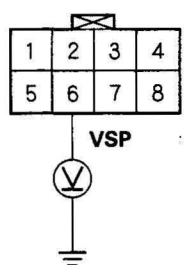
1. Start the engine.
2. Perform the Car Status Test in the Picture Diagnosis Test menu (see page 22-426).

   Is there a vehicle speed pulse signal?

   YES—Replace the navigation unit (see page 22-433).■

   NO—'99 model: go to step 3.
   '00-03 models: refer to the VSS signal Troubleshooting (see page 22-129).
3. Turn the ignition switch OFF.
4. Raise the front of the vehicle, and make sure it is securely supported.
5. Disconnect the navigation unit connector C (8P).
6. Check for a loose No. 6 terminal at the navigation unit connector C (8P).
7. Reconnect the navigation unit connector C (8P).
8. Put the vehicle in neutral with the ignition switch ON (II).
9. Measure the voltage between body ground and navigation unit connector C (8P) terminal No. 6.

NAVIGATION UNIT CONNECTOR C (8P)



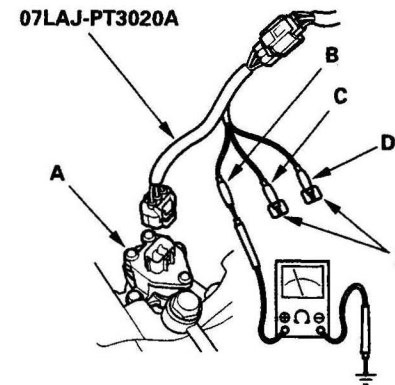
Wire side of female terminals

10. Slowly rotate one wheel with the other wheel blocked.

    Does voltage pulse from 0 to about. 5 V or more?

    YES—Replace the navigation unit (see page 22-433).■

    NO—Go to step 11.
11. Turn the ignition switch OFF.
12. Disconnect the 3P connector from the vehicle speed pulse (VSP) sensor (A).



13. Connect the test harness only to the engine wire harness.
14. Connect the RED test harness clip (B) to the positive prove of an ohmmeter. Cover the white (C) and green (D) test harness with protective tape (E).
15. Check for continuity between the RED test harness clip and body ground.

    Is there continuity?

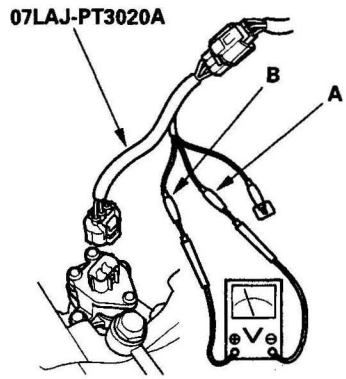
    YES—Go to step 16.

    NO—Repair open in the BLK wire between the VSP and G101.■

BACK

Protected by AR

16. Connect the WHT test harness clip (A) to the positive probe of a voltmeter, and connect the RED test harness clip (B) to the negative probe.



17. Turn the ignition switch ON (II).

Is there battery voltage?

YES – Go to step 18.

NO – Repair open in the BLK/YEL wire between the VSP and the driver's under-dash fuse/relay box. ■

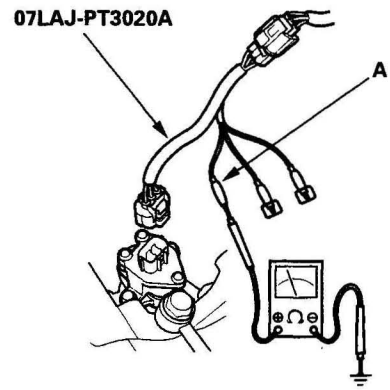
18. Turn the ignition switch OFF.

19. Disconnect the navigation unit connector C (8P) from the navigation unit.

20. Disconnect the WHT and RED test harness clips.

21. Connect the GRN test harness clip (A) to the positive probe of the ohmmeter.

22. Check for continuity between the GRN test harness clip and body ground.



Is there continuity?

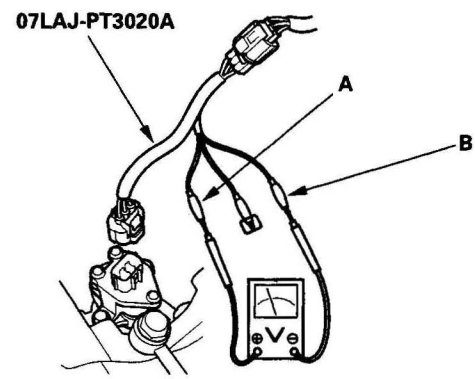
YES – Repair short in the BLU/WHT wire between the VSP and the PCM, cruise control unit, navigation unit, or driver's multiplex control unit. ■

NO – Go to step 23.

23. Reconnect the navigation unit connector C (8P).

24. Turn the ignition switch ON (II).

25. Connect the GRN test harness clip (A) to the positive probe of a voltmeter, and connect the RED test harness clip (B) to negative probe.



Is there 5 V or more?

YES – Replace the VSP (see page 22-433). ■

NO – Repair open in the BLU/WHT wire between the VSP and the navigation unit. ■

Protected by AR

System Diagnosis Test

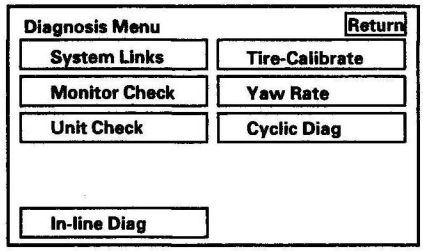
Start-up procedure

1. Turn the ignition switch ON (II), then press and hold the keys in this order: (1) MENU Key. (2) MAP/ GUIDE Key, (3) CANCEL Key, and keep them pressed simultaneously for 5 seconds.

2. After the display changes to the diagnosis menu screen, touch the item you want to check, and the check will start. To return to the previous screen, touch the "RETURN" switch on the diagnosis screen.

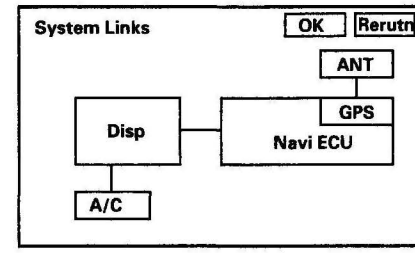
   - System Links.
   - Tire Calibrate.
   - Monitor Check.
   - Yaw Rate.
   - Unit Check.
   - Cyclic Diag.
   - In-line Diag.

DIAGNOSIS MENU SCREEN



System Links

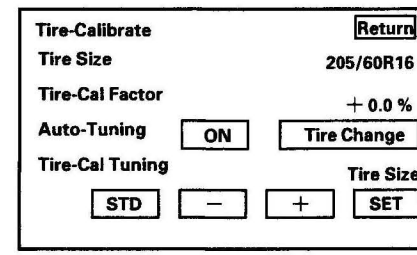
- During diagnosis, all of the communication lines connecting the components are shown in yellow.
- If the system is OK, all of the communication lines connecting the components will change to green, the screen will indicate "OK", and a tone will sound.
- If there is a problem in the system, the faulty communication line will change to red, the screen will indicate "NG", and a tone will sound.
- The indication on the screen will not change until the ignition switch is cycled. After repairing the system, turn the ignition switch OFF to reset the system, then return to the Diagnosis Menu screen, and run system Links again.



Tire Calibrate

'99 Model:

- The "AUTO TUNING" is factory-set to "ON", and it should remain on. If you find it has been turned OFF, turn it back ON.
- The "TIRE-CAL TUNING" can be used, but it is not recommended. The AUTO TUNING fundtion keeps the system in better tune.
- When you touch "TIRE CHANGE" the display will change to the TIRE SIZE screen. This screen is rarely used because only the standard tire size is list[illegible].

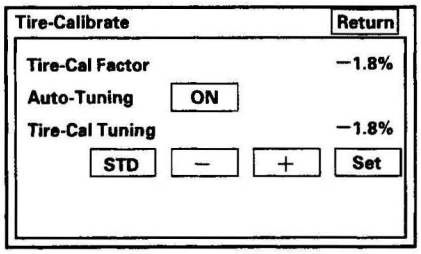


BACK

Protected by AR

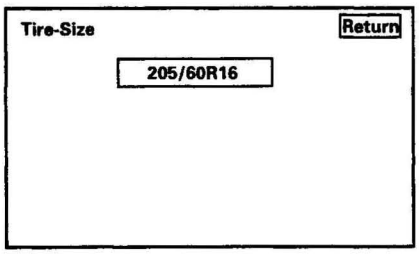
Tire Calibrate

'00-03 Models:
- The "AUTO TUNING" is factory-set to "ON", and it should remain on. If you find it has been turned OFF, turn it back ON.
- The "TIRE-CAL TUNING" can be used, but it is not recommended. The AUTO TUNING fundtion keeps the system in better tune.



Tire Size ('99 Model)

If the tire-cal factor has been reset, touching the tire size will return the tuning value to the standard value.



Yaw Rate

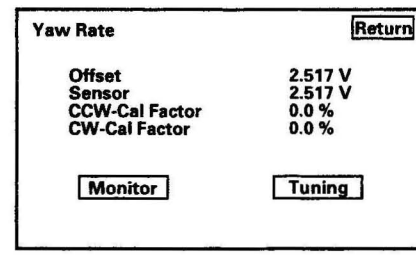
"Offset" is reference voltage or standard within the yaw rate sensor. It should indicate 1.500 to 3.500V with the vehicle stopped.
"Sensor" indicator the voltage output from the yaw rate sensor. It should indicate 1.500 to 3.500 V with the vehicle stopped.
A "Sensor" output voltage HIGHER than that of the "Offset" voltage indicates the vehicle is turning to the RIGHT.
A "Sensor" output voltage LOWER than that of the "Offset" voltage indicates the vehicle is turning to the LEFT.
With the vehicle stopped, sitting still with the engine idling, both the "Offset" and "Sensor" voltages should be within 0.01 V± of each other.
If not replace the Navigation unit.

Example:

Note: The vehicle is stopped, sitting still, with the engine idling.

Good	Offset	2.517 V
	Sensor	2.517 V (0.010 V±)
Bad	Offset	2.517 V
	Sensor	2.823 V

NOTE: Do not try to tune the yaw rate sensor unless instructed by American Honda.



Cyclic Diag

This test, checks the following items repeatedly:

- Navigation unit check
- Monitor check (except switch test)

To exit this test, press the CANCEL key

(cont'd)

Protected by AR

System Diagnosis Test (cont'd)

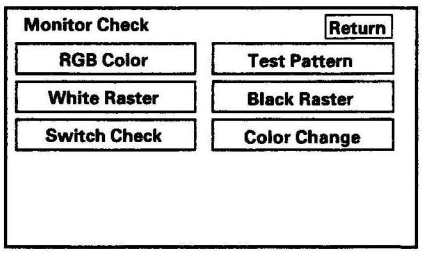
In—Line Diag

This test checks the following item:

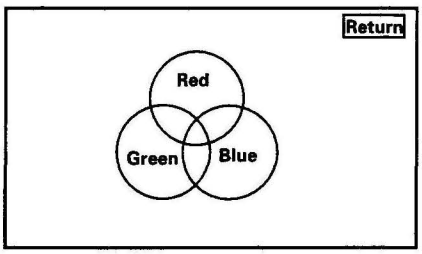
- System links
- Car status
- Yaw rate

Monitor Check

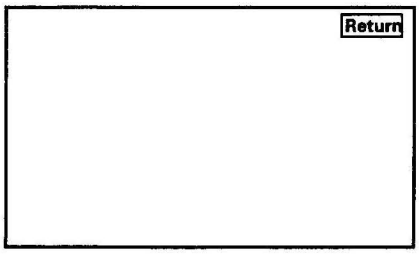
Touch the item you want to check, and the check starts.
*: This screen shows '00-03 models.



RGB COLOR
The three primary colors of red, green and blue must be shown. If any color(s) are missing, troubleshoot for the missing color (see page 22-412).

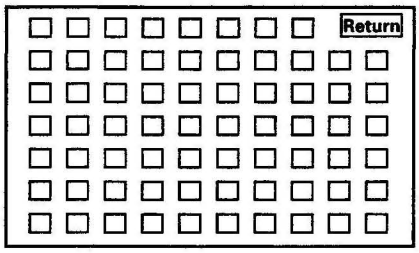


WHITE RASTER
The entire display must be shown in white.



Switch Check
Each switch must be shown on the display and each switch must reverse and sound, when touched.

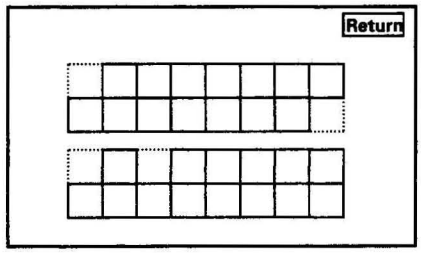
NOTE: The test may be affected if done in direct sunlight.



BACK

Protected by AR

TEST PATTERN
All 32 colors including black must be indicated (including the back ground color).

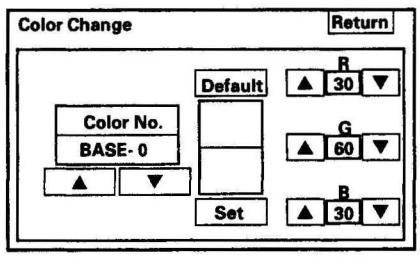


BLACK RASTER
The entire display must be shown in black.



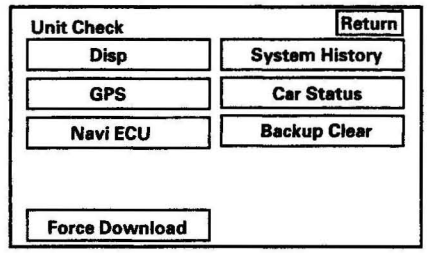
Color Change ('00-03 Models)

This screen is for manufacturer's use only.



Unit Check

Touch the item you want to check, and the check starts.
* : This screen shows '00-03 models.

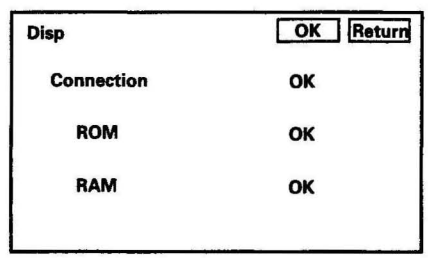


NOTE: Do not use " Force Download", this command is for the manufacturer's use only.

Disp

When the connection is NG.
First check for loose terminals at the navigation unit and the display unit connectors.
Next check for an open or short in the communication line between the navigation unit and the display unit. If the line is OK, replace the display unit. If the line is found to have an open or short, replace the affected shielded harness.

When the ROM or RAM is NG.
Replace the display unit.



(cont'd)

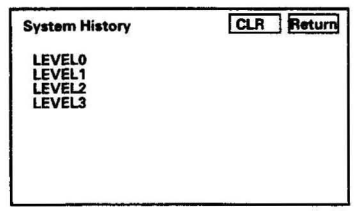
Protected by AR

System Diagnosis Test (cont'd)

System History

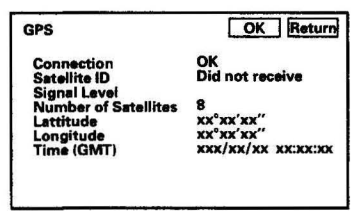
This screen is for the manufacturer's use only.

NOTE: Do not touch the CLR switch. Touching the CLR switch will clear the system history, making it difficult for factory diagnosis if the navigation unit is replaced.

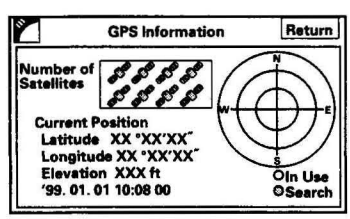


GPS

'99 Model:
When the connection is NG, check the GPS antenna connection. If the connection is OK, replace the GPS antenna.



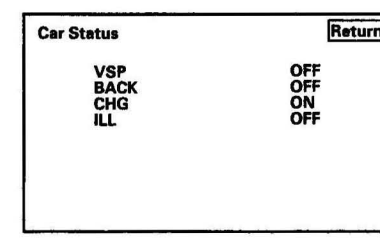
'00-03 Models:
This screen shows the condition of the GPS reception and the vehicle position.
The vehicle should be parked outside away from buildings, tall trees, and high tension lines for 10 minutes with the motor running.
The number of satellites box should contain at least three yellow satellite icons. If not, troubleshoot for satellite icon not indicated.



Car Status

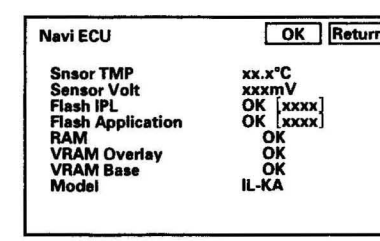
Use the car status screen to check each signal.
If the indication does not match the actual vehicle status, check the applicable signal line.

- VSP (vehicle speed pulse indication)
  - OFF when vehicle is not moving
  - ON when vehicle is moving
- BACK (reverse indication)
  - OFF when shift lever is in any position other than reverse
  - ON when shift lever is in reverse
- CHG (charging indication)
  - ON when engine is running and alternator is charging
  - OFF when engine is off or alternator is not charging
- ILL (illumination indication)
  - OFF when parking lights or headlights are off
  - ON when parking lights or headlights are on



Navi ECU

'99 Model:
When any item is NG, replace the navigation unit.



BACK

Protected by AR

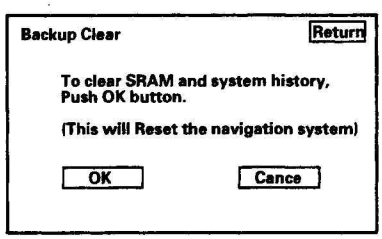
Navi ECU

'00-03 Models:
When any item is NG, replace the navigation unit.

Navi ECU	OK	Return
High Tmp	XX °°C	
Low Tmp	XX °°C	
Flash IPL	OK [XXXX]	
Flash Application	OK [XXXX]	
RAM	OK	
VRAM Overlay	OK	
VRAM Base	OK	
Model	XX	

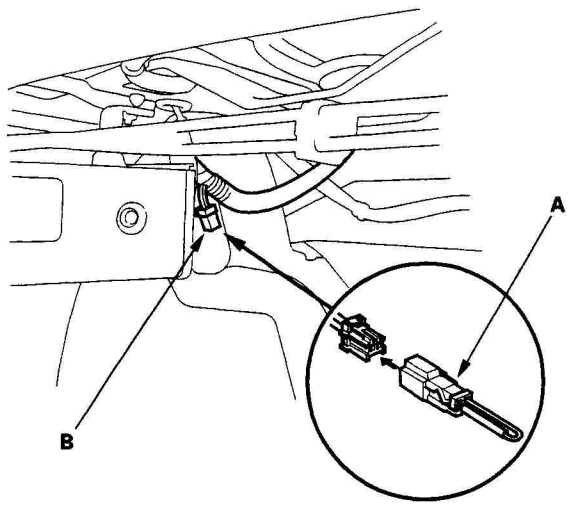
Back-up Clear

This screen is for manufacturer's use only. It clears the error log, making it difficult for the factory to troubleshoot a problem.

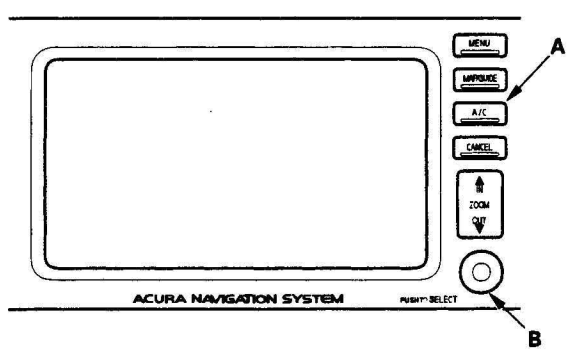


Forced Starting of Display

1. Pull back the front corner of left trunk side trim.
2. Connect the SCS service connector (A) to the navigation service check conector (B).



3. Check that the diagnosis menu for the picture diagnosis start up and then changes to the system link screen.
4. If the display does not turn on, turn the ignition switch off, press and hold the A/C key (A), press and hold joystick (B) up, then the ignition switch to ACC (I). If the display fails to light or the system link screen is not displayed, refer to No picture is shown on the display (see page 22-412).

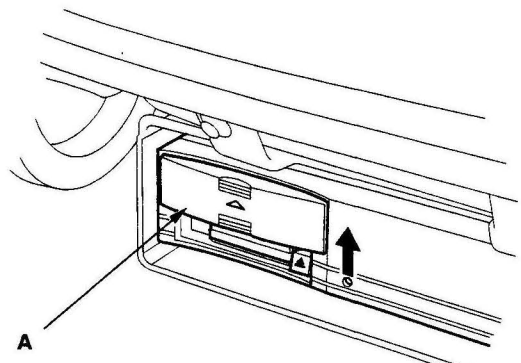


Protected by AR

Hard Disk Replacement

'99 Model:

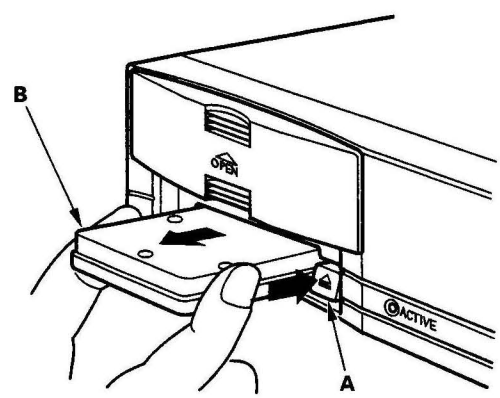
1. Turn the ignition switch OFF.
2. Slide the front cover (A) of navigation unit up.



3. Press the EJECT (A) switch.

   NOTE: Make sure the ignition switch is OFF.

4. Remove the hard disk(B).



5. Insert the new hard disk.
6. Slide the front cover down.

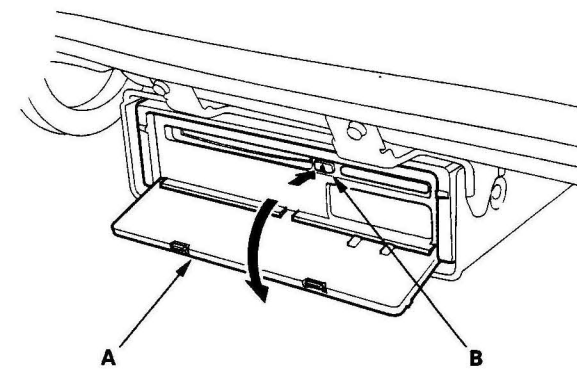
   NOTE: After servicing, the front cover must be down. If you start up the navigation system with the front cover up, the display will indicate "NO Hard Disk".

DVD-ROM Replacement

'00-03 Models:

NOTE: When the DVD-ROM is reinserted or replaced, a map-match must be done (see page 22-391).

1. Turn the ignition switch ON (II).
2. Open the front cover (A) of navigation unit.
3. Press the EJECT (B) switch.



4. Remove the DVD-ROM.
5. Insert the new DVD-ROM.
6. Close the front cover.
   Do not turn the ignition switch OFF until data is downloaded to the navigation unit.

   NOTE: After servicing, the front cover must be closed. If you start up the navigation system with the front cover open, the display will indicate "Navigation unit door is open or No DVD Disk installed. Please check system".

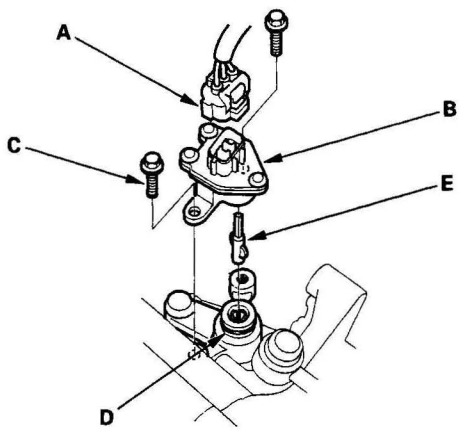
BACK

Protected by AR

Vehicle Speed Pulse (VSP) Sensor Replacement

'99 Model:

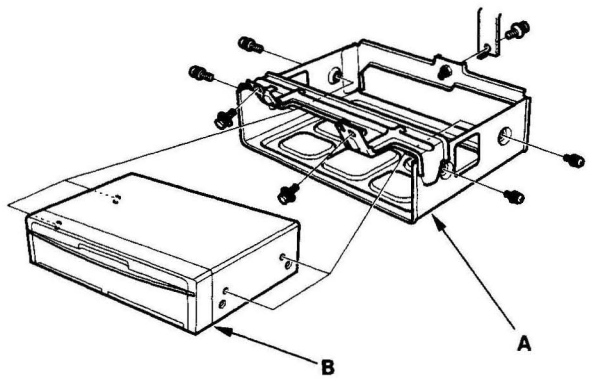
1. Disconnect the 3P connector (A) from the vehicle speed pulse (VSP) sensor (B).
2. Remove the mounting bolt (C), then remove the VSP.



3. Install the VSP. Lubricate the new O-ring (D) and the vehicle speed pulse (VSP) sensor joint (E) with grease before installing.

Navigation Unit Removal/Installation

1. Remove the navigation unit bracket (A) from the trunk.



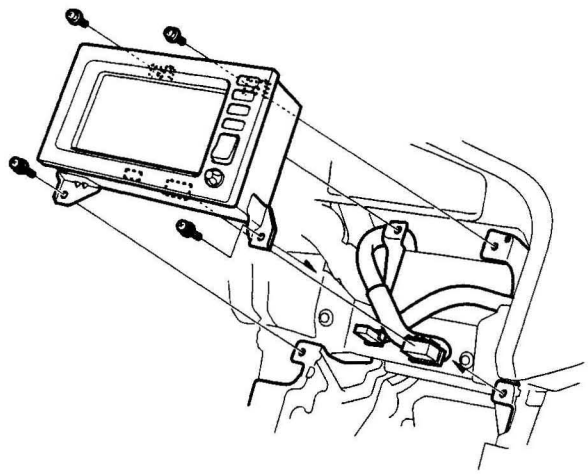
The illustration shows '00 model.

2. Remove the navigation unit (B) from the bracket.
3. Install the parts in the reverse order of removal.

Protected by AR

Display Unit Removal/Installation

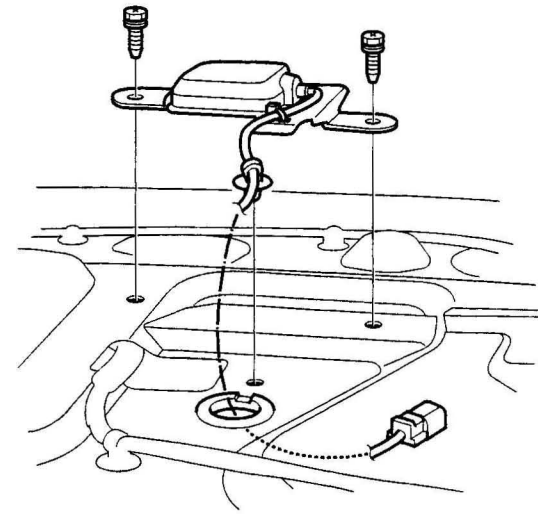
1. Remove the instrument panel (see page 20-65).
2. Remove rear console (see page 20-62), and the console panel (see page 20-63).
3. Remove the audio unit (see page 22-200).
4. Remove the display unit.



5. Install the parts in the reverse order of removal.

GPS Antenna Removal/Installation

1. Remove the rear speaker grille and left rear shelf (see page 20-56).
2. Remove the GPS antenna from the rear shelf area.



3. Install the parts in the reverse order of removal.

BACK

Protected by AR

Clock Display Size and Location Adjustment

'00-03 Models

1. Turn the ignition switch ON (II).
2. When the disclaimer is shown on the navigation display unit, touch "OK".
3. When the "Enter destination by:" screen is shown, touch "Setup."
4. When the "Setup Screen" is shown, touch Display "Off."
5. Touch the numbers of the clock to change the clock size and location.
   - If the clock is small and in the lower right hand corner of the screen, it will increase in size and move to the center of the screen.
   - If the clock is large and in the center of the screen, it will decrease in size and move to the lower right hand corner of the screen.
6. Push the MENU button to return to the "Enter destination by:" screen. The clock display settings will be saved.

Protected by AR

Restraints

Restraints
Special Tools 23-2

Seat Belts
Component Location Index 23-3
Front Seat Belt Replacement 23-4
Rear Seat Belt Replacement 23-7
Inspection 23-10
Child Seat Tether Anchor Plate Installationl 23-11
Child Seat Tether Anchor Plate
Removal/Installation 23-12

SRS (Supplemental Restraint System)
Component Location Index 23-14
Precautions and Procedures 23-17
General Troubleshooting Information 23-28
DTC Troubleshooting Index 23-34
Symptom Troubleshooting Index 23-39
System Description 23-41
Circuit Diagram 23-47
DTC Troubleshooting 23-52
SRS Indicator Circuit Troubleshooting 23-188
Component Replacement/Inspection
After Deployment 23-218
Driver's Airbag Replacement 23-219
Front Passenger's Airbag Replacement 23-221
Side Airbag Replacement 23-223
Airbag Disposal 23-224
Cable Reel Replacement 23-231
SRS Unit Replacement 23-237
Side Impact Sensor Replacement 23-239
OPDS Unit Replacement 23-240



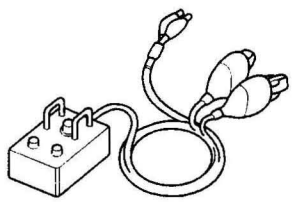
Protected by AR

Special Tools

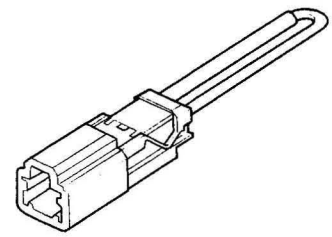
Ref.No.	Tool Number	Description	Qty
①*1	07HAZ-SG00500	Deployment Tool	1
②	07PAZ-0010100	SCS Service Connector	1
③	07SAZ-TB4011A	SRS Inflator Simulator	1
④	07TAZ-SZ5011A	SRS Simulator Lead C	1
⑤*2	07TAZ-001020A	Backprobe Adapter, 17 mm	2
⑥	07XAZ-S1A0200	SRS Simulator Lead E	1
⑦	07XAZ-SZ30100	SRS Simulator Lead F	1

*1: Included in SRS Tool Set 07MAZ-SM5000B

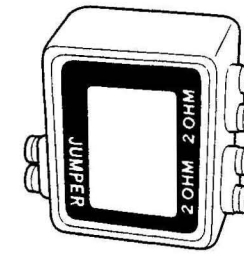
*2: Use with the stacking patch cords from T/N 07SAZ-001000A, Backprobe Set.



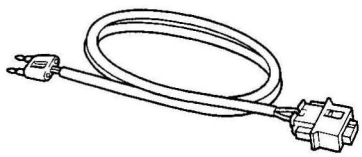
①



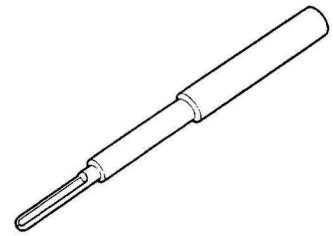
②



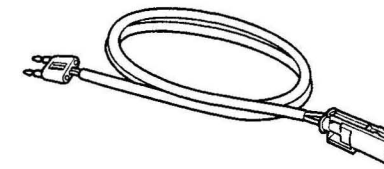
③



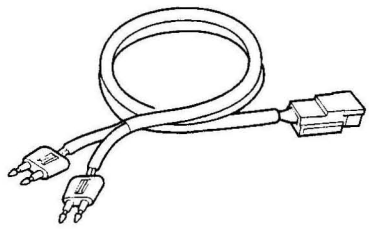
④



⑤



⑥

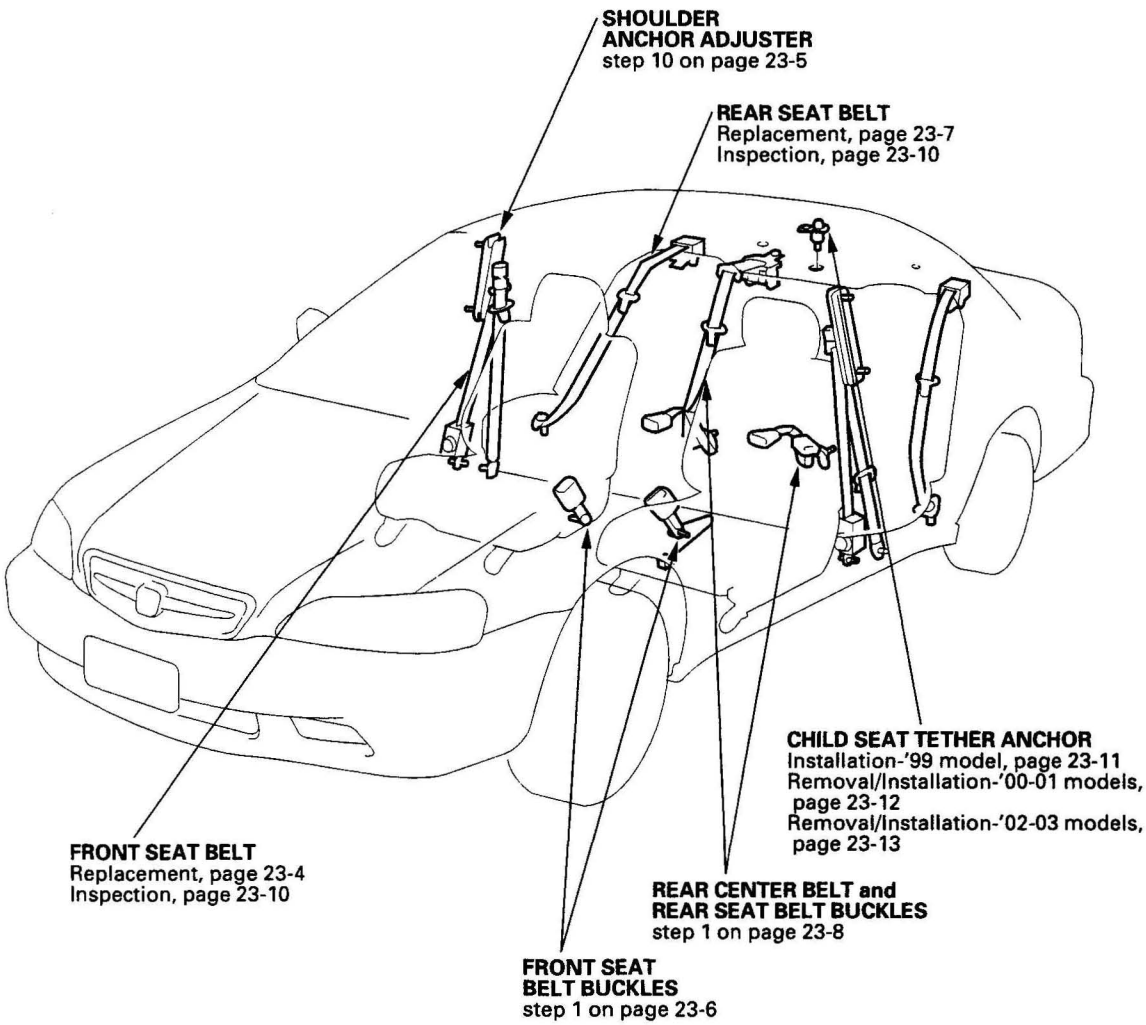


⑦

BACK

Protected by AR

Component Location Index



Protected by AR

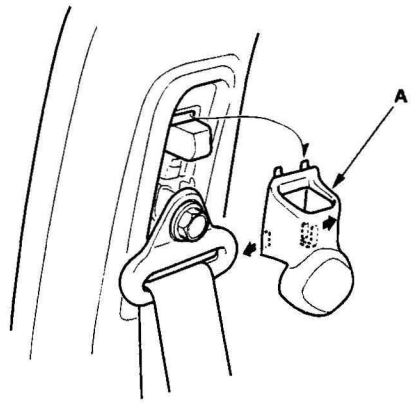
Front Seat Belt Replacement

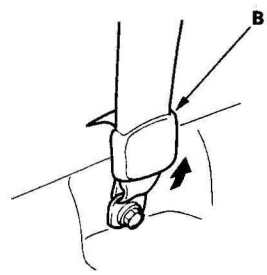
SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-17) in the SRS section before performing repairs or service.

NOTE: Check the front seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

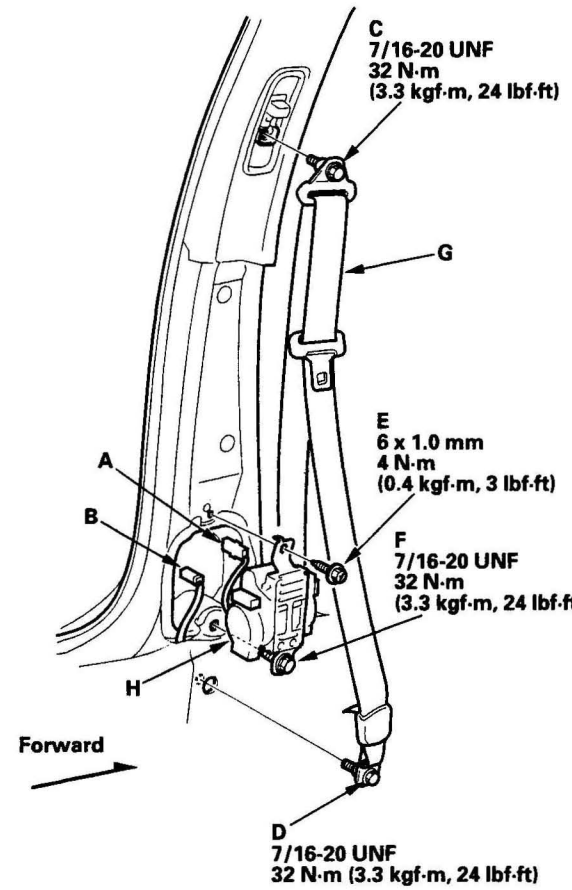
Front Seat Belt

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the preset buttons.
2. Disconnect the negative battery cable, and wait at least 3 minutes before beginning work.
3. Slide the front seat all the way forward.
4. Remove these items:
   - Rear seat cushion (see page 20-95).
   - Center pillar lower trim panel (see page 20-55).
5. Remove the upper anchor cover (A), and pull the lower anchor cover (B) back.





6. '02-03 models: Disconnect the seat belt tensioner connector (A) and seat belt tension reducer connector (B).



7. Remove the upper anchor bolt (C) and lower anchor bolt (D), the retractor mounting self-tapping ET screw (E), the retractor bolt (F), and remove the front seat belt (G) and retractor (H).

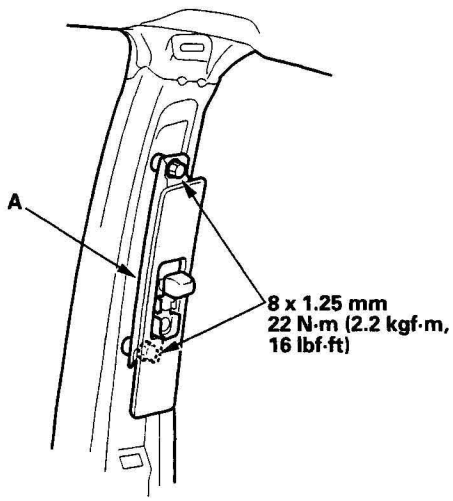
BACK

Protected by AR

8. Remove the front and rear door trim as necessary, (see page 20-55).

9. Remove the center pillar upper trim, (see page 20-55).

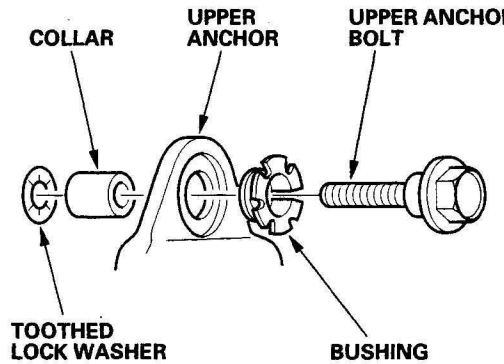
10. Remove the shoulder anchor adjuster (A).



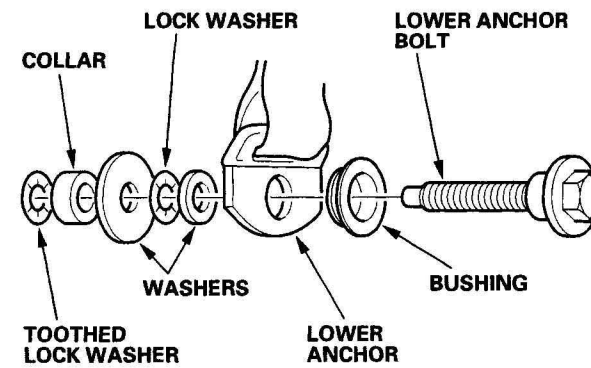
11. Install the belt in the reverse order of removal, and note these items:

- Apply liquid thread lock to the upper anchor bolt before reinstallation.
- Check that the retractor locking mechanism functions (see page 23-10).
- Assemble the washers, collar, and bushing on the upper and lower anchor bolts as shown.
- Before installing the anchor bolts, make sure there are no twists or kinks in the front seat belt.
- Make sure the seat belt tensioner connector and seat belt tension reducer connector are plugged in properly.
- Reconnect the negative cable to the battery.
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.

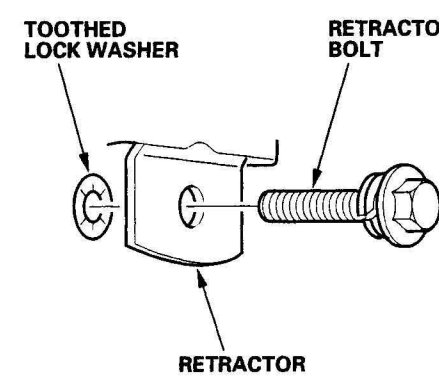
Upper anchor bolt construction:



Lower anchor bolt construction:



Retractor bolt construction:



(cont'd)

BACK

Protected by AR

Front Seat Belt Replacement (cont'd)

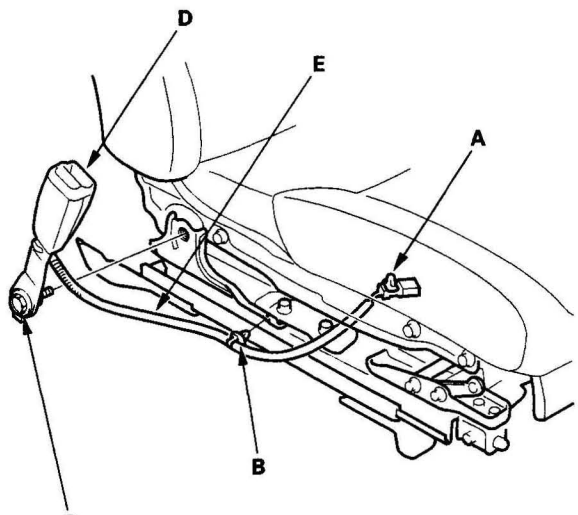
Seat Belt Buckle

1. Remove the front seat (see page 20-78).

2. Remove the center cover, 4-way power seat on '99 model (see page 20-80), 4-way power seat on '00-03 models (see page 23-81), 8-way power seat on '99-01 models (see page 20-82), 8-way power seat on '02-03 models (see page 20-83),

3. On the driver's seat and '00-03 models passenger's seat, disconnect and detach the seat belt switch connector clip (A) and harness clip (B).

   • Driver's seat is shown, and '00-03 model passenger's seat is similar.



C
7/16-20 UNF
32 N·m (3.3 kgf·m, 24 lbf·ft)

4. Remove the center anchor bolt (C), and remove the seat belt buckle (D).

5. If equipped, remove the seat belt switch harness (E).

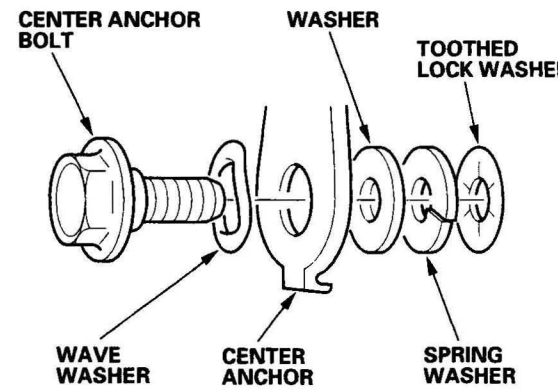
   –1 On the driver's seat, adjust the seat cushion to its maximum height.

   –2 Pull the seat belt switch harness out through the space between the seat cushion and the seat linkage.

6. Install the seat belt buckle in the reverse order of removal, and note these items:

   • Verify wire harness routing; Operate the seat (back and forth, up and down), check that the seat functions do not pull or pinch the seat belt buckle wire harness.
   • Assemble the washers on the center anchor bolt as shown.

Center anchor bolt installation:



BACK

Protected by AR

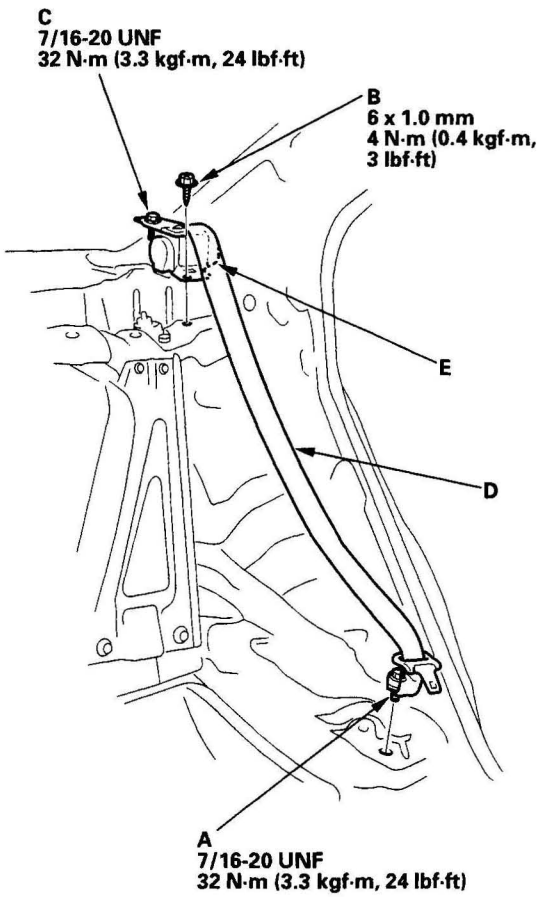
Rear Seat Belt Replacement

NOTE: Check the rear seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

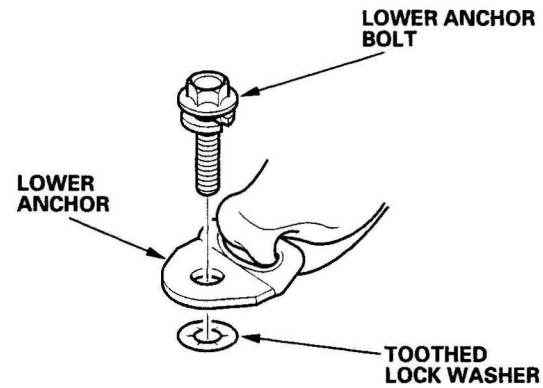
Rear Seat Belt

1. Remove:
   - Rear seat cushion (see page 20-95)
   - Rear seat-back (see page 20-95)
   - Rear shelf, '99-01 models (see page 20-56), '02-03 models (see page 20-57)

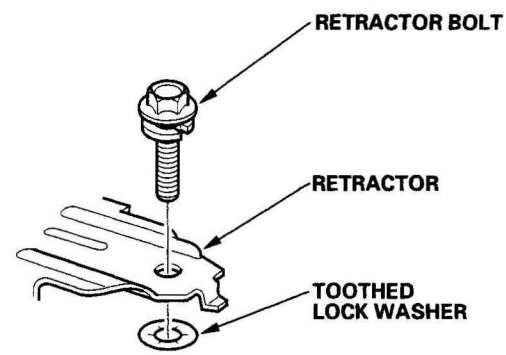
2. Remove the lower anchor bolt (A), the retractor mounting ET screw (B), the retractor bolt (C), and remove the rear seat belt (D) and retractor (E).



Lower anchor bolt construction:



Retractor bolt construction:



3. Install the seat belt and retractor in the reverse order of removal, and note these items:
   - Check that the retractor locking mechanism functions as described (see page 23-10).
   - Before installing the anchor bolt, make sure there are no twists or kinks in the rear seat belt.
   - Apply liquid thread lock to the lower anchor bolt and the retractor bolt before reinstallation.

(cont'd)

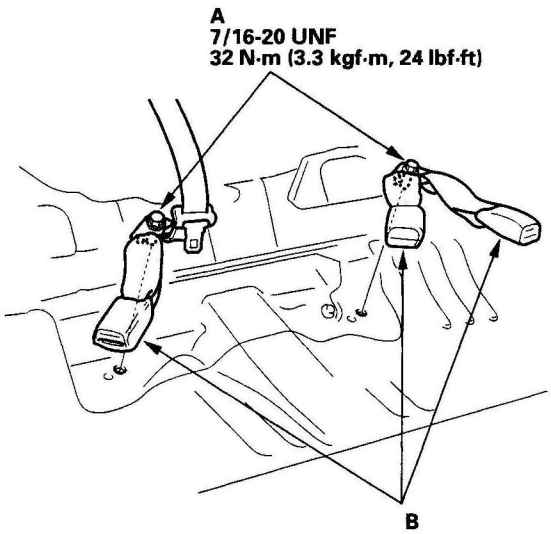
BACK

Protected by AR

Rear Seat Belt Replacement (cont'd)

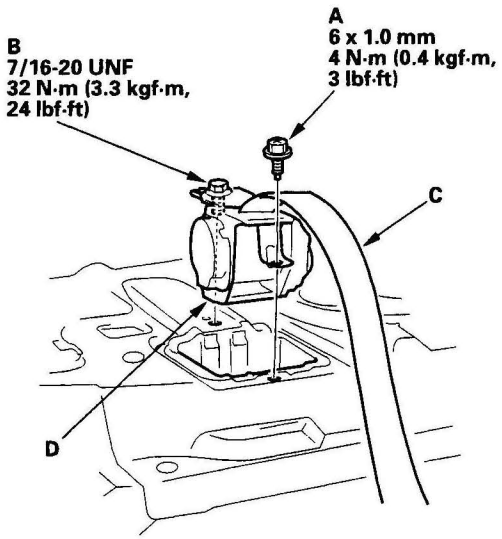
Center Belt and Seat Belt Buckles

1. Remove the rear seat cushion (see page 20-95).
2. Remove the center anchor bolts (A), and remove the seat belt buckles (B).

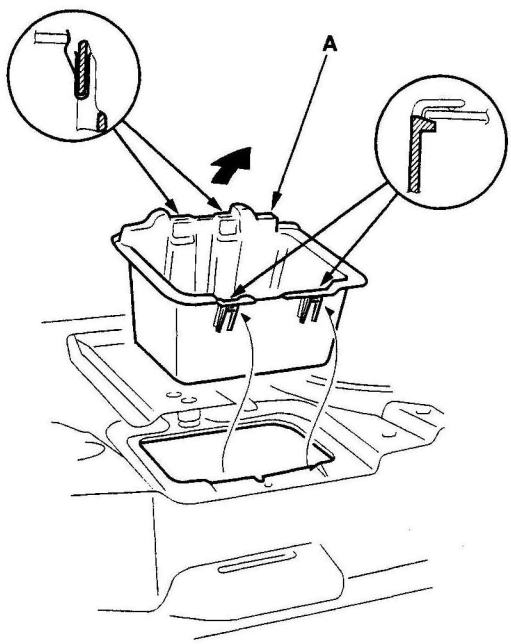


3. Remove these items:
   - Rear seat-back (see page 20-95)
   - Rear shelf, '99-01 models (see page 20-56), '02-03models (see page 20-57)

4. Remove the retractor mounting ET screw (A), and the retractor bolt (B), then remove the center belt (C) and retractor (D).



5. Remove the protector (A).



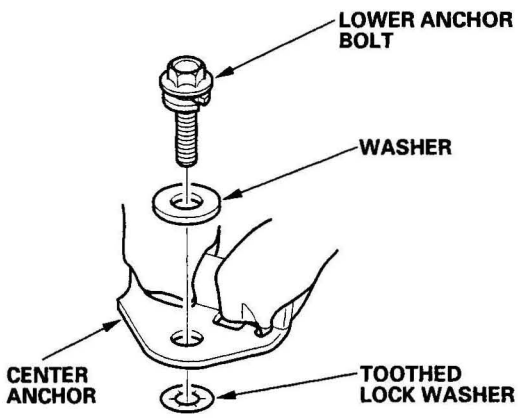
BACK

Protected by AR

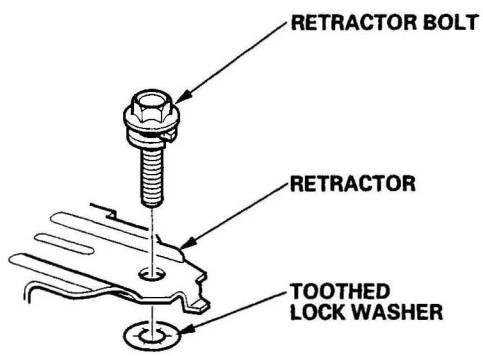
6. Install the center belt and retractor in the reverse order of removal, and note these items:

   - Check that the retractor locking mechanism functions (see page 23-10).
   - Assemble the washers on the center anchor bolt as shown.
   - Before installing the center anchor bolt, make sure there are no twists or kinks in the center belt.

Center anchor bolt construction:



Retractor bolt construction:



Protected by AR

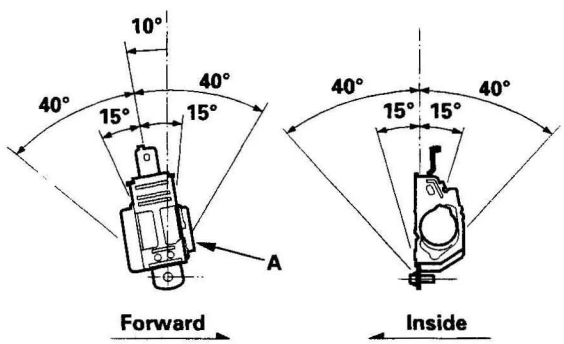
Inspection

'02-03 models: For the front seat belt retractor with seat belt tensioner, review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-17) in the SRS section before performing repairs or service.

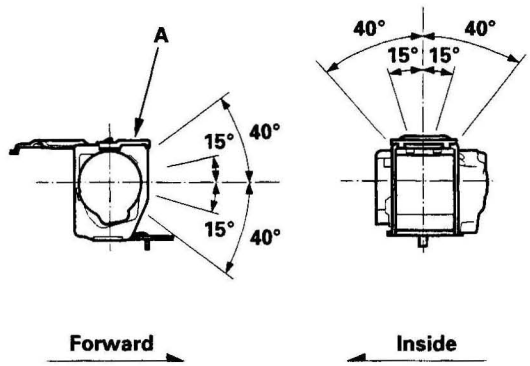
Retractor

1. Before installing the retractor, check that the seat belt can be pulled out freely.
2. Make sure that the seat belt does not lock when the retractor (A) is leaned slowly up to 15° from the mounted position. The seat belt should lock when the retractor is leaned over 40°. Do not attempt to disassemble the retractor.

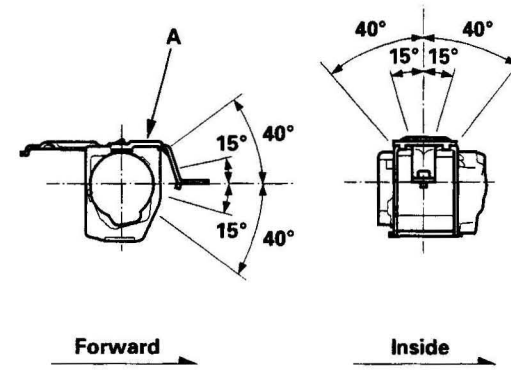
Front:



Rear:



Rear center:



3. Replace the seat belt with a new assembly if there is any abnormality. Do not disassemble any part of the seat belt for any reason.

BACK

Protected by AR

In-vehicle

1. Check that the seat belt is not twisted or caught on anything.

2. After installing the anchors, check for free movement on the anchor bolts. If necessary, remove the anchor bolts and check that the washers and other parts are not damaged or improperly installed.

3. Check the seat belts for damage or discoloration. Clean with a shop towel if necessary. Use only soap and water to clean.

   NOTE: Dirt build-up in the metal loops of the upper anchors can cause the seat belts to retract slowly. Wipe the inside of the loops with a clean cloth dampened in isopropyl alcohol.

4. Check that the seat belt does not lock when pulled out slowly. The seat belt is designed to lock only during a sudden stop or impact.

5. Make sure that the seat belt will retract automatically when released.

6. For each passenger's seat belt, check the seat belt retractor locking mechanism ALR (automatic locking retractor). This function is for securing child seats:

   –1 Pull the seat belt all the way out to engage the ALR. The seat belt should retract with a ratcheting sound, but not extend. This is normal.
   –2 To disengage the ALR, release the seat belt and allow it to fully retract then pull the seat belt out part-way. The seat belt should retract and extend normally.

7. Replace the seat belt with a new assembly if there is any abnormality. Do not disassemble any part of the seat belt for any reason.

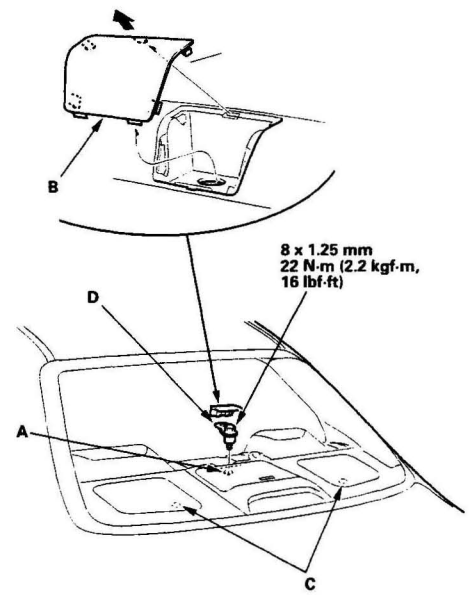
Child Seat Tether Anchor Installation

'99 Model

Attachment points are provided for a rear-seat-mounted child restraint system that uses a top tether. The attachment points are located on the rear speaker grille and on the right and left rear shelves, just behind the rear seat-back. When using a child seat with a top tether, install the child seat tether anchors securely.

NOTE:
- Do not remove the toothed washer from the child seat tether anchor. Use the anchor with the toothed washer attached to it.
- When installing a child seat on the rear seat, follow the instructions of the manufacturer of the child seat.
- Additional anchor plates are available.

1. When using the middle attachment point (A), remove the cover (B) from the rear speaker grille then go to step 4. When using the side attachment points (C) on the rear shelves, go to step 2.



2. From inside the trunk, select one of the two side attachment points (weldnuts) and poke an awl through it to make a marker hole in the rear shelf fabric.

3. From inside the vehicle, use a sharp knife to cut a 22 mm (7/8 in.) diameter hole in the rear shelf fabric and base at the marker hole.

4. Install the child seat tether anchor (D). Torque the bolt to 22 N·m (2.2 kgf·m, 16 lbf·ft).

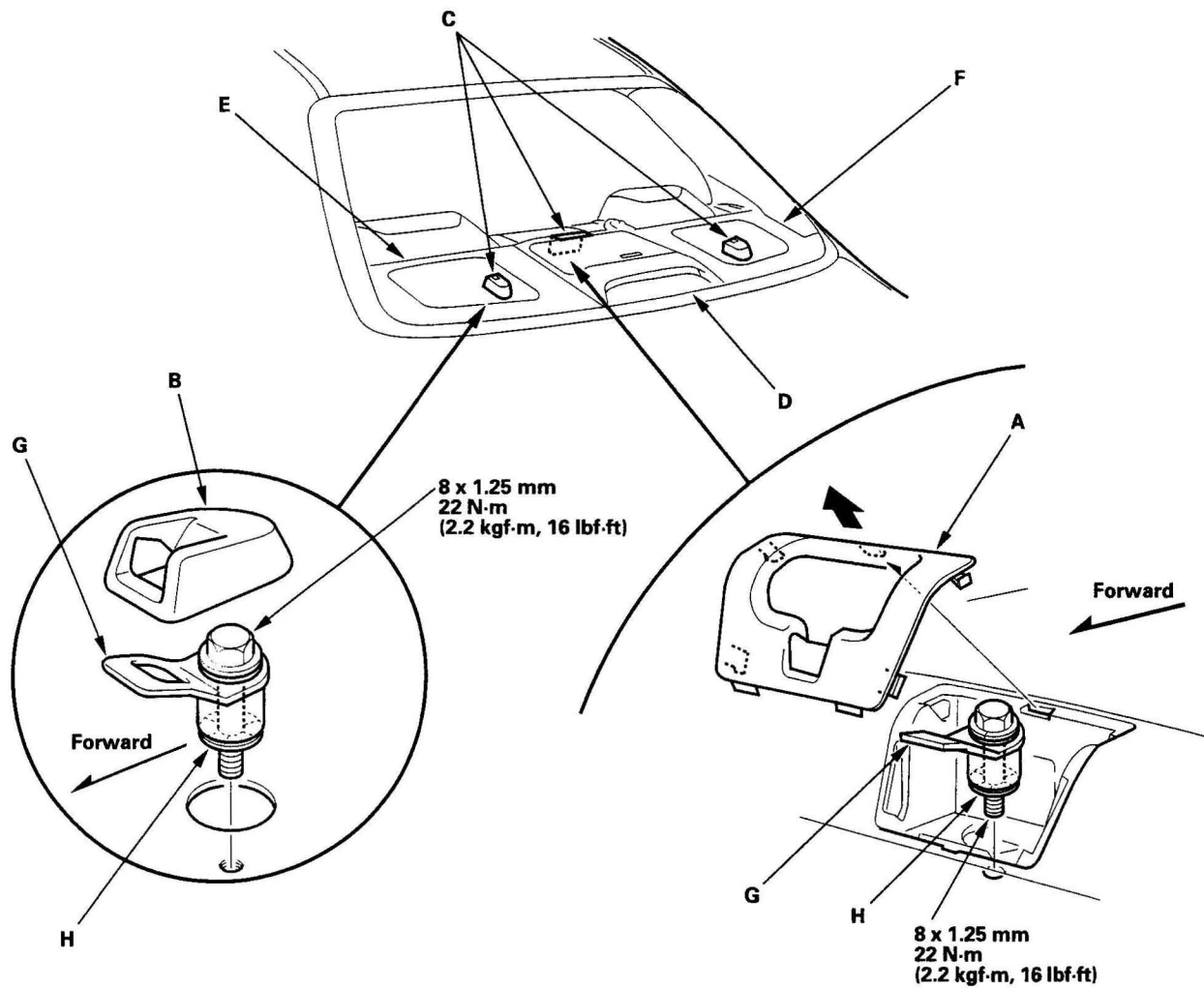
Protected by AR

Child Seat Tether Anchor Removal/Installation

'00-01 Models

1. Remove the middle child seat tether anchor cover (A) and both side child seat tether anchor covers (B) from each attachment point (C) in the rear speaker grille (D), left rear shelf (E), and right rear shelf (F)

Unit: mm (in.)



2. Remove the middle and both side child seat tether anchors (G). Do not remove the toothed washer (H) from the child seat tether anchor.

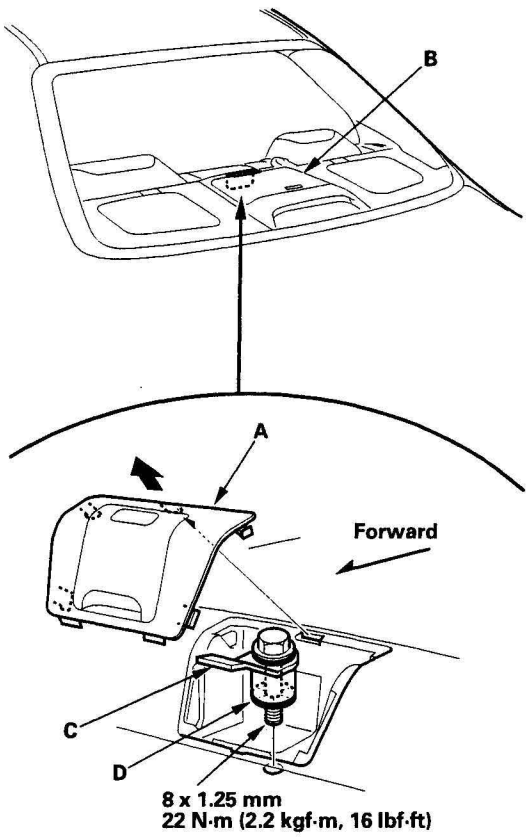
3. Install the tether anchor in the reverse order of removal.

BACK

Protected by AR

Middle Child Seat Tether Anchor on '02-03 models

1. Remove the middle child seat tether anchor cover (A) from the speaker grille housing (B).



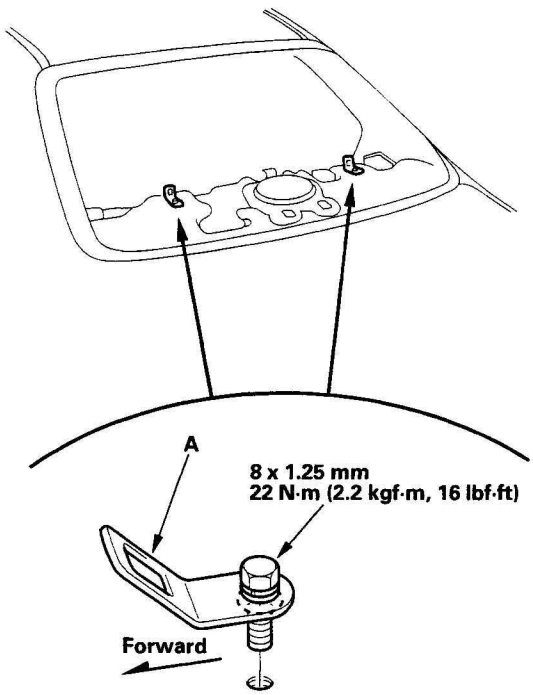
2. Remove the middle child seat tether anchor (C). Do not remove the toothed washer (D) from the child seat tether anchor.

3. Install the tether anchor in the reverse order of removal.

Side Child Seat Tether Anchors on '02-03 models

1. Remove the rear shelves from both sides (see page 20-57).

2. Remove both side child seat tether anchors (A).



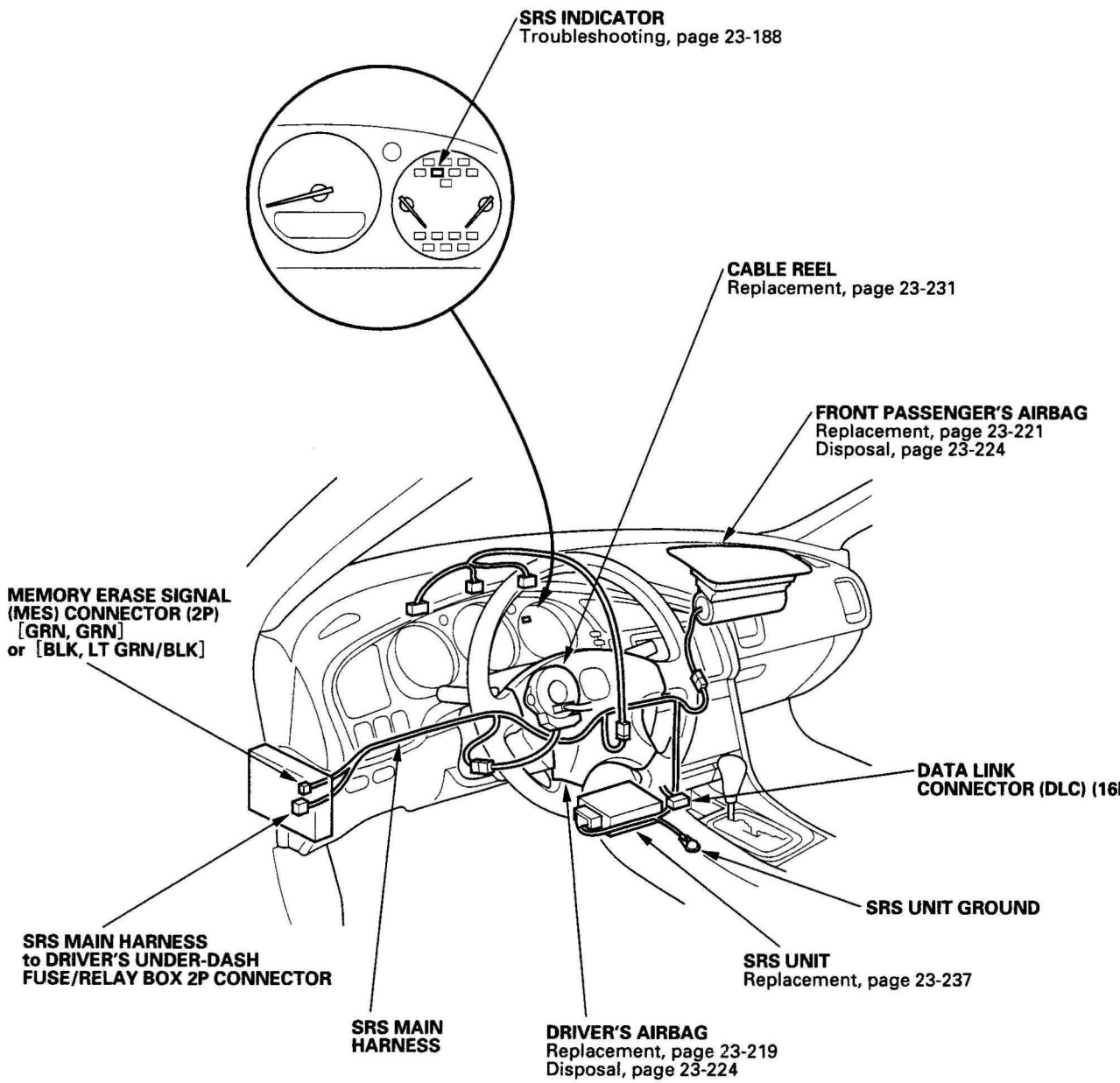
3. Install the tether anchors in the reverse order of removal.

BACK

Protected by AR

Component Location Index

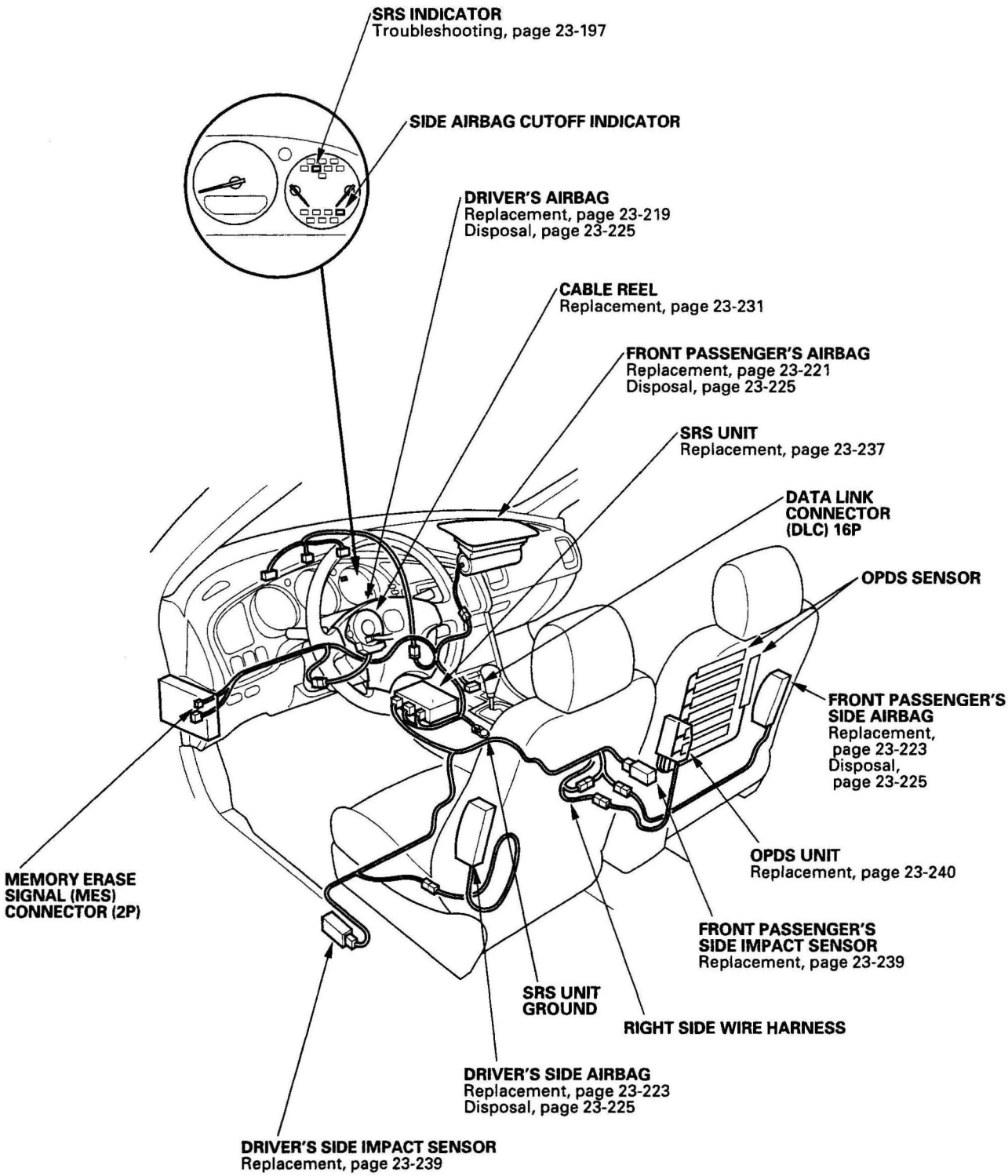
'99 Model



BACK

Protected by AR

'00-01 Models

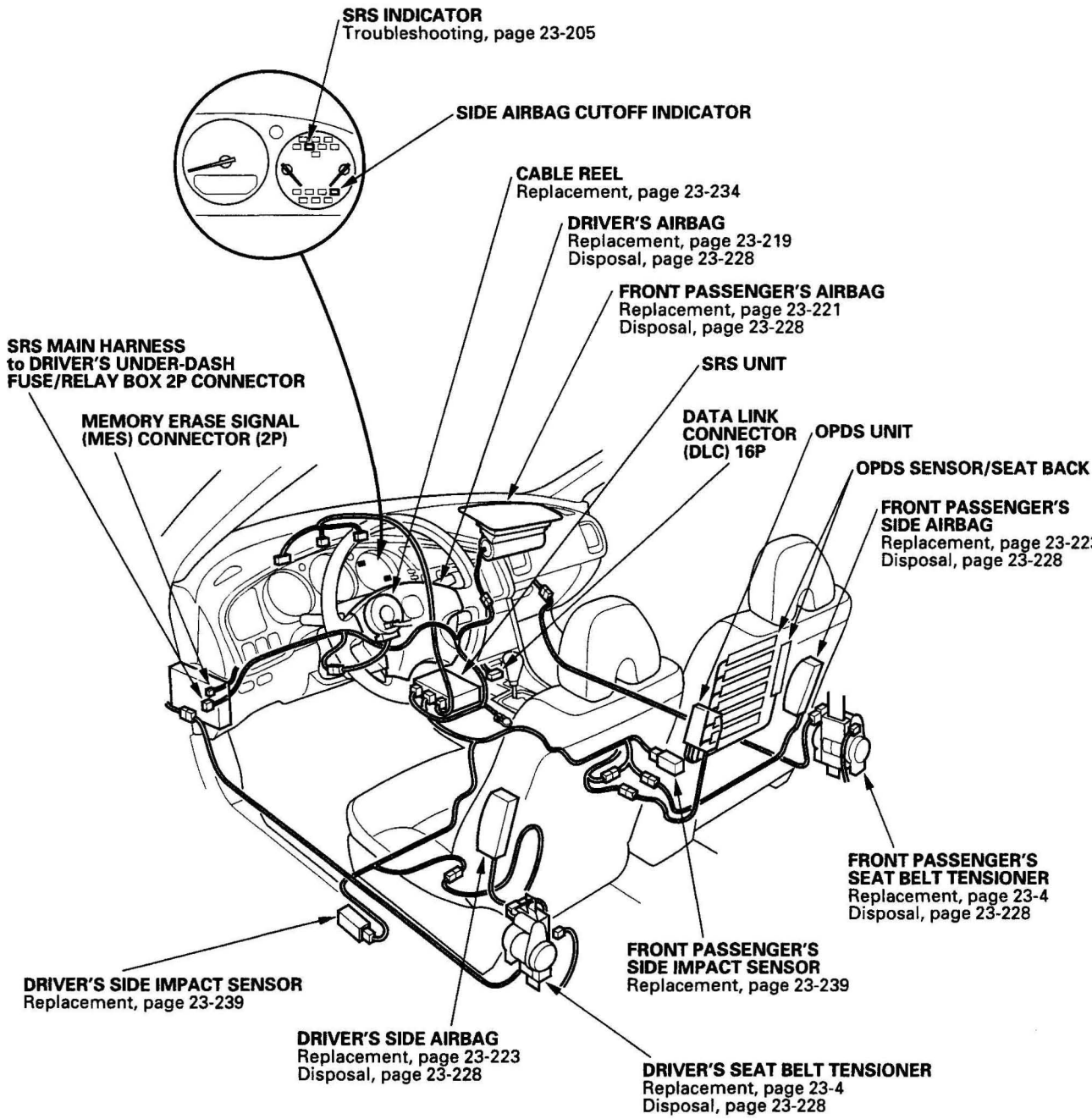


BACK

Protected by AR

Component Location Index (cont'd)

'02-03 Models



BACK

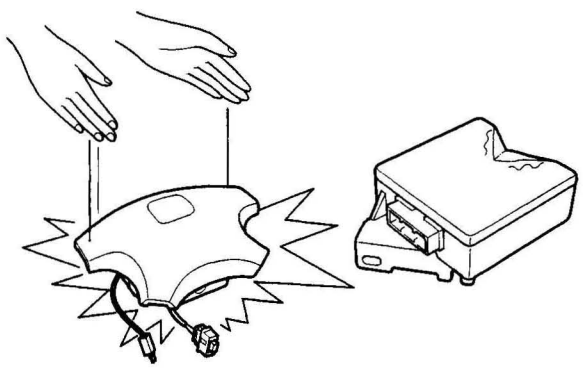
Protected by AR

Precautions and Procedures

General Precautions

Please read the following precautions carefully before performing the airbag system service. Observe the instructions described in this manual, or the airbags could accidentally deploy and cause damage or injuries.

- Except when performing electrical inspections, always turn the ignition switch OFF, disconnect the negative cable from the battery, and wait at least three minutes before beginning work.
  NOTE: The contents in the memory is not erased even if the ignition switch is turned OFF or the battery cables are disconnected from the battery.
- Use the replacement parts which are manufactured to the same standards as the original parts and quality. Do not install used SRS parts. Use only new parts when making SRS repairs.
- Carefully inspect any SRS part before you install it. Do not install any part that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.



- Before removing any of the SRS parts (including disconnection of connectors), always disconnect the SRS connector.
- Use only a digital multimeter to check the system. If it is not a Honda multimeter, make sure its output is 10 mA (0.01 A) or less when switched to the lowest value in the ohmmeter range. A tester with a higher output could cause accidental deployment and possible injury.
- Do not put objects on the front passenger's airbag.
- The original radio and navigation system have coded theft protection circuits. Be sure to get the customer's radio and navigation system codes and write down the frequencies for the radio's preset stations before disconnecting the battery cable.
- Before returning the vehicle to the customer, enter the navigation code, enter the radio code, then enter the customer's radio station presets, and set the clock.

Steering-related Precautions

Cable Reel Alignment

- Misalignment of the cable reel could cause an open in the wiring making the SRS system and the horns inoperative. Center the cable reel whenever the following is performed (see step 6 on page 23-233).

  – Installation of the steering wheel
  – Installation of the cable reel
  – Installation of the steering column
  – Other steering-related adjustment or installation

- Do not disassemble the cable reel.

- Do not apply grease on the cable reel.

- If the cable reel shows any signs of damage, replace it with a new one. For example, it does not rotate smoothly.

(cont'd)

BACK

Protected by AR

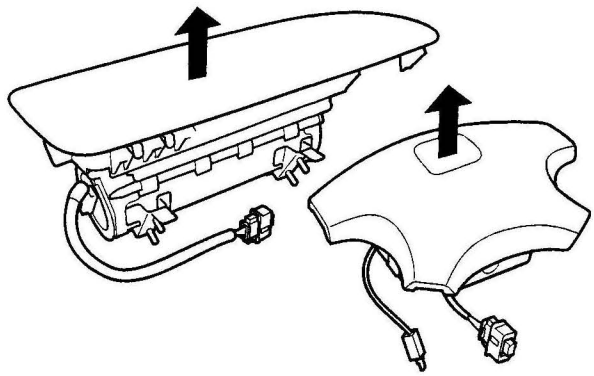
Precautions and Procedures (cont'd)

Airbag Handling and Storage

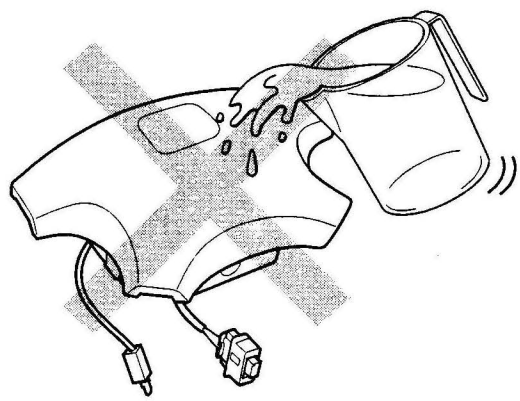
Do not disassemble the airbags. It has no serviceable parts. Once an airbag has been deployed, it cannot be repaired or reused.

For temporary storage of the airbag during service, please observe the following precautions.

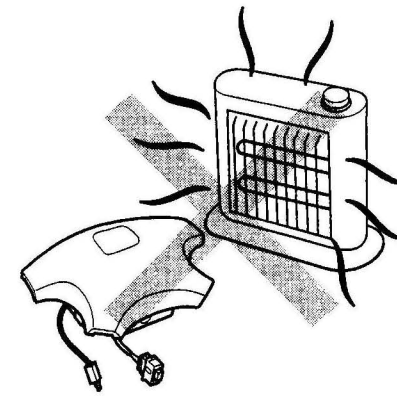
- Store the removed airbag with the pad surface up. Never put any things on the removed airbag.



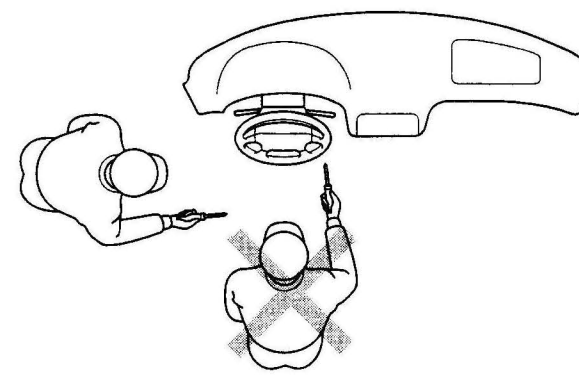
- To prevent damage to the airbag, keep it free from any oil, grease, detergent, or water.



- Store the removed airbag on a secure, flat surface away from any high heat source (exceeding 200° F/ 93° C).



- Never perform electrical inspections to the airbags, such as measuring resistance.
- Do not position yourself in front of the airbag during removal, inspection, or replacement.



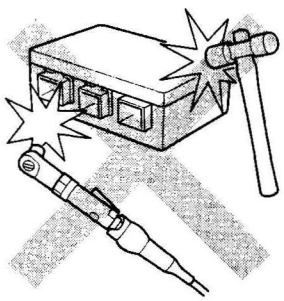
- Refer to the scrapping procedures for disposal of the damaged airbag.

BACK

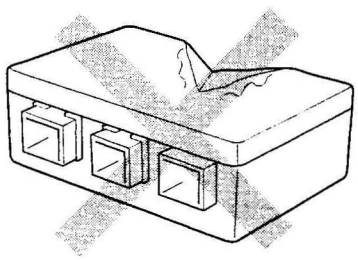
Protected by AR

SRS Unit-'99-03 models and Side Impact Sensors-'00-03 models

- Be careful not to bump or impact the SRS unit or side impact sensors whenever the ignition switch is ON (II), or at least for 3 minutes after the ignition switch is turned OFF.
- During installation or replacement, be careful not to bump (by impact wrench, hammer, etc.) the area around the SRS unit and side impact sensor. The airbags could accidentally deploy and cause damage or injury.



- After a collision in which the airbags were deployed, replace the SRS unit. After a collision in which the side airbag was deployed, replace the side impact sensor on the deployed side and the SRS unit. After a collision in which the airbags or the side airbags did not deploy, inspect for any damage or any deformation on the SRS unit and the side impact sensors . If there is any damage, replace the SRS unit and/or the side impact sensors.



- Do not disassemble the SRS unit or side impact sensors.
- Turn the ignition switch OFF, disconnect the battery negative cable and wait at least 3 minutes before beginning installation or replacement of the SRS unit, or disconnecting the connectors from the SRS unit.
- Be sure the SRS unit and side impact sensors are installed securely with the mounting bolts torqued to 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
- Do not spill water or oil on the SRS unit or the side impact sensors and keep them away from dust.
- Store the SRS unit and the side impact sensors in a cool (less than 104° F/40° C) and dry (less than 80% relative humidity, no moisture) area.

(cont'd)

BACK

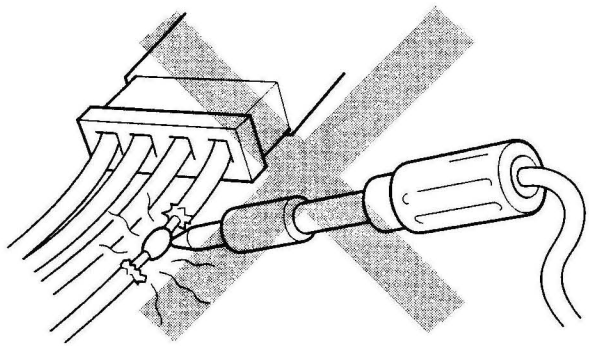
Protected by AR

Precautions and Procedures (cont'd)

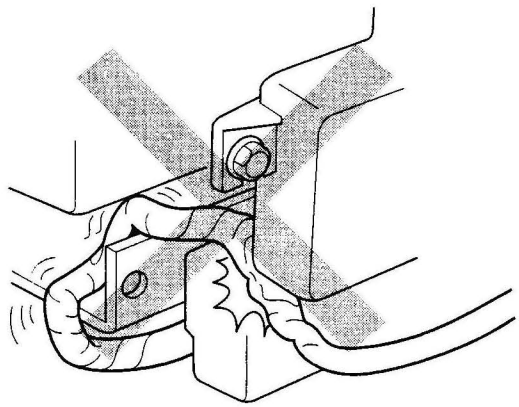
Wiring Precautions

Some of the SRS wiring can be identified by special yellow outer covering, and the SRS connectors can be identified by their yellow color.
Observe the instructions described in this section.

- Never attempt to modify, splice, or repair SRS wiring. If there is an open or damage in SRS wiring, replace the harness.



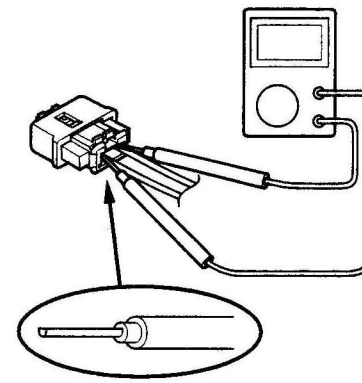
- Be sure to install the harness wires so that they are not pinched, or interfere with other parts.



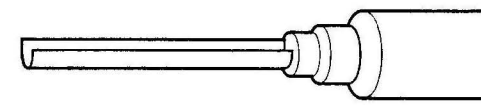
- Make sure all SRS ground locations are clean, and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

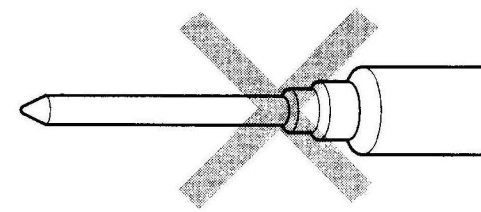
Precautions for Electrical Inspections

- When using electrical test equipment, insert the probe of the tester into the wire side of the connector. Do not insert the probe of the tester into the terminal side of the connector, and do not tamper with the connector.



- Use a u-shaped probe. Do not insert the probe forcibly.





- Use specified service connectors in troubleshooting. Using improper tools could cause an error in inspection due to poor metal-to-metal contact.

BACK

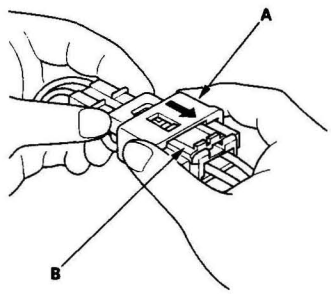
Protected by AR

Spring-loaded Lock Connector

Some SRS system connectors have a spring-loaded lock.

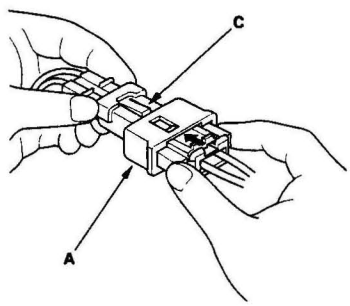
Front Airbag Connectors:

Disconnecting
To release the lock, pull the spring-loaded sleeve (A) toward the stop (B) while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector.

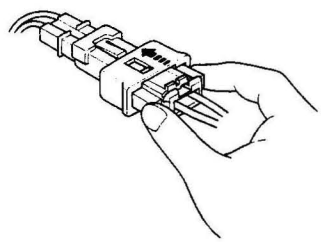


Connecting

1. To reconnect, hold the pawl-side connector half, and press on the back of the sleeve-side connector half in the direction shown. As the two connector halves are pressed together, the sleeve (A) is pushed back by the pawl (C). Do not touch the sleeve.

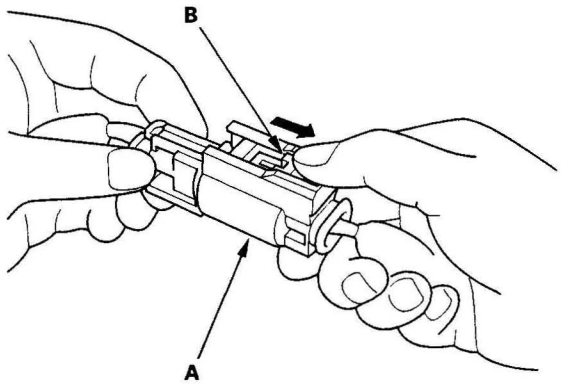


2. When the connector halves are completely connected, the pawl is released, and the spring-loaded sleeve locks the connector.

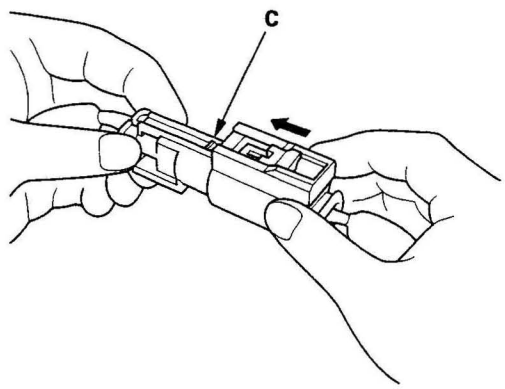


Side Airbag Connector:

Disconnecting
To release the lock, pull the spring-loaded sleeve (A) and the slider (B) while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector half.



Connecting
Hold the both connector halves, and press them forcibly until the projection (C) of the sleeve-side connector clicks to lock.



(cont'd)

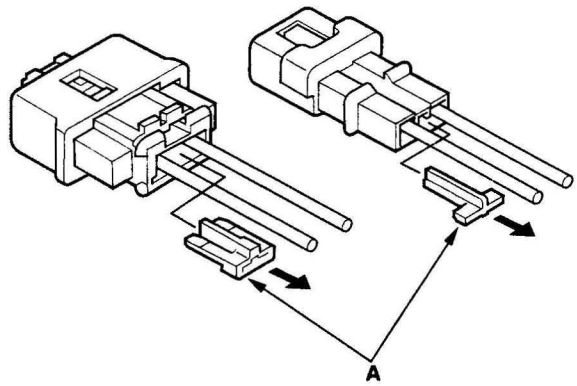
Protected by AR

Precautions and Procedures (cont'd)

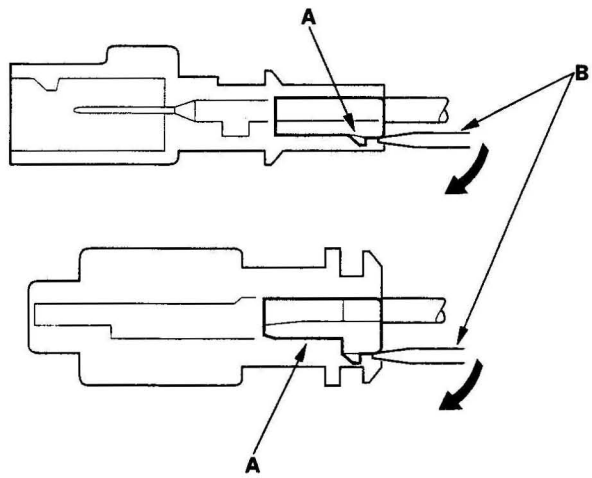
Backprobing Spring-loaded Lock Connectors

When checking voltage or resistance on this type of connector the first time, you must remove the retainer to insert the tester probe from the wire side.

NOTE: It is not necessary to reinstall the removed retainer; the terminals will stay locked in the connector housing.



To remove the retainer (A), insert a flat-tip screwdriver (B) between the connector body and the retainer, then carefully pry out the retainer. Take care not to break the connector.



Seats with Side Airbags

Seats with side airbag have a "SIDE AIRBAG" tag on the seat-back. Because the component parts (seat-back cover, cushion, etc.) of seats with and without airbags are different, make sure you install only the correct replacement parts.



- When cleaning, do not saturate the seat with liquid, and do not spray steam on the seat.
- Do not repair torn or frayed seat-back covers. Replace the seat-back cover.
- After a collision in which the side airbag was deployed, replace the seat-back cover and the side airbag with new parts. If the seat-back cushion is split, it must be replaced. If the seat-back frame is deformed, it must be replaced.

BACK

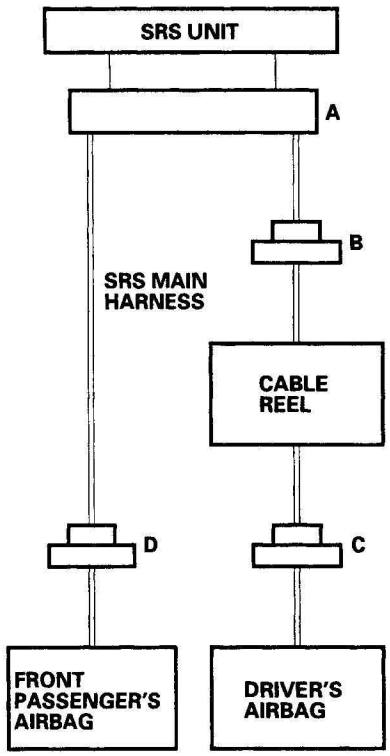
Protected by AR

Disconnecting System Connectors-'99 Model

Before removing the airbag or SRS related devices (the SRS unit and the cable reel), disconnecting connectors from SRS related devices, or removing the dashboard or the steering column, disconnect the airbag connectors from the airbags to prevent accidental deployment.

Turn the ignition switch OFF and disconnect the negative cable from the battery, and wait at least 3 minutes before beginning the following procedures.

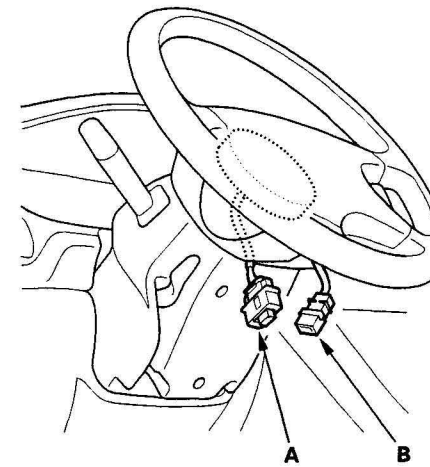
- Before disconnecting the SRS main harness 18P connector (A) from the SRS unit, disconnect both airbag 2P connectors (C, D).
- Before disconnecting the cable reel 2P connector (B), disconnect the driver's airbag 2P connector (C).



Disconnect the negative battery cable, and wait at least 3 minutes.

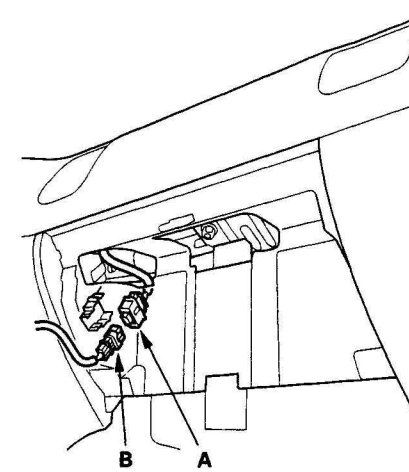
Driver's Airbag:

Remove the access panel from the steering wheel, then disconnect the driver's airbag 2P connector (A) and cable reel 2P connector (B).



Front Passenger's Airbag:

Remove the glove box, then disconnect the front passenger's airbag 2P connector (A) and SRS main harness 2P connector (B).



(cont'd)

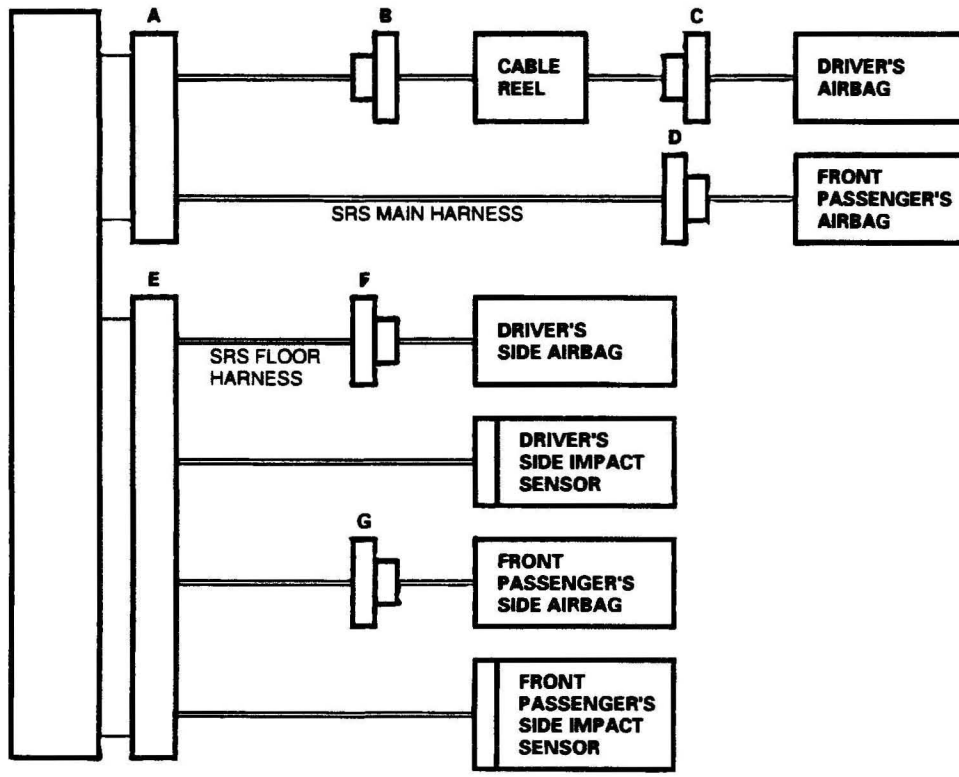
Protected by AR

Precautions and Procedures (cont'd)

Disconnecting the System Connectors '00-01 Models

Before removing a front airbag, side airbag or other SRS related devices (the SRS unit, the cable reel and the side impact sensors), disconnecting connectors from related devices, or removing the dashboard or the steering column, disconnect the airbag connectors or the side airbag connectors to prevent accidental deployment.
Turn the ignition switch OFF and disconnect the negative cable from the battery, and wait at least 3 minutes before beginning the following procedures.

- Before disconnecting the SRS main harness 18P connector (A) from the SRS unit, disconnect the driver's airbag 2P connector (C) and the front passenger's airbag 4P connentor (D).
- Before disconnecting the SRS floor harness 14P connector (E) from the SRS unit, disconnect both side airbag 2P connectors (F, G).
- Before disconnecting the cable reel 2P connector (B), disconnect the driver's airbag 2P connentor (C).



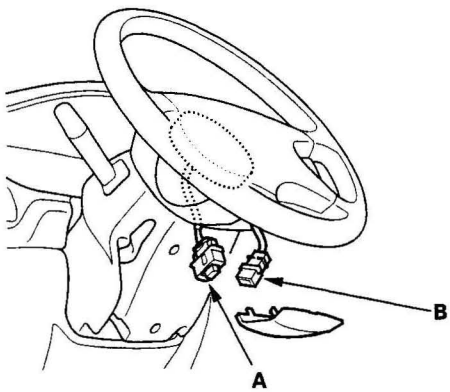
BACK

Protected by AR

1. Disconnect the negative battery cable, and wait at least 3 minutes.

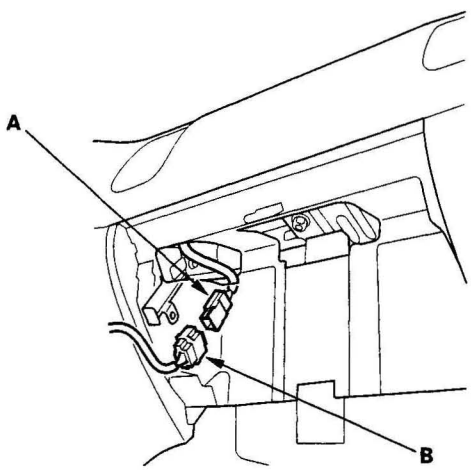
Driver's Airbag

2. Remove the access panel from the steering wheel, then disconnect the driver's airbag 2P connector (A) and cable reel 2P connector (B).



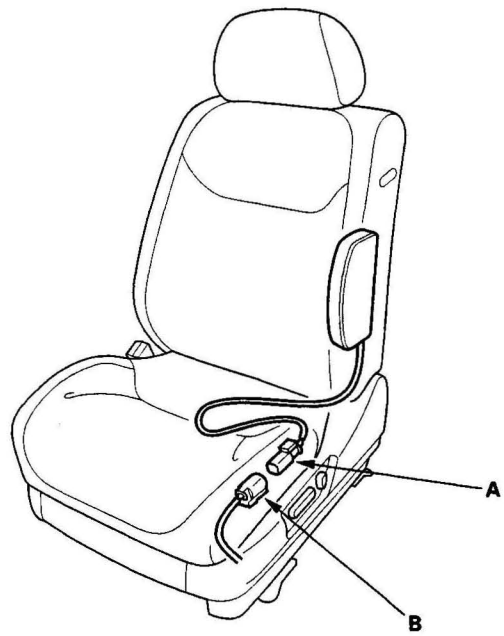
Front Passenger's Airbag

3. Remove the glove box, then disconnect the front passenger's airbag 4P connector (A) and SRS main harness 4P connector (B).



Side Airbag

4. Disconnect the side airbag 2P connector (A) from the SRS floor harness 2P connectors (B) or both side wire harness 2P connectors (B).



(cont'd)

BACK

Protected by AR

Precautions and Procedures (cont'd)

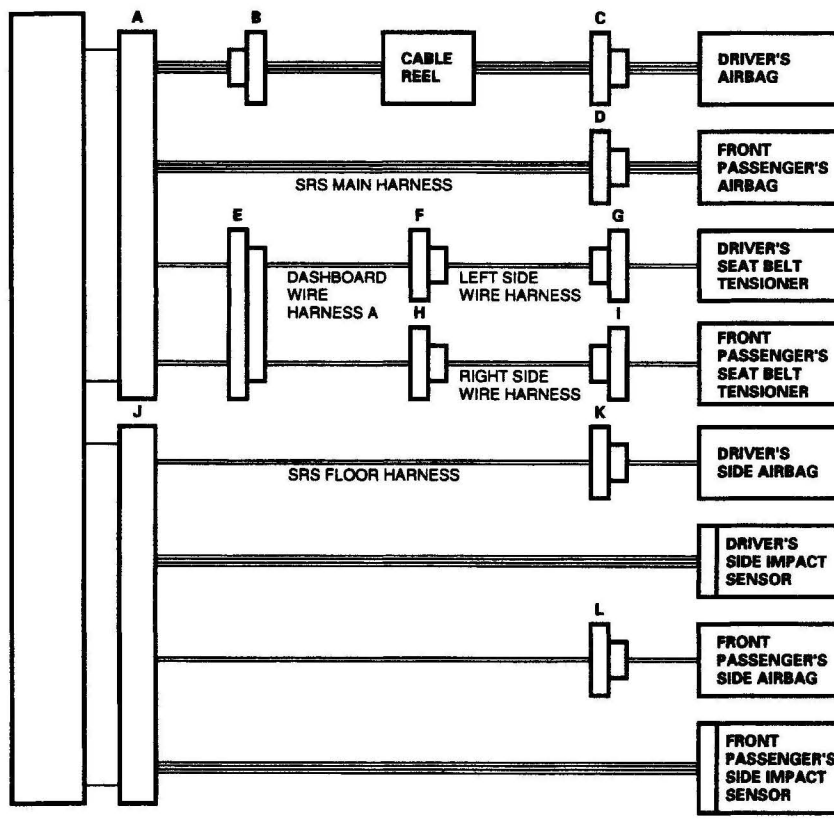
Disconnecting System Connectors—'02-03 Models

Before removing a front airbag, side airbag or other SRS related devices (the SRS unit, the cable reel, the side impact sensors and the seat belt tensioner connector), disconnecting connectors from related devices, or removing the dashboard or the steering column, disconnect the airbag connectors or the side airbag connectors to prevent accidental deployment.
Turn the ignition switch OFF and disconnect the negative cable from the battery, and wait at least 3 minutes before beginning the following procedures.

- Before disconnecting the SRS main harness 18P connector (A) from the SRS unit, disconnect the driver's airbag 4P connector (C), the front passenger's airbag 4P connector (D), the driver's seat belt tensioner 2P connector (G) and the front passenger's seat belt tensioner 2P connector (I).

- Before disconnecting the SRS floor harness 14P connector (J) from the SRS unit, disconnect both side airbag 2P connectors (K, L).

- Before disconnecting the cable reel 4P connector (B), disconnect the driver's airbag 4P connentor (C).
- Before disconnecting the SRS main harness 4P connector (E), disconnect the driver's seat belt tensioner 2P connector (G) and front passenger's seat belt tensioner 2P connector (I).



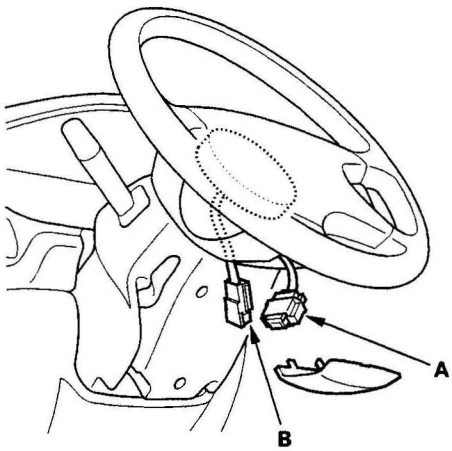
BACK

Protected by AR

1. Disconnect the negative battery cable, and wait at least 3 minutes.

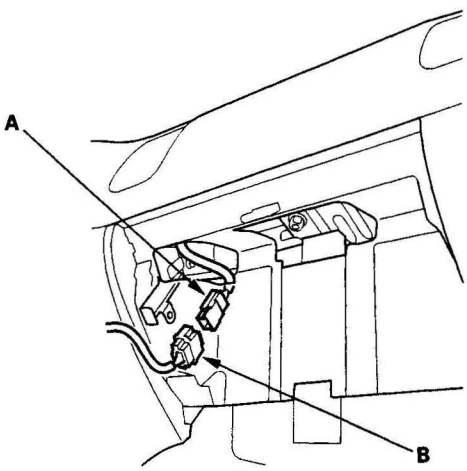
Driver's Airbag

2. Remove the access panel from the steering wheel, then disconnect the driver's airbag 2P or 4P connector (A) from the cable reel 2P or 4P connector (B).



Front Passenger's Airbag

3. Remove the glove box, then disconnect the front passenger's airbag 2P or 4P connector (A) from the SRS main harness 2P or 4P connector (B).



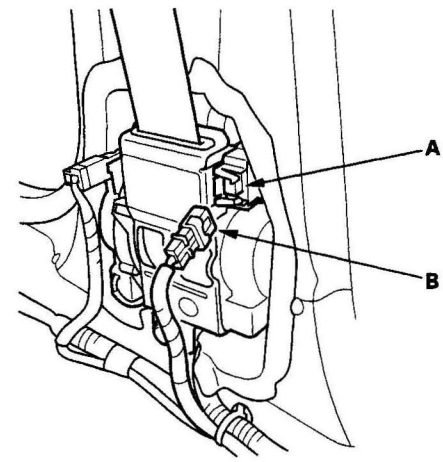
Side Airbag

4. Disconnect both side airbag 2P connectors (A) from the side wire harness 2P connectors (B).



Seat belt Tensioner

5. Disconnect both seat belt tensioner 2P connectors (A) from the side wire harness 2P connector (B).



BACK

Protected by AR

General Troubleshooting Information

DTC (Diagnostic Trouble Codes)

The self-diagnostic function of the SRS system allows it to locate the causes of system problems and then store this information in memory. For easier troubleshooting, this data can be retrieved via a data link circuit.

- When you turn the ignition switch ON (II), the SRS indicator will come on. If it goes off after 6 seconds, the system is normal.
- If there is an abnormality, the system locates and defines the problem, stores this information in memory, and turns the SRS indicator on. The data will remain in the memory even when the ignition switch is turned off or if the battery is disconnected.
- When you connect the Honda PGM Tester to the 16P data link connector (DLC) to short the SCS terminal, and turn the ignition switch ON (II), the SRS indicator will indicate the diagnostic trouble code (DTC) by the number of blinks.
- After reading and recording the DTC, proceed with the troubleshooting procedure for this code.

Precautions

- Use only a digital multimeter to check the system. If it's not a Honda multimeter, make sure it's output is 10 mA (0.01 A) or less when switched to the smallest value in the ohmmeter range. A tester with a higher output could damage the airbag circuit or cause accidental airbag deployment and possible injury.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than 3 minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- Before you remove the SRS main harness, disconnect the driver's airbag connector and the front passenger's airbag connector.
- Before you remove the SRS floor harness, disconnect the driver's side airbag connector and the front passenger's side airbag connector.
- Make sure the battery is sufficiently charged. If the battery is dead or low, measuring values won't be correct.
- Do not touch a tester probe to the terminals in the SRS unit or harness connectors, and do not connect the terminals with a jumper wire. Use only the backprobe set and the Honda PGM Tester. Backprobe spring-loaded lock type connectors correctly.

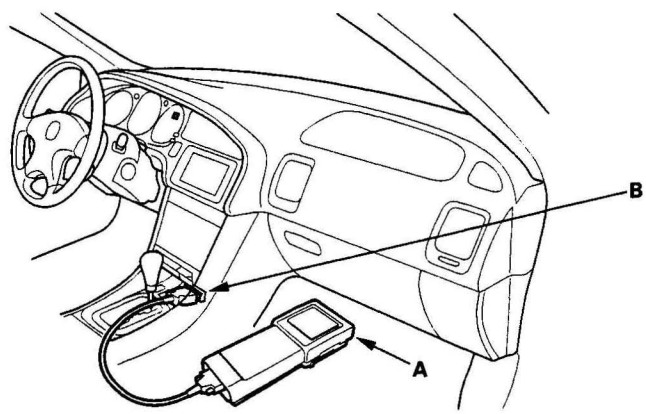
Reading the DTC

When the SRS indicator is on, read the DTC using either of the following methods:

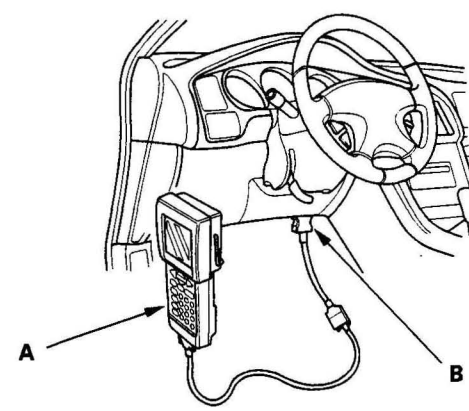
PGM Tester Method

Connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC)(B), and follow the tester's prompts in the "SRS" menu. If the tester indicates no DTC, no communication, DTC 9-1 or DTC 9-2, double-check by using the "SCS" menu method.

'99-01 Models



'02-03 Models



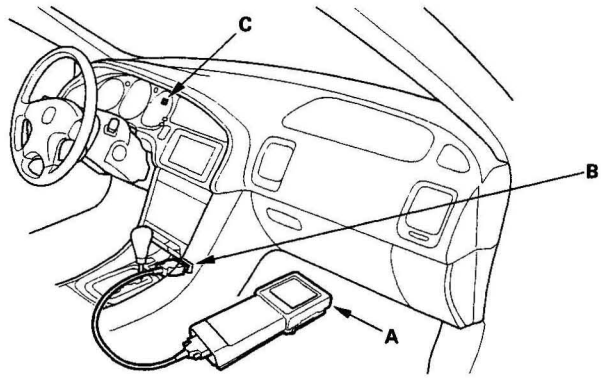
BACK

Protected by AR

SRS Indicator Method-'99 Model

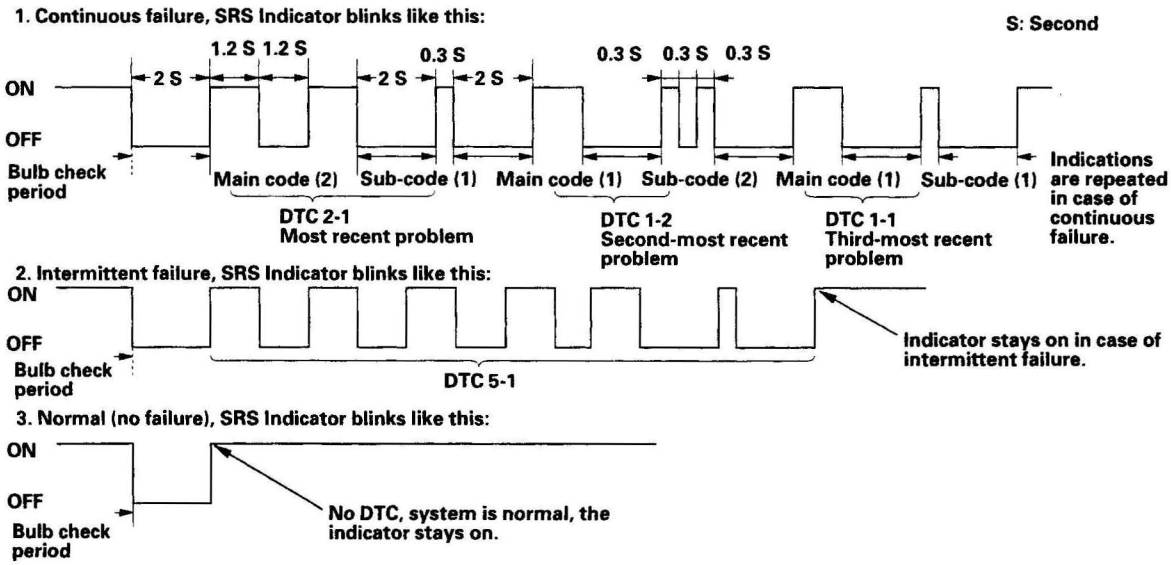
The SRS indicator indicates the DTC by the number of blinks when the Honda PGM Tester is connected to the DLC (data link connector) (16P).

1. Make sure the ignition switch is OFF.
2. Connect the Honda PGM Tester (A) to the DLC (16P)(B), and follow the tester's prompts in the "SCS" menu (see the Honda PGM Tester Operator's Manual).



3. Turn the ignition switch ON (II). The SRS indicator (C) should come on for about 6 seconds, and then go off. Then it will blink to indicate DTCs (see the table below).

- The DTC consists of a main code and a sub-code.
- Including the most recent problem, up to three different malfunctions can be indicated.
- In case of a continuous failure, the DTC will be indicated repeatedly (see example 1 below).
- In case of an intermittent failure, the SRS indicator will indicate the DTC one time, then it will stay on (see example 2 below).
- If a continuous and an intermittent failure occur, both DTCs will be indicated as continuous failures.
- In case the system is normal (no DTC), the SRS indicator will stay on (see example 3).



4. Read the DTC.
5. Turn the ignition switch OFF, and wait for 10 seconds.
6. Disconnect the Honda PGM Tester from the DLC (16P).

(cont'd)

BACK

Protected by AR

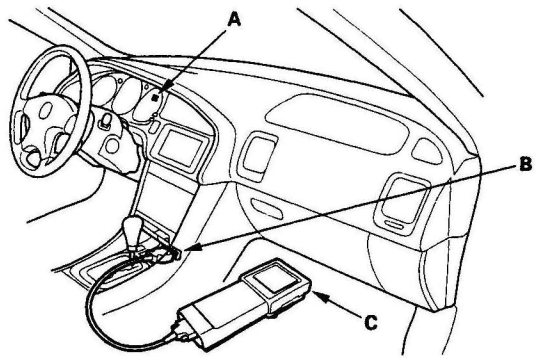
General Troubleshooting Information (cont'd)

SRS Indicator Method-'00-03 Models

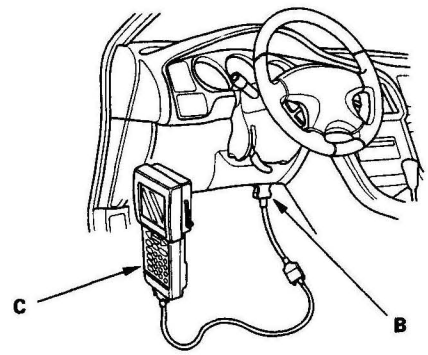
The SRS indicator (A) indicates the DTC by the number of blinks when the Honda PGM Tester (C) is connected to the DLC (data link connector) (16P) (B).

1. Make sure the ignition switch is OFF.
2. Connect the Honda PGM Tester (C) to the DLC (16P) (B), and follow the tester's prompts in the "SCS" menu (see the Honda PGM Tester Operator's Manual).

'00-01 Models



'02-03 Models

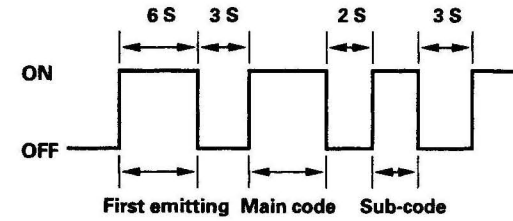


3. Turn the ignition switch ON (II). The SRS indicator (A) comes on for about 6 seconds, and then goes off. Then it will blink to indicate the DTCs (see the table below).
4. Read the DTC.
5. Turn the ignition switch OFF, and wait for 10 seconds.
6. Disconnect the Honda PGM Tester (C) from the DLC (16P) (B).

Patterns of DTC Indications:

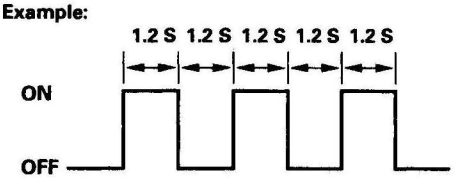
The DTC consists of a main code and sub-code.

S: Second



In case of 1 ~ 10
Count the number of the blinks.

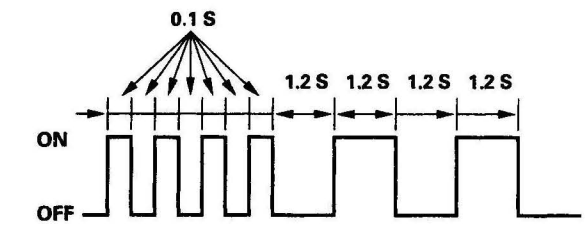
Example:



Main code= 1 + 1 + 1 = 3

In case of 11 ~ 15
Four fast blinks count as ten.
Add any further blinks together as shown.

Example:

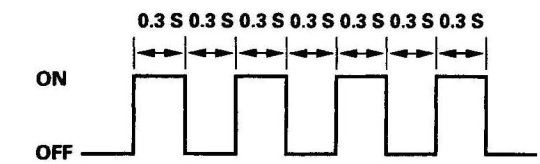


Main code= 10 + 1 + 1 = 12

Reading the sub code:

Count the number of the blinks.

Example:



Sub code= 1 + 1 + 1 + 1 = 4

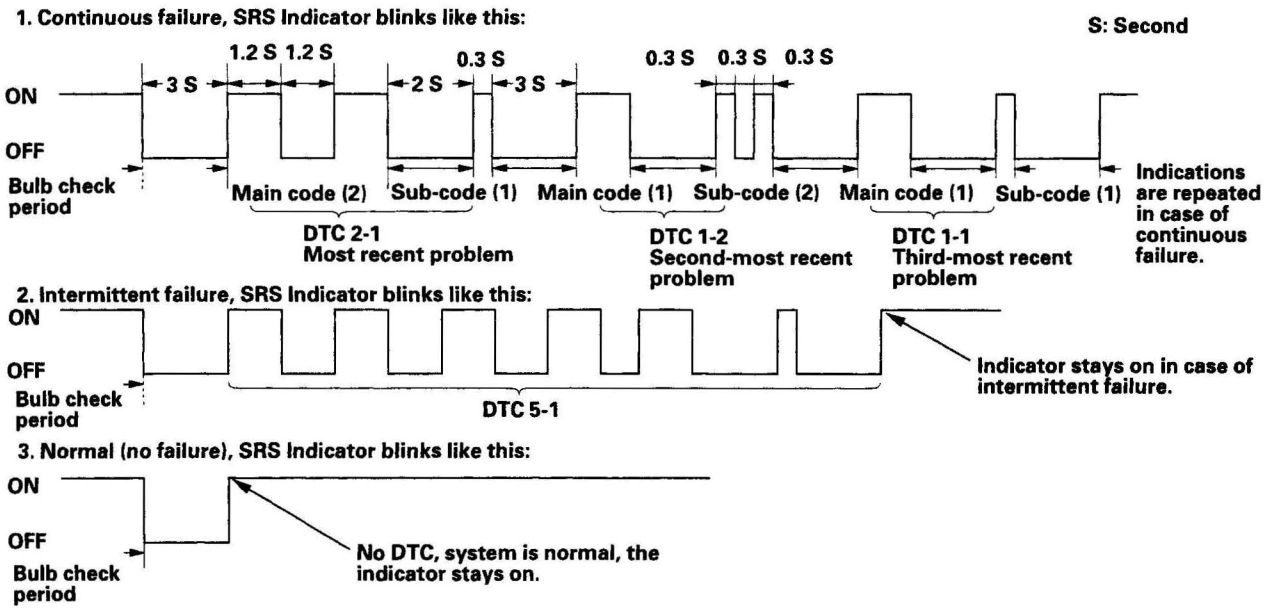
If the main code is '3', and the sub code is '4', record a DTC 3-4.

BACK

Protected by AR

- Including the most recent problem, up to three different malfunctions can be indicated (see example 1 below).
- In case of a continuous failure, the DTC will be indicated repeatedly (see example 1 below).
- In case of an intermittent failure, the SRS indicator will indicate the DTC one time, then it will stay on (see example 2 below).
- If both a continuous and an intermittent failure occur, both DTCs will be indicated as continuous failures.
- When the system is normal (no DTC), the SRS indicator light will stay on (see example 3).
- If the SRS indicator comes on continuously without a DTC, there may be a problem with the system.
- If the SRS indicatort does not come on, always check for an open or a short to ground in the SCS circuit before troubleshooting the system.

Example of the DTC Indications:



(cont'd)

Protected by AR

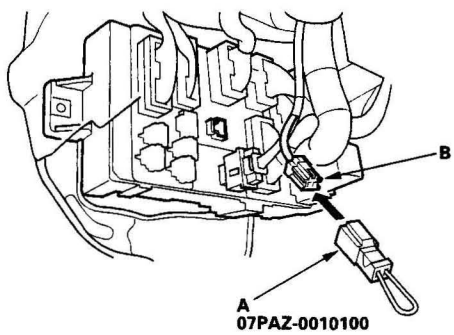
General Troubleshooting Information (cont'd)

Erasing the DTC Memory

Special Tools Required
SCS Service Connector 07PAZ-0010100

To erase the DTC(s) from the SRS unit, use a Honda PGM Tester (see the Honda PGM Tester SRS vehicle System Supplement) or the following procedure.

1. Make sure the ignition switch is OFF.
2. Connect the SCS service connector (A) to the MES connector (2P)(B). Do not use a jumper wire.



3. Turn the ignition switch ON (II).
4. The SRS indicator will come on for about 6 seconds, and then go off. Remove the SCS service connector from the MES connector (2P) within 4 seconds after the indicator goes off.
5. The SRS indicator will come on again. Reconnect the SCS service connector to the MES connector (2 P) within 4 seconds after the indicator comes on.
6. When the SRS indicator goes off, remove the SCS service connector from the MES connector (2P) within 4 seconds.
7. The SRS indicator will blink two times indicating that the memory has been erased.
8. Turn the ignition switch OFF, and wait for 10 seconds.
9. Turn the ignition switch ON (II) again. The SRS is OK if the SRS indicator comes on for 6 seconds, and then goes off.

Troubleshooting Intermittent Failures

If there was a malfunction, but it doesn't recur, it will be stored in the memory as an intermittent failure, and the SRS indicator light will come on.

After checking the DTC, troubleshoot as follows:

1. Read the DTC (see "Reading DTCs").
2. Erase the DTC memory (see "Erasing the DTC Memory").
3. With the shift lever in Park or neutral, start the engine, and let the engine idle.
4. The SRS indicator will come on for about 6 seconds and then go off.
5. Shake the wire harness and the connectors, take a test drive (quick acceleration, quick braking, cornering), turn the steering wheel fully left and right, and hold it there for 5 to 10 seconds. If the problem recurs, the SRS indicator will come on.
6. If you can't duplicate the intermittent failure, the system is OK at this time.

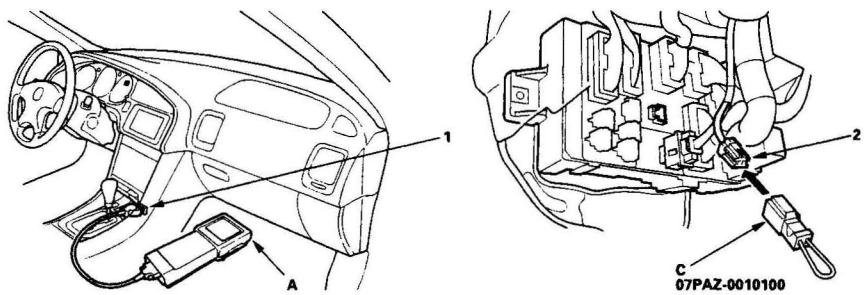
BACK

Protected by AR

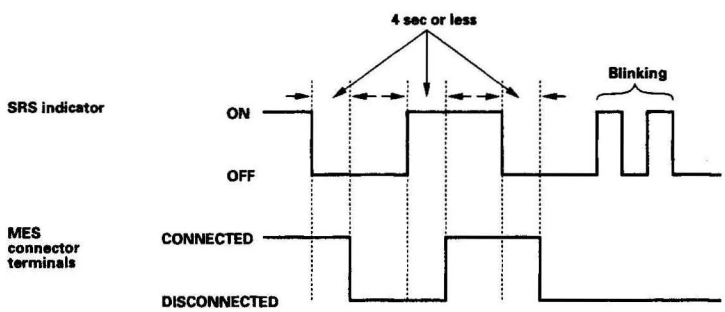
Initializing the OPDS (Occupant Position Detection System) Unit '00-03 Models

When a seat-back cover, seat-back cushion, and/or OPDS unit is replaced, initialize the OPDS by following the procedure below.
NOTE: Make sure the front passenger's seat is dry. Set the seat-back in the normal position, and make sure there is nothing on the front passenger's seat.

1. Make sure the ignition switch is OFF.
2. Connect the Honda PGM Tester (A) to the DLC (16P) (1), and follow the Tester's prompts in the "SCS" menu to ground the SCS line (see the Honda PGM Tester Operator's Manual).
3. Connect the SCS service connector (B) to the MES connector (2P) (2). Do not use a jumper wire.



4. Turn the ignition switch ON (II).
5. The SRS indicator comes on for about 6 seconds and goes off. Remove the SCS service connector from the MES connector within 4 seconds after the SRS indicator went off.
6. The SRS indicator comes on again. Reconnect the SCS service connector to the MES connector within 4 seconds after the SRS indicator comes on.
7. The SRS indicator goes off. Remove the SCS service connector from the MES connector within 4 seconds.
8. Watch the SRS indicator.
   - If the indicator blinks two times and then stays on, the OPDS is initialized, but the DTCs need to be erased. Go to step 9, then erase the DTCs.
   - If the indicator blinks two times and then goes off, the OPDS unit is initialized. Go to step 9.
   - If the indicator stays on without first blinking, the OPDS is not initialized. Read the DTC. If DTC 15-1 is indicated, repeat the initialization procedure. If an other DTC is indicated, go to the appropriate page in the DTC Troubleshooting Index.
9. Turn the ignition switch off, and disconnect the PGM Tester.



BACK

Protected by AR

DTC Troubleshooting Index

'99 Model

DTC	Detection Item	Notes
1-1	Open in driver's airbag inflator	(see page 23-52)
1-2	Increased resistance in driver's airbag inflator	(see page 23-52)
1-3	Short to another wire or decreased resistance in driver's airbag inflator	(see page 23-54)
1-4	Short to power in driver's airbag inflator	(see page 23-56)
1-5	Short to ground in driver's airbag inflator	(see page 23-58)
2-1	Open in front passenger's airbag inflator	(see page 23-60)
2-2	Increased resistance in front passenger's airbag inflator	(see page 23-60)
2-3	Short to another wire or decreased resistance in front passenger's airbag inflator	(see page 23-61)
2-4	Short to power in front passenger's airbag inflator	(see page 23-63)
2-5	Short to ground in front passenger's airbag inflator	(see page 23-64)
5-1 5-4 6-1 6-2 6-3 6-4 7-1 7-2 7-3 8-1 8-2	Internal failure of SRS unit NOTE: Before troubleshooting DTCs 5-1 through 8-2, check battery/system voltage. If voltage is low, repair the charging system bofore troubleshooting the SRS.	(see page 23-66)
8-6	Internal failure of SRS unit or two failures at a time	(see page 23-67)
9-1	Internal failure of the SRS unit. If intermittent, it could mean internal failure of the unit or a faulity indicator circuit. Refer to Troubleshooting Intermittent Failures (see page 23-32). NOTE: Before troubleshooting DTC 9-1 or 9-2, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	(see page 23-54)
9-2	Internal failure of the SRS unit. If intermittent, it could mean internal failure of the power supply (VB line). Refer to Troubleshooting Intermittent Failures (see page 23-32). NOTE: Before troubleshooting DTC 9-1 or 9-2, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	
10-1	SRS airbag deployed (SRS unit must be replaced).	(see page 23-66)

BACK

Protected by AR

'00-01 Models

DTC	Detection Item	Notes
1-1	Open in driver's airbag inflator	(see page 23-69)
1-2	Increased resistance in driver's airbag inflator	(see page 23-69)
1-3	Short to another wire or decreased resistance in driver's airbag inflator	(see page 23-71)
1-4	Short to power in driver's airbag inflator	(see page 23-73)
1-5	Short to ground in driver's airbag inflator	(see page 23-75)
2-1	Open in front passenger's airbag inflator	(see page 23-77)
2-2	Increased resistance in front passenger's airbag inflator	(see page 23-77)
2-3	Short to another wire or decreased resistance in front passenger's airbag inflator	(see page 23-78)
2-4	Short to power in front passenger's airbag inflator	(see page 23-80)
2-5	Short to ground in front passenger's airbag inflator	(see page 23-81)
5-1	Internal failure of SRS unit	(see page 23-83)
5-2	NOTE: Before troubleshooting DTCs 5-1 through 8-8, check battery/system voltage. If voltage is low, repair the charging system bofore troubleshooting the SRS.	
5-4		
5-5		
5-8		
6-1		
6-2		
6-3		
6-4		
6-5		
6-6		
6-7		
6-8		
7-1		
7-2		
7-3		
8-1		
8-2		
8-5		
8-6		
8-7		
8-8		
9-1	Internal failure of the SRS unit. If intermittent, it could mean internal failure of the unit or a faulty indicator circuit. Refer to Troubleshooting Intermittent Failures (see page 23-32). NOTE: Before troubleshooting DTC 9-1 or 9-2, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	(see page 23-83)
9-2	Internal failure of the SRS unit. If intermittent, it could mean internal failure of the power supply (VB line). Refer to Troubleshooting Intermittent Failures (see page 23-32). NOTE: Before troubleshooting DTC 9-1 or 9-2, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	
9-3	Faulty driver's seat belt buckle switch	(see page 23-85)
9-4	Faulty front passenger's seat belt buckle switch	(see page 23-90)

(cont'd)

BACK

Protected by AR

DTC Troubleshooting Index (cont'd)

'00-01 Models

DTC	Detection Item	Notes
10-1	Airbags deployed	(see page 23-83)
10-2	Driver's side airbag deployed	
10-3	Airbags and driver's side airbag deployed	
10-4	Front passenger's side airbag deployed	
10-5	Airbags and front passnger's side airbag deployed	
10-6	Driver's and front passenger's side airbag deployed	
10-7	Airbags and driver's and front passenger's side airbags deployed	
11-1	Open in driver's side airbag inflator	(see page 23-96)
11-2	Increased resistance in driver's side airbag inflator	(see page 23-96)
11-3	Short to another wire or decreased resistance in driver's side airbag inflator	(see page 23-97)
11-4	Short to power in driver's side airbag inflator	(see page 23-99)
11-5	Short to ground in driver's side airbag inflator	(see page 23-100)
12-1	Open in front passenger's side airbag inflator	(see page 23-102)
12-2	Increase resistance in front passenger's side airbag inflator	(see page 23-102)
12-3	Short to another wire or decreased resistance in front passenger's side airbag inflator	(see page 23-103)
12-4	Short to power in front passenger's side airbag inflator	(see page 23-105)
12-5	Short to ground in front passenger's side airbag inflator	(see page 23-106)
13-1	Faulty driver's side impact sensor or SRS unit	(see page 23-108)
13-2		
13-3	No signal from the driver's side impact sensor	(see page 23-108)
13-4	Faulty power supply to the driver's side impact sensor	(see page 23-84)
13-5	Internal failure of the SRS unit	(see page 23-83)
14-1	Faulty front passenger's side impact sensor or SRS unit	(see page 23-109)
14-2		
14-3	No signal from the front passenger's side impact sensor	(see page 23-109)
14-4	Faulty power supply to the front passenger's side impact sensor	(see page 23-84)
14-5	Internal failure of the SRS unit	(see page 23-83)
15-1	Faulty OPDS unit or OPDS system not initialized	(see page 23-110)
15-2	Faulty side airbag cutoff indicator circuit	(see page 23-115)
15-3	Faulty OPDS sensor	(see page 23-120)

BACK

Protected by AR

'02-03 Models

DTC	Detection Item	Notes
1-1	Open in driver's airbag inflator	(see page 23-121)
1-2	Increased resistance in driver's airbag inflator	(see page 23-121)
1-3	Short to another wire or decreased resistance in driver's airbag inflator	(see page 23-123)
1-4	Short to power in driver's airbag inflator	(see page 23-125)
1-5	Short to ground in driver's airbag inflator	(see page 23-127)
2-1	Open in front passenger's airbag inflator	(see page 23-129)
2-2	Increased resistance in front passenger's airbag inflator	(see page 23-129)
2-3	Short to another wire or decreased resistance in front passenger's airbag inflator	(see page 23-131)
2-4	Short to power in front passenger's airbag inflator	(see page 23-133)
2-5	Short to ground in front passenger's airbag inflator	(see page 23-135)
3-1	Open in driver's seat belt tensioner	(see page 23-137)
3-2	Increased resistance in driver's seat belt tensioner	(see page 23-137)
3-3	Short to another wire or decreased resistance in driver's seat belt tensioner	(see page 23-139)
3-4	Short to power in driver's seat belt tensioner	(see page 23-141)
3-5	Short to ground in driver's seat belt tensioner	(see page 23-143)
4-1	Open in front passenger's seat belt tensioner	(see page 23-145)
4-2	Increased resistance in front passenger's seat belt tensioner	(see page 23-145)
4-3	Short to another wire or decreased resistance in front passenger's seat belt tensioner	(see page 23-147)
4-4	Short to power in front passenger's seat belt tensioner	(see page 23-149)
4-5	Short to ground in front passenger's seat belt tensioner	(see page 23-151)
5-1	Internal failure of SRS unit NOTE: Before troubleshooting DTCs 5-1 through 8-8, check battery/system voltage. If voltage is low, repair the charging system before troubleshooting the SRS.	(see page 23-153)
5-2		
5-3		
5-4		
5-5		
5-8		
6-1		
6-2		
6-3		
6-4		
6-5		
6-6		
6-7		
6-8		
7-1		
7-2		
7-3		
8-1		
8-2		
8-3		
8-4		
8-5		
8-6		
8-7		
8-8		

(cont'd)

BACK

Protected by AR

DTC Troubleshooting Index (cont'd)

'02-03Models

DTC	Detection Item	Notes
9-1	Internal failure of the SRS unit. If intermittent, it could mean internal failure of the unit or a faulty indicator circuit. Refer to Troubleshooting Intermittent Failures (see page 23-32). NOTE: Before troubleshooting DTC 9-1 or 9-2, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	(see page 23-153)
9-2	Internal failure of the SRS unit. If intermittent, it could mean internal failure of the power supply (VB line). Refer to Troubleshooting Intermittent Failures (see page 23-32). NOTE: Before troubleshooting DTC 9-1 or 9-2, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	
9-3	Faulty driver's seat belt buckle switch	(see page 23-155)
9-4	Faulty front passenger's seat belt buckle switch	(see page 23-160)
10-1	Seat belt tensioners (and airbag(s)) deployed	(see page 23-153)
10-2	Driver's side airbag deployed	
10-3	Seat belt tensioners (and airbag(s)) and driver's side airbag deployed	
10-4	Front passenger's side airbag deployed	
10-5	Seat belt tensioners (and airbag(s)) and front passnger's side airbag deployed	
10-6	Driver's and front passenger's side airbags deployed	
10-7	Seat belt tensioners (and airbag(s)) and driver's and front passenger's side airbags deployed	
11-1	Open in driver's side airbag inflator	(see page 23-164)
11-2	Increased resistance in driver's side airbag inflator	(see page 23-164)
11-3	Short to another wire or decreased resistance in driver's side airbag inflator	(see page 23-165)
11-4	Short to power in driver's side airbag inflator	(see page 23-167)
11-5	Short to ground in driver's side airbag inflator	(see page 23-168)
12-1	Open in front passenger's side airbag inflator	(see page 23-170)
12-2	Increase resistance in front passenger's side airbag inflator	(see page 23-170)
12-3	Short to another wire or decreased resistance in front passenger's side airbag inflator	(see page 23-171)
12-4	Short to power in front passenger's side airbag inflator	(see page 23-173)
12-5	Short to ground in front passenger's side airbag inflator	(see page 23-174)
13-1	Faulty driver's side impact sensor or SRS unit	(see page 23-176)
13-2		
13-3	No signal from the driver's side impact sensor	(see page 23-176)
13-4	Faulty power supply to the driver's side impact sensor	(see page 23-154)
13-5	Internal failure of the SRS unit	(see page 23-153)
14-1	Faulty front passenger's side impact sensor or SRS unit	(see page 23-177)
14-2		
14-3	No signal from the front passenger's side impact sensor	(see page 23-177)
14-4	Faulty power supply to the front passenger's side impact sensor	(see page 23-154)
14-5	Internal failure of the SRS unit	(see page 23-153)
15-1	Faulty OPDS unit or OPDS system not initialized	(see page 23-178)
15-2	Faulty side airbag indicator light circuit	(see page 23-182)
15-3	Faulty OPDS sensor	(see page 23-187)

BACK

Protected by AR

Symptom Troubleshooting Index

'99 Model

Symptom	Diagnostic procedure	Also check for
SRS indicator doesn't come on	SRS Indicator Troubleshooting (see page 23-188)	
SRS indicator stays on after the ignition switch is turned on (II)	SRS Indicator Troubleshooting (see step 1 on page 23-190)	
SRS indicator stays on, but no DTCs are stored (NEC SRS unit only)	SRS Indicator Troubleshooting (see step 1 on page 23-194)	

'00-01 Models

Symptom	Diagnostic procedure	Also check for
SRS indicator doesn't come on	SRS Indicator Troubleshooting (see page 23-197)	
SRS indicator stays on when in "SCS" menu method	SRS Indicator Troubleshooting (see step 1 on page 23-199)	Inability to retrieve DTCs with the PGM Tester. Retrieve the flash codes using the SCS menu method (see page 23-30).
SRS indicator stays on, but no DTCs are stored (NEC SRS unit only)	SRS Indicator Troubleshooting (see step 1 on page 23-202)	
• Side airbag cutoff indicator stays on after bulb check (If the indicator stays on, it does not set a DTC), and nothing is on the front passenger's seat. • Side airbag cutoff indicator is flashing.	• Make sure nothing is on the front passenger's seat. • If the side airbag cutoff indicator stays on after the ignition switch is turned ON (II), initialize the OPDS unit (see page 23-33). – If the side airbag cutoff indicator operates normally, the system is OK. – If the side airbag cutoff indicator stays on, replace the OPDS sensor (see section 20). The sensor is part of the seat-back pad.	DTC 15-2 troubleshooting

(cont'd)

BACK

Protected by AR

Symptom Troubleshooting Index (cont'd)

'02-03 Models

Symptom	Diagnostic procedure	Also check for
SRS indicator doesn't come on	SRS Indicator Troubleshooting (see page 23-205)	
SRS indicator stays on when in "SCS" menu method	SRS Indicator Troubleshooting (see step 1 on page 23-208)	Inability to retrieve DTCs with the PGM Tester. Retrieve the flash codes using the SCS menu method (see page 23-30).
SRS indicator stays on, but no DTCs are stored (NEC SRS unit only)	SRS Indicator Troubleshooting (see step 1 on page 23-215)	
• Side airbag cutoff indicator stays on after bulb check (If the indicator stays on, it does not set a DTC), and nothing is on the front passenger's seat. • Side airbag cutoff indicator is flashing.	• Make sure nothing is on the front passenger's seat. • If the side airbag cutoff indicator stays on after the ignition switch is turned ON (II), initialize the OPDS unit (see page 23-33). – If the side airbag cutoff indicator operates normally, the system is OK. – If the side airbag cutoff indicator stays on, replace the OPDS sensor (see section 20). The sensor is part of the seat-back pad.	DTC 15-2 trouble shooting

BACK

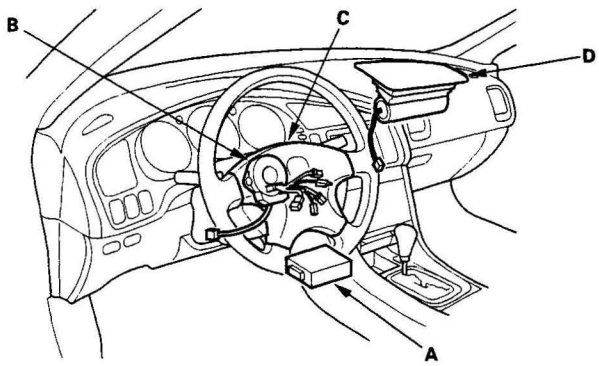
Protected by AR

System Description

'99 Model

SRS Components

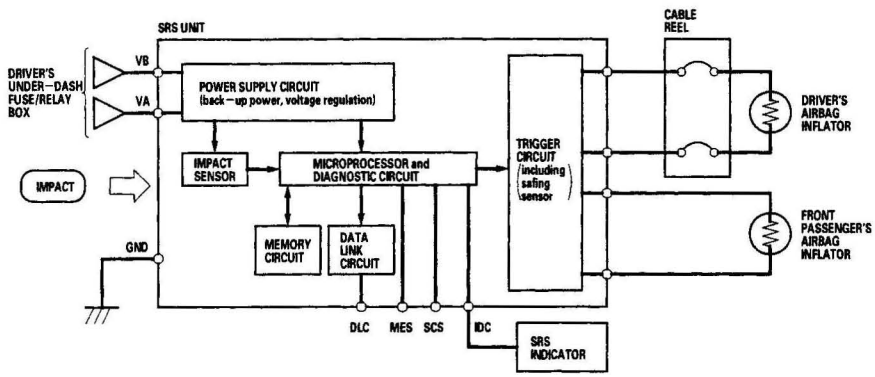
The SRS is a safety device which, when used in conjunction with the seat belt, is designed to help protect the driver and front passenger in a frontal impact exceeding a certain set limit. The system consists of the SRS unit, including safing sensor and impact sensor (A), the cable reel (B), the driver's airbag (C) and the front passenger's airbag (D).



SRS Operation

The main circuit in the SRS unit senses and judges the force of impact and, if necessary, ignites the inflator charges. If battery voltage is too low or power is disconnected due to impact, the voltage regulator and the back-up power circuit respectively will keep voltage at a constant level.

For the SRS to operate:
(1) The impact sensor must activate and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals and send them to the airbag inflators.
(3) The inflators must ignite and deploy the airbags.



Self-diagnosis System
A self-diagnosis circuit is built into the SRS unit; when the ignition switch is turned ON (II), the SRS indicator comes on and goes off after about 6 seconds if the system is operating normally.
If the indicator does not come on, or does not go off after 6 seconds, or if it comes on while driving, it indicates an abnormality in the system. The system must be inspected and repaired as soon as possible.

For better serviceability, the memory will store the cause of the malfunction, and the data link circuit passes on the information from the memory to the data link connector (DLC). This information can be read with the Honda PGM Tester connected to the DLC (16P).

BACK

Protected by AR

System Description (cont'd)

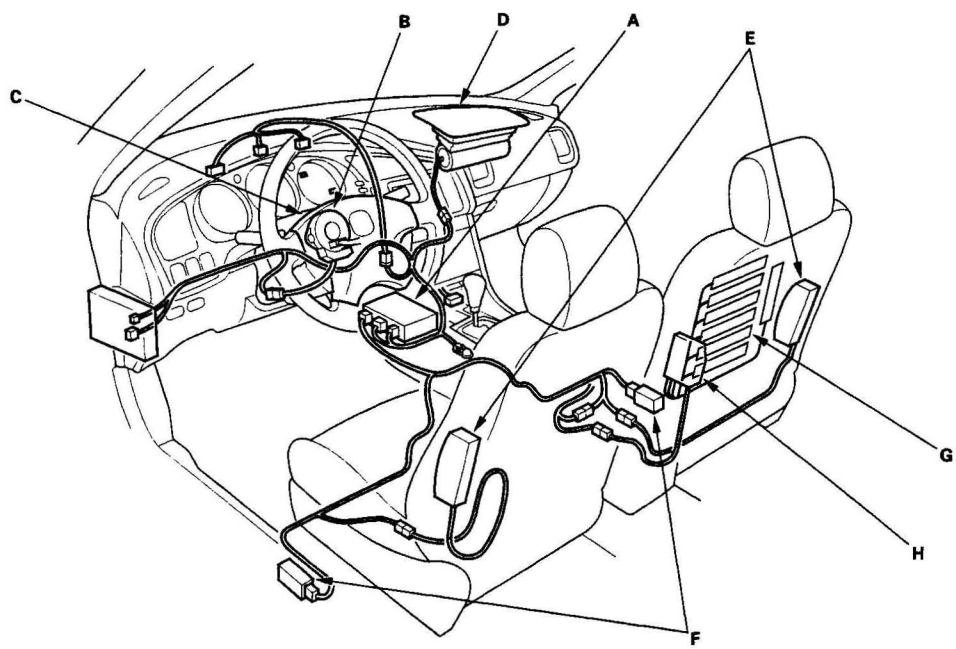
'00-01 Models

SRS Components

Airbags
The SRS is a safety device which, when used with the seat belt, is designed to help protect the driver and front passenger in a frontal impact exceeding a certain set limit. The system consists of the SRS unit, including safing sensor and impact sensor (A), the cable reel (B), the driver's airbag (C), the front passenger's airbag (D), side airbags (E), and seat belt tensioners (I).
Since both airbags use the same sensors, both airbags normally inflate at the same time. However, it is possible for only one airbag to inflate.
This can occur when the severity of a collision is at the margin, or threshold, that determines whether or not the airbags will deploy. In such cases, the seat belt will provide sufficient protection, and the supplemental protection offered by the airbag would be minimal.

Side Airbags
The side airbags (E) are in each front seat-back. They help protect the upper torso of the driver or front seat passenger during a moderate to severe side impact. Side impact sensors (F) in each door sill and in the SRS unit detect such an impact and instantly inflate the driver's or the passenger's side airbag. Only one side airbag will deploy during a side impact. If the impact is on the passenger's side, the passenger's side airbag will deploy even if there is no passenger.

OPDS
The side airbag system also includes an Occupant Position Detection System (OPDS). This system consists of sensors (G) and an OPDS unit (H) in the front passenger's seat-back. The OPDS unit sends occupant height and position data to the SRS unit. If the OPDS unit determines that the front passenger is of small stature (for example, a child) and the front passenger is leaning into the side airbag deployment path, the SRS unit will automatically disable the airbag. The SRS unit will also disable the airbag when the OPDS detects certain objects on the seat. When the side airbag is disabled, the Side Airbag cutoff indicator on the instrument panel alerts the driver that the passenger's side airbag will not deploy in a side impact. When the object is removed, or the passenger sits upright, the Side Airbag cutoff indicator will no longer be lit, alerting the driver that the side airbag will deploy in a side impact.



BACK

Protected by AR

SRS Operation

The main circuit in the SRS unit senses and judges the force of impact and, if necessary, ignites the inflator charges. If battery voltage is too low or power is disconnected due to the impact, the voltage regulator and the back-up power circuit, respectively, will keep voltage at a constant level.

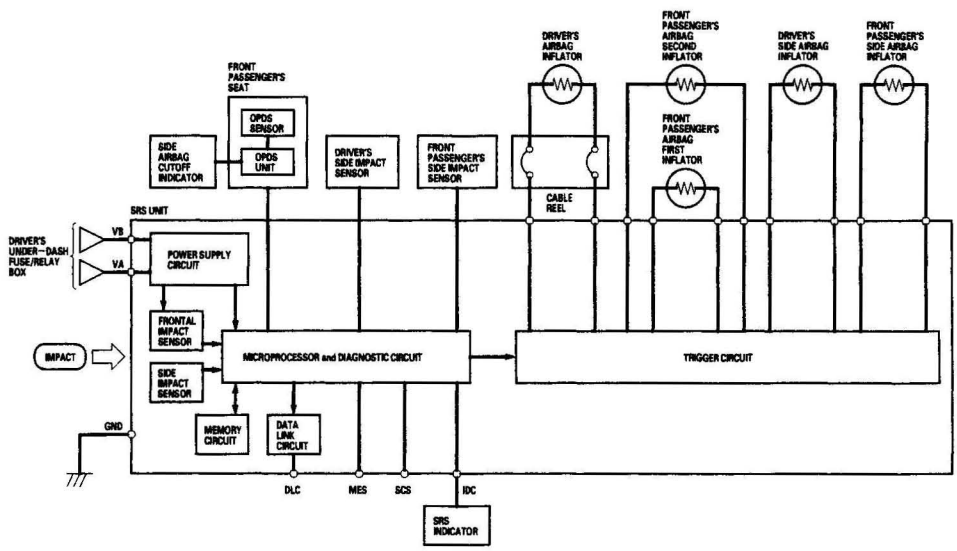
For the SRS to operate:

Driver's and Front Passenger's Airbag(s)

(1) The frontal impact sensor must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals, and depending on the severity of the collision and whether the seat belt buckle switch is ON or OFF, it sends the appropriate signals to the airbag inflator(s).
(3) The inflators that received signals must ignite and deploy the airbags.

Side Airbag(s)

(1) The side impact sensors must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals and send them to the side airbag inflator(s). However, the microprocessor cuts off the signals to the front passenger's side airbag if the SRS unit determines that the front passenger's head is in the deployment path of the side airbag.
(3) The inflator that received the signal must ignite and deploy the side airbag.



Self-diagnosis System

A self-diagnosis circuit is built into the SRS unit; when the ignition switch is turned ON (II), the SRS indicator light comes on and goes off after about 6 seconds if the system is operating normally.
If the light does not come on, or does not go off after 6 seconds, or if it comes on while driving, it indicates an abnormality in the system. The system must be inspected and repaired as soon as possible.

For better serviceability, the SRS unit memory stores a DTC that relates to the cause of the malfunction, and the unit is connected to the data link connector (DLC). This information can be read with the Honda PGM Tester when it is connected to the DLC (16P).

BACK

Protected by AR

System Description (cont'd)

'02-03 Models

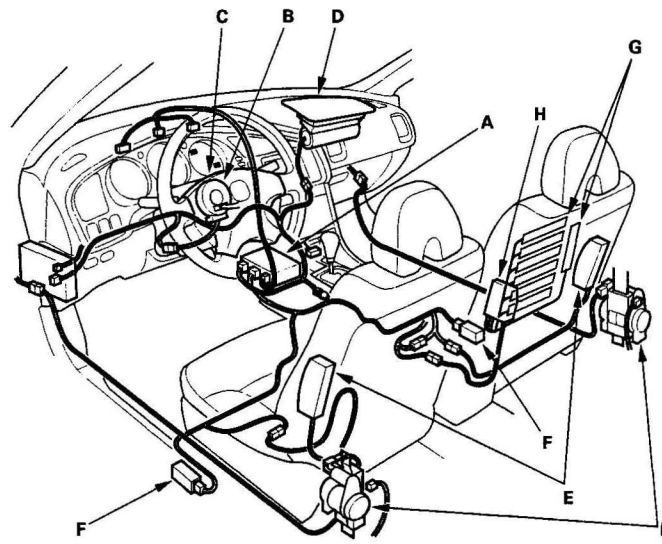
SRS Components

Airbags
The SRS is a safety device which, when used with the seat belt, is designed to help protect the driver and front passenger in a frontal impact exceeding a certain set limit. The system consists of the SRS unit, including safing sensor and impact sensor (A), the cable reel (B), the driver's airbag (C), the front passenger's airbag (D), side airbags (E), and seat belt tensioners (I).
Since both airbags use the same sensors, both airbags normally inflate at the same time. However, it is possible for only one airbag to inflate.
This can occur when the severity of a collision is at the margin, or threshold, that determines whether or not the airbags will deploy. In such cases, the seat belt will provide sufficient protection, and the supplemental protection offered by the airbag would be minimal.

Side Airbags
The side airbags (E) are in each front seat-back. They help protect the upper torso of the driver or front seat passenger during a moderate to severe side impact. Side impact sensors (F) in each door sill and in the SRS unit detect such an impact and instantly inflate the driver's or the passenger's side airbag. Only one side airbag will deploy during a side impact. If the impact is on the passenger's side, the passenger's side airbag will deploy even if there is no passenger.

Seat Belt Tensioner
The seat belt tensioners (I) are linked with the SRS airbags to further increase the effectiveness of the seat belt. In a front-end collision, the tensioner instantly retracts the belt firmly to secure the occupants in their seats.

OPDS
The side airbag system also includes an Occupant Position Detection System (OPDS). This system consists of sensors (G) and an OPDS unit (H) in the front passenger's seat-back. The OPDS unit sends occupant height and position data to the SRS unit. If the SRS unit determines that the front passenger is of small stature (for example, a child) and the front passenger is leaning into the side airbag deployment path, it will automatically disable the airbag. The SRS unit will also disable the airbag when the OPDS detects certain objects on the seat. When the side airbag is disabled, the Side Airbag indicator on the instrument panel alerts the driver that the passenger's side airbag will not deploy in a side impact. When the object is removed, or the passenger sits upright, the Side Airbag indicator will go off, alerting the driver that the side airbag will deploy in a side impact.



BACK

Protected by AR

SRS Operation

The main circuit in the SRS unit senses and judges the force of impact and, if necessary, ignites the inflator charges. If battery voltage is too low or power is disconnected due to the impact, the voltage regulator and the back-up power circuit, respectively, will keep voltage at a constant level.

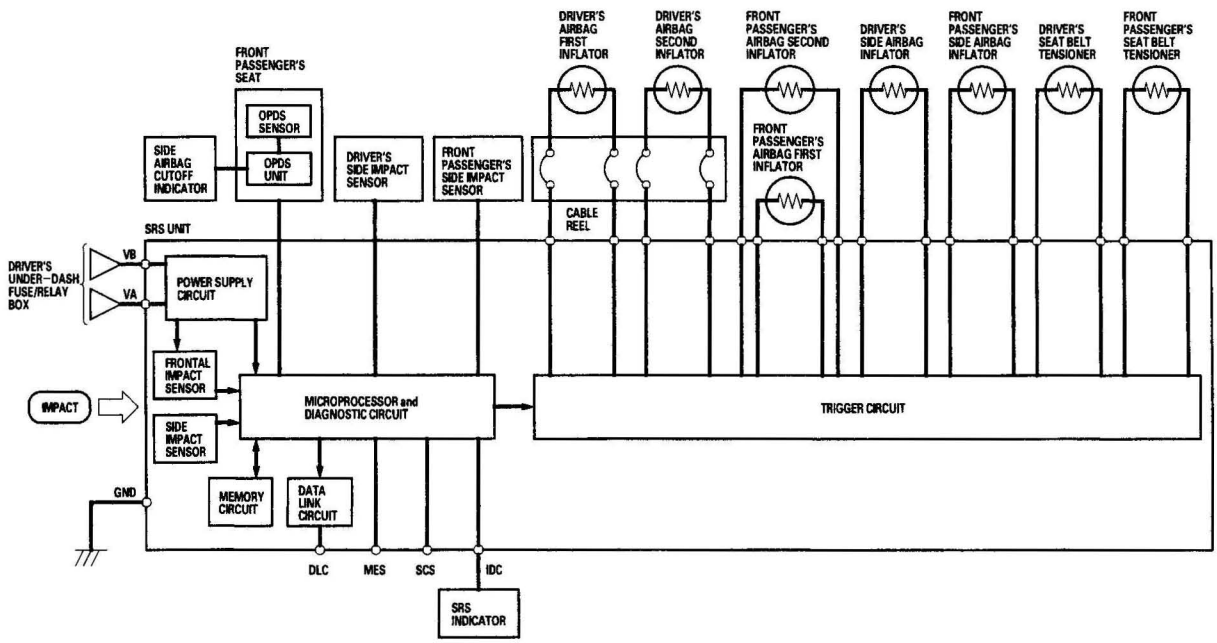
For the SRS to operate:

Driver's and Front Passenger's Airbag(s)

(1) The frontal impact sensor must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals, and depending on the severity of the collision and whether the seat belt buckle switch is ON or OFF, it sends the appropriate signals to the airbag inflator(s).
(3) The inflators that received signals must ignite and deploy the airbags.

Side Airbag(s)

(1) The side impact sensors must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals and send them to the side airbag inflator(s). However, the microprocessor cuts off the signals to the front passenger's side airbag if the SRS unit determines that the front passenger's head is in the deployment path of the side airbag.
(3) The inflator that received the signal must ignite and deploy the side airbag.



(cont'd)

BACK

Protected by AR

System Description (cont'd)

Self-diagnosis System
A self-diagnosis circuit is built into the SRS unit; when the ignition switch is turned ON (II), the SRS indicator light comes on and goes off after about 6 seconds if the system is operating normally.
If the light does not come on, or does not go off after 6 seconds, or if it comes on while driving, it indicates an abnormality in the system. The system must be inspected and repaired as soon as possible.

For better serviceability, the SRS unit memory stores a DTC that relates to the cause of the malfunction, and the unit is connected to the data link connector (DLC). This information can be read with the Honda PGM Tester when it is connected to the DLC (16P).

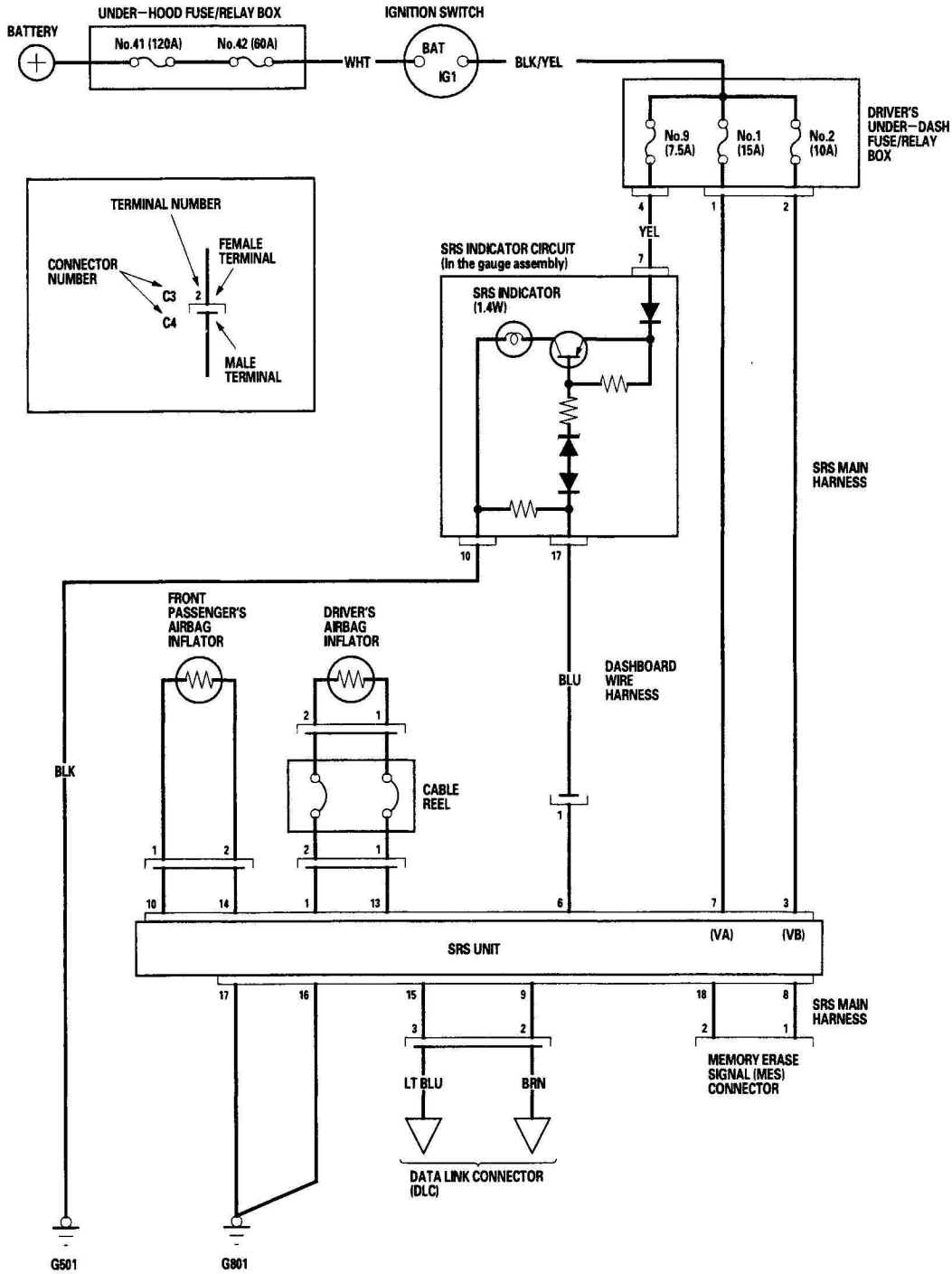
OnStar System
Whenever the front aibags deploy, the SRS unit signals the OnStar system to report the event to the call center.

BACK

Protected by AR

Circuit Diagram

'99 Model

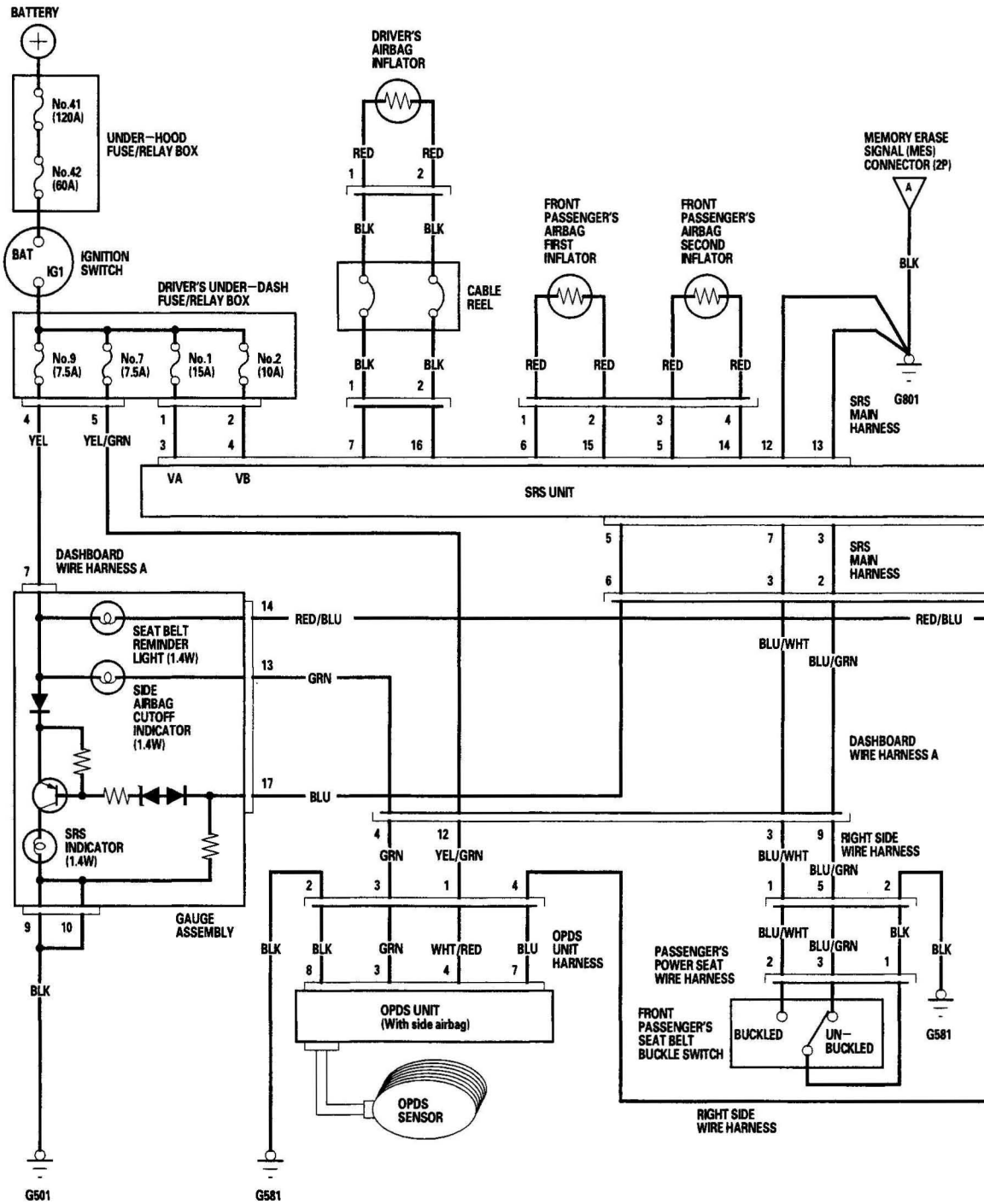


BACK

Protected by AR

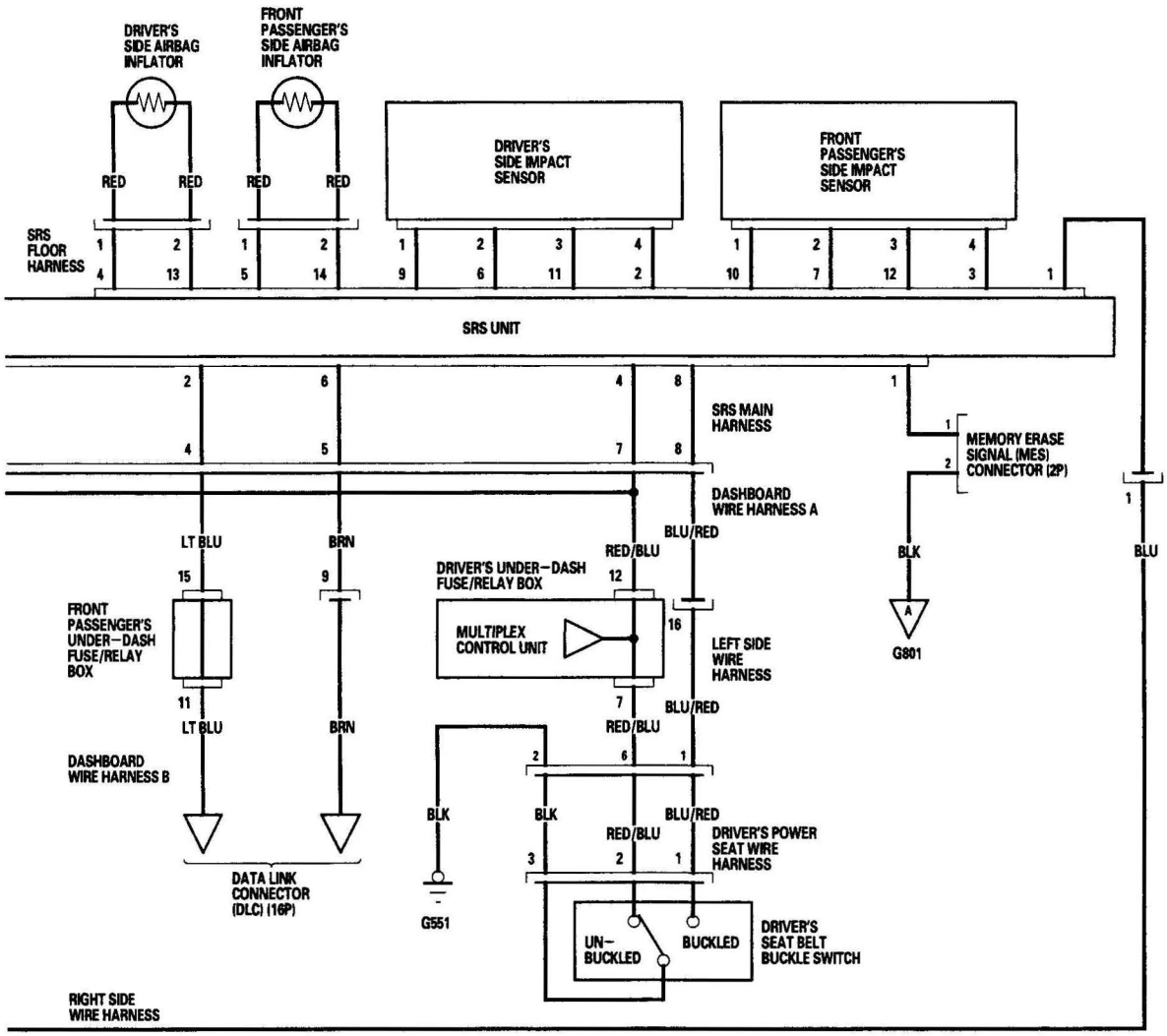
Circuit Diagram (cont'd)

'00-01 Models



BACK

Protected by AR

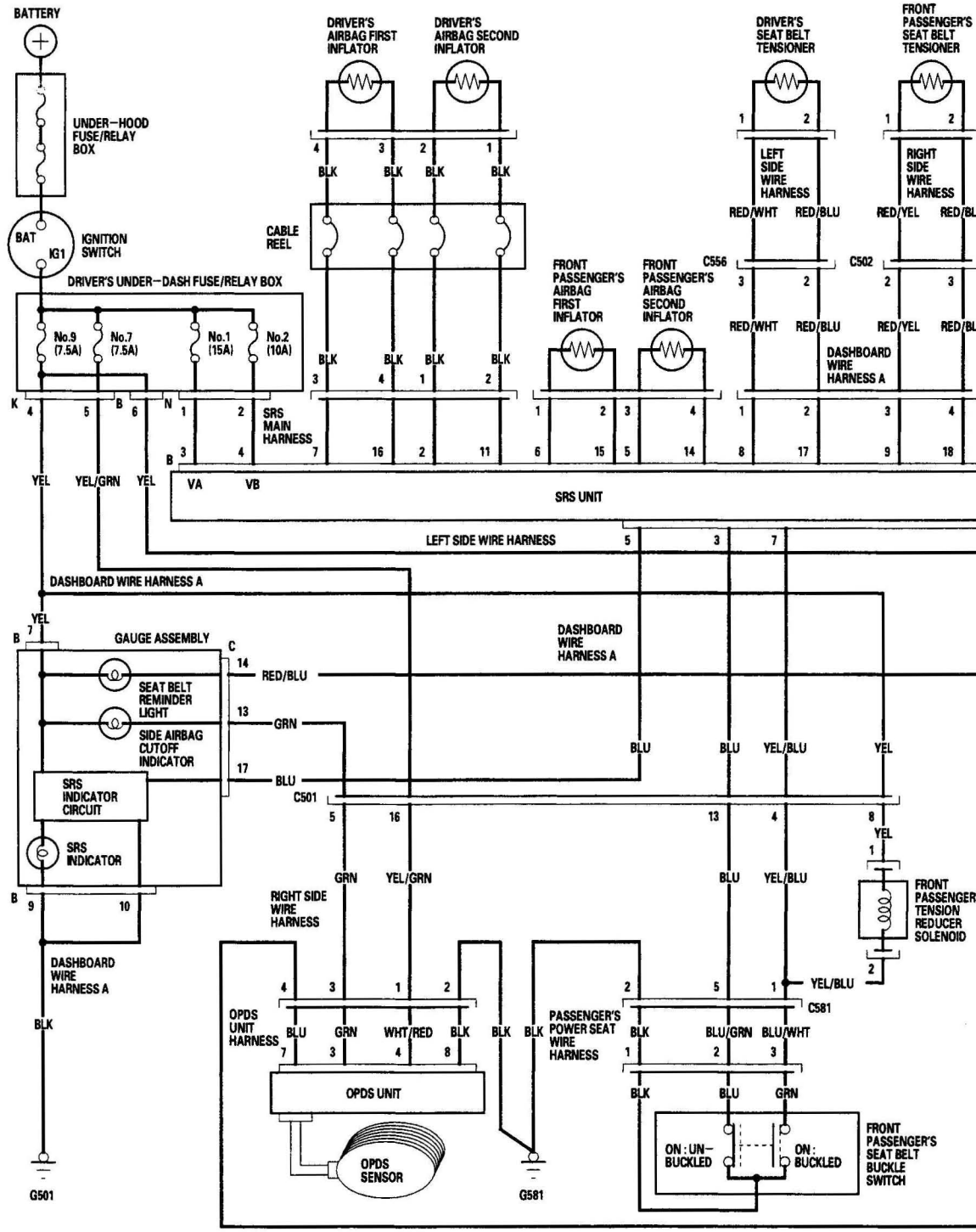


BACK

Protected by AR

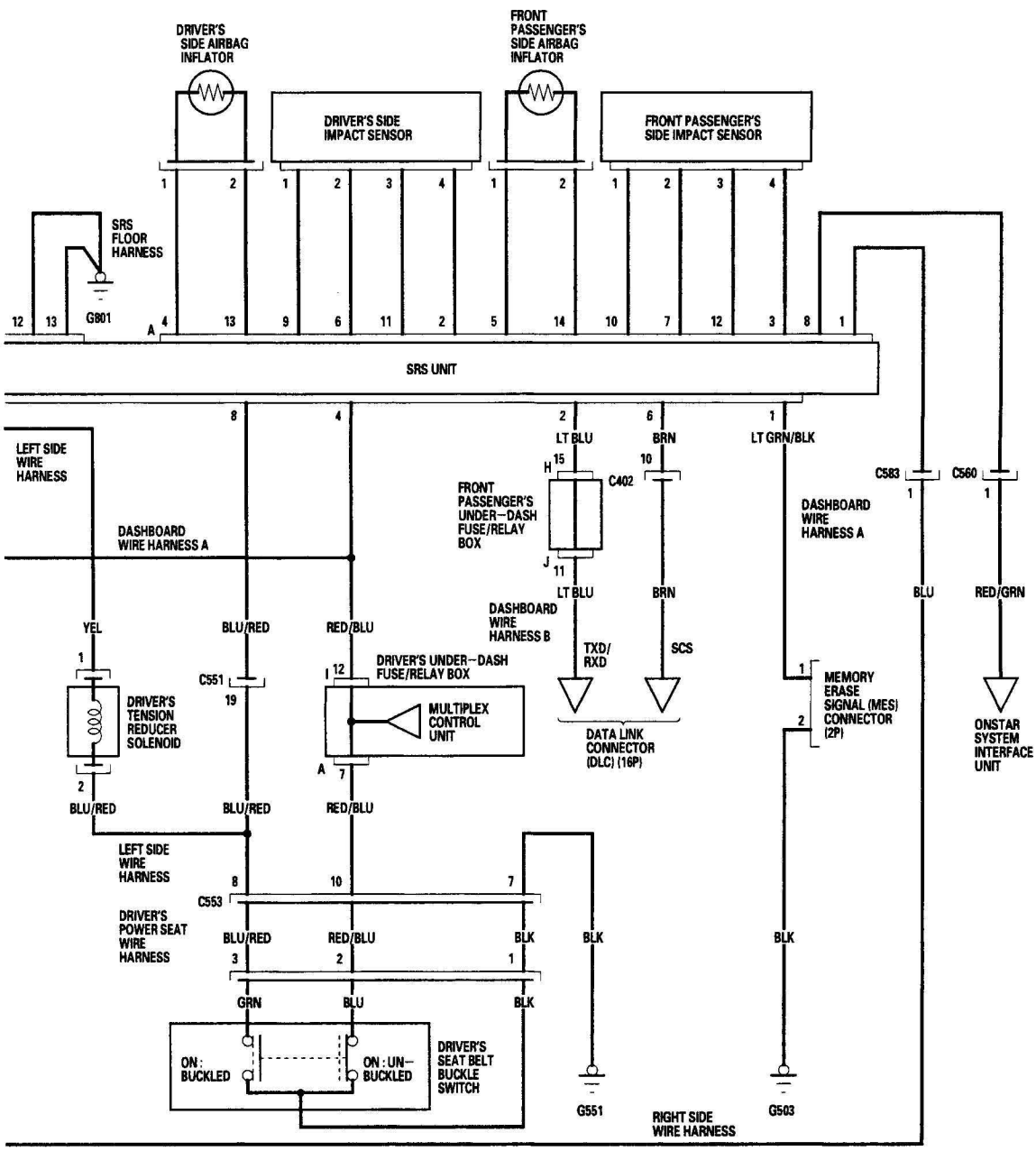
Circuit Diagram (cont'd)

'02-03 Models



BACK

Protected by AR



BACK

Protected by AR

DTC Troubleshooting

'99 Model

DTC 1-1: Open in driver's airbag inflator

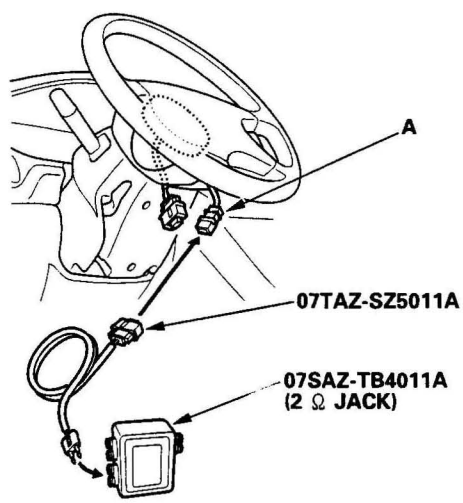
DTC 1-2: Increased resistance in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

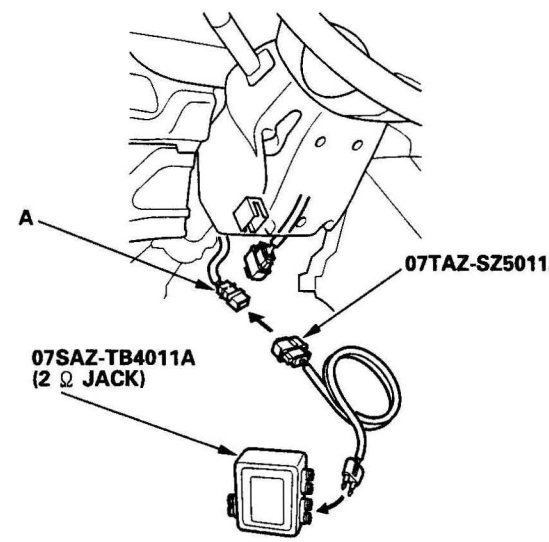


5. Connect the special tool (2 Ω) to the cable reel connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-1 or DTC 1-2 indicated?

   YES—Go to step 9.

   NO—Open or increased resistance in the driver's airbag inflator; replace the driver's airbag (see page 23-219).■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait 3 minutes.
10. Disconnect the cable reel 2P connector from the SRS main harness 2P connector (A).



11. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

BACK

Protected by AR

14. Read the DTC.

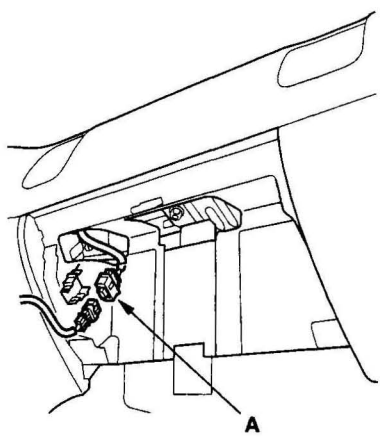
Is DTC 1-1 or DTC 1-2 indicated?

YES – Go to step 15.

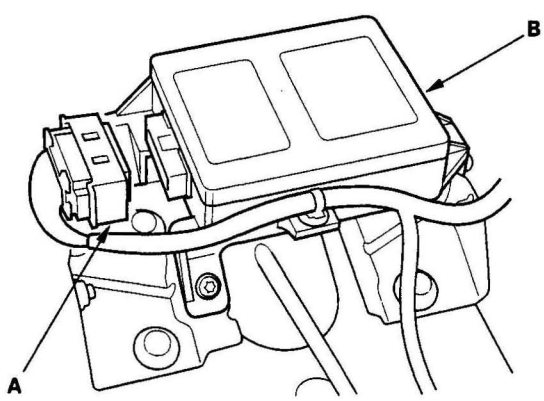
NO – Open or increased resistance in the cable reel; replace the cable reel (see page 23-231).

15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 2P connector (A).

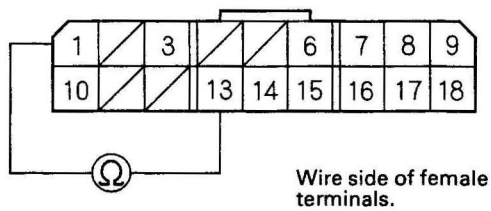


17. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



18. Check resistance between the No. 1 terminal and the No. 13 terminal of the SRS main harness 18P connector. There should be 2.0 – 3.0 Ω.

SRS MAIN HARNESS 18P CONNECTOR



Is the resistance as specified?

YES – Faulty SRS unit or poor contact at the SRS main harness 18P connector and the SRS unit. Check the connection between the SRS main harness 18P connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-237). ■

NO – Open or increased resistance in the SRS main harness; replace the SRS main harness. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'99 Model

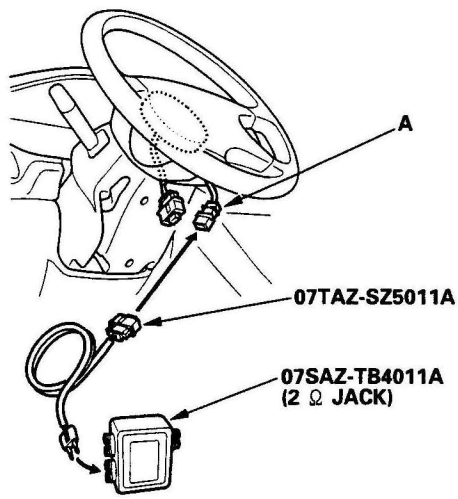
DTC 1-3: Short to another wire or decreased resistance in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

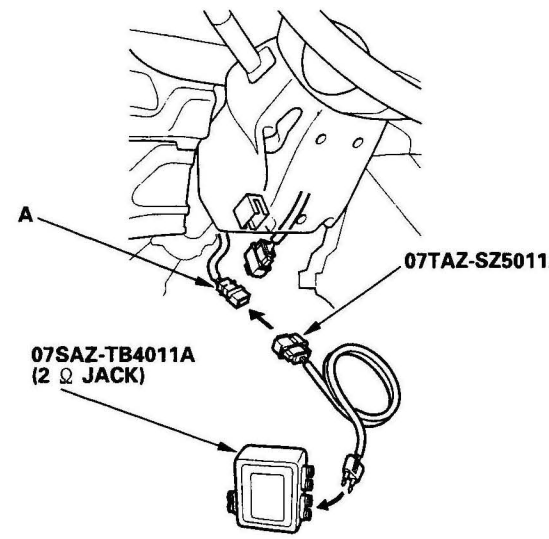


5. Connect the special tool (2 Ω) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-3 indicated?

   YES—Go to step 9.

   NO—Short in the driver's airbag; replace the driver's airbag (see page 23-219).■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait 3 minutes.
10. Disconnect the cable reel 2P connector from the SRS main harness 2P connector (A).



11. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 1-3 indicated?

    YES—Go to step 15.

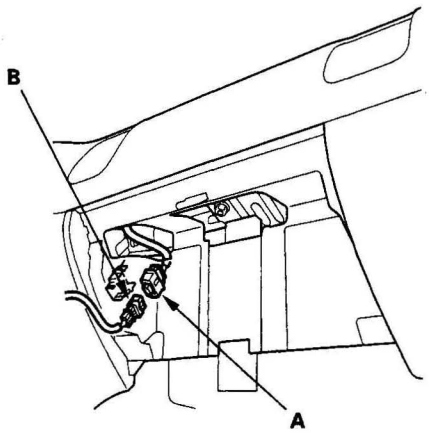
    NO—Short in the cable reel; replace the cable reel (see page 23-231).■

BACK

Protected by AR

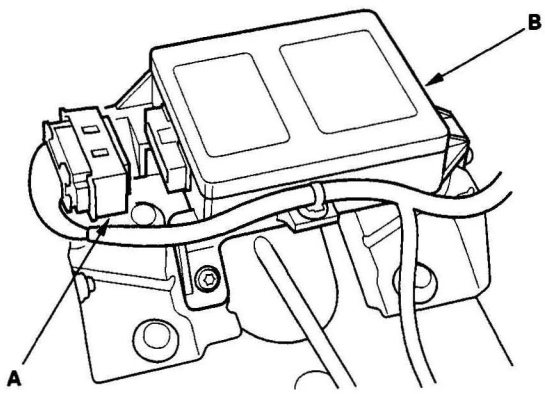
15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 2P connector (A) from the SRS main harness 2P connector (B).



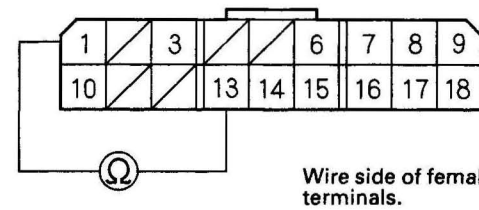
17. Disconnect the special tool (2 Ω) from the SRS main harness 2P connector.

18. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



19. Check resistance between the No. 1 terminal and the No. 13 terminal of the SRS main harness 18P connector. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES — Faulty SRS unit; replace the SRS unit (see page 23-237).■

NO — Short in the SRS main harness; replace the SRS main harness.■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'99 Model

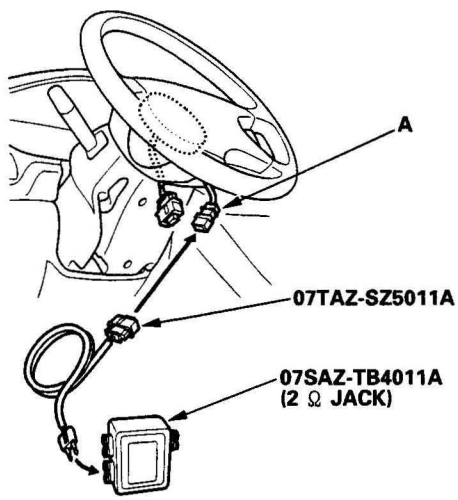
DTC 1-4: Short to power in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

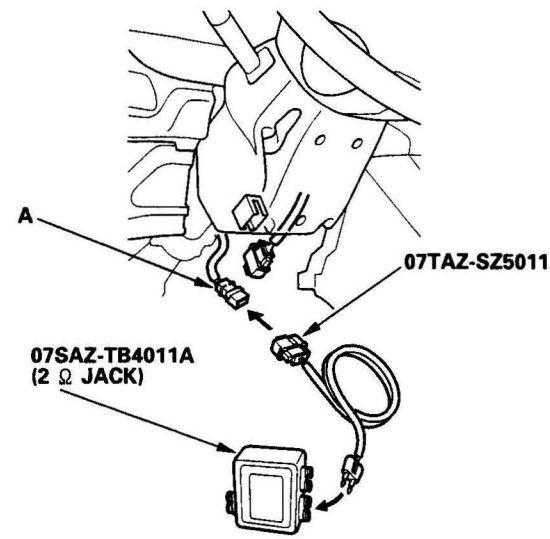


5. Connect the special tool (2 Ω) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the driver's airbag; replace the driver's airbag (see page 23-219).
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait 3 minutes.
10. Disconnect the cable reel 2P connector from the SRS main harness 2P connector (A).



11. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

BACK

Protected by AR

14. Read the DTC.

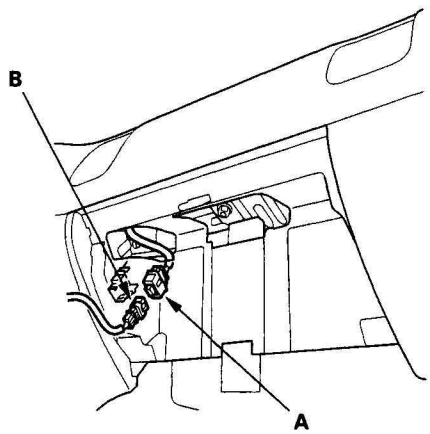
    Is DTC 1-4 indicated?

    YES – Go to step 15.

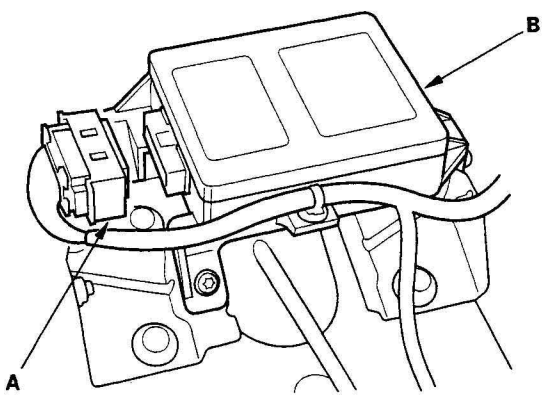
    NO – Short to power in the cable reel; replace the cable reel (see page 23-231). ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 2P connector (A) from the SRS main harness 2P connector (B).



17. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).

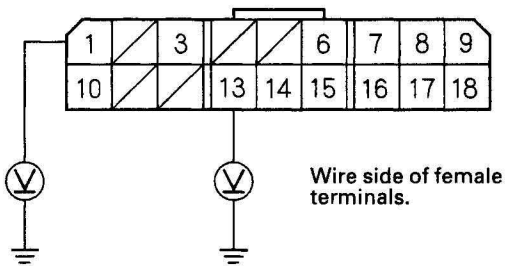


18. Reconnect the battery negative cable.

19. Turn the ignition switch ON (II).

20. Check for voltage between the No. 1 terminal of the SRS main harness 18P connector and body ground, and the No. 13 terminal and body ground. There should be 0.5 V or less.

SRS MAIN HARNESS 18P CONNECTOR



Is the voltage as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO – Short to power in the SRS main harness; replace the SRS main harness. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'99 Model

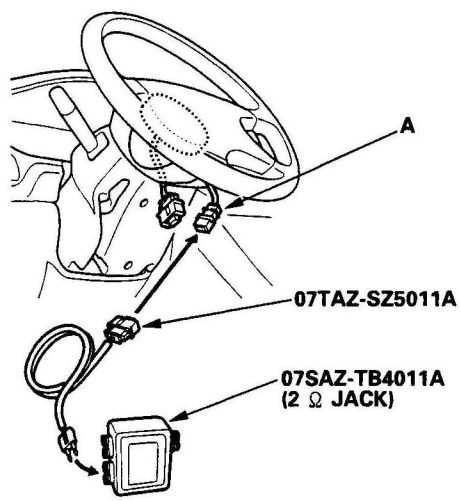
DTC 1-5: Short to ground in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

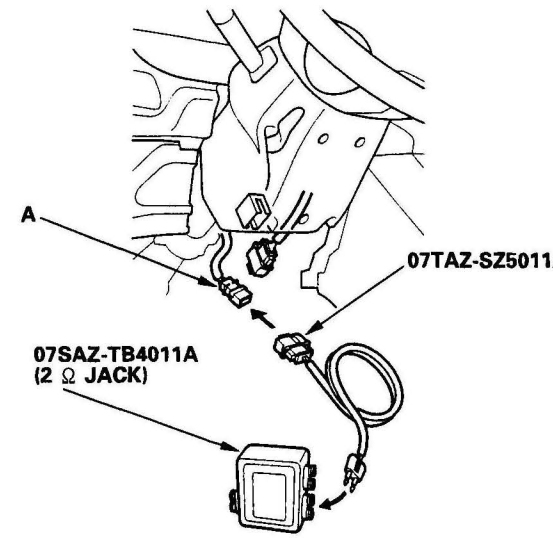


5. Connect the special tool (2 Ω) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-5 indicated?

   YES – Go to step 9.

   NO – Short to ground in the driver's airbag inflator; replace the driver's airbag (see page 23-219). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait 3 minutes.
10. Disconnect the SRS main harness 2P connector from the cable reel 2P connector (A).



11. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

BACK

Protected by AR

14. Read the DTC.

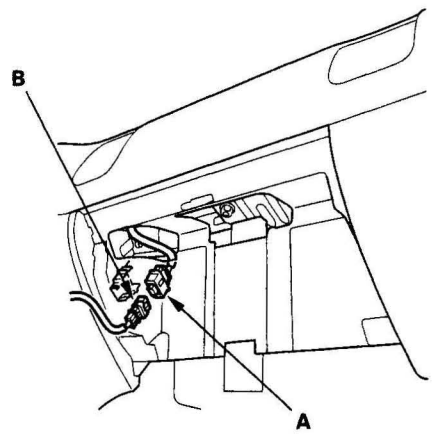
Is DTC 1-5 indicated?

YES – Go to step 15.

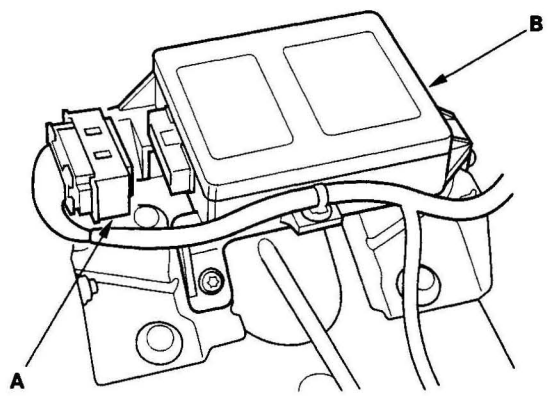
NO – Short to ground in the cable reel; replace the cable reel (see page 23-231). ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 2P connector (A) from the SRS main harness 2P connector (B).

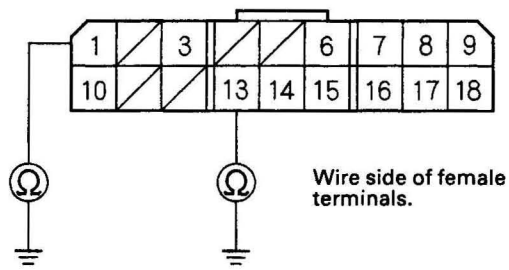


17. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



18. Check resistance between the No. 1 terminal of the SRS main harness 18P connector and body ground, and the No. 13 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 18P CONNECTOR



Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO – Short to ground in the SRS main harness; replace the SRS main harness. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'99 Model

DTC 2-1: Open in passenger's airbag inflator

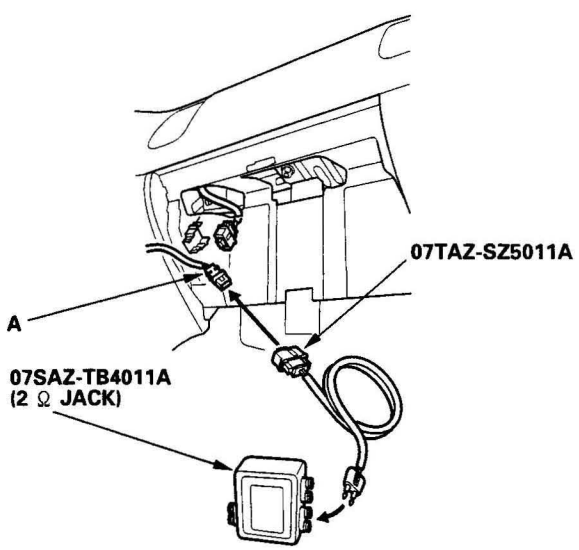
DTC 2-2: Increased resistance in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 2P connector from the SRS main harness 2P connector (A).

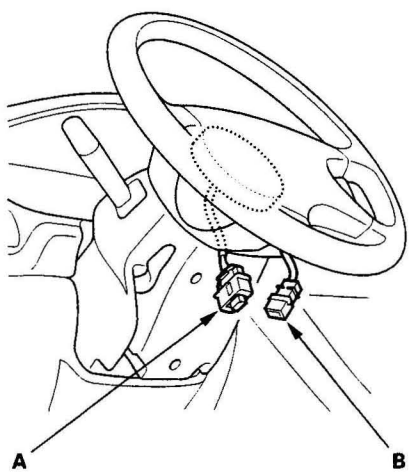


5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-1 or 2-2 indicated?

   YES – Go to step 9.

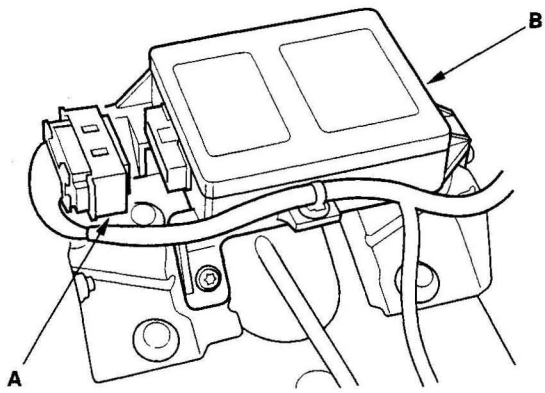
   NO – Open or increased resistance in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-221). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B).



BACK

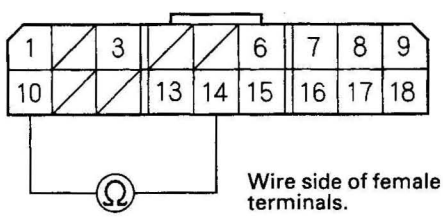
Protected by AR

11. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



12. Check resistance between the No. 10 and No. 14 terminals of the SRS main harness 18P connector. There should be 2.0—3.0 Ω.

SRS MAIN HARNESS 18P CONNECTOR



Is the resistance as specified?

YES—Faulty SRS unit or poor contact at the SRS unit connector; check the connection between the SRS main harness 18P connector and the SRS unit. If the connector is OK, replace the SRS unit (see page 23-237).■

NO—Open or increased resistance in the SRS main harness; replace the SRS main harness.■

'99 Model

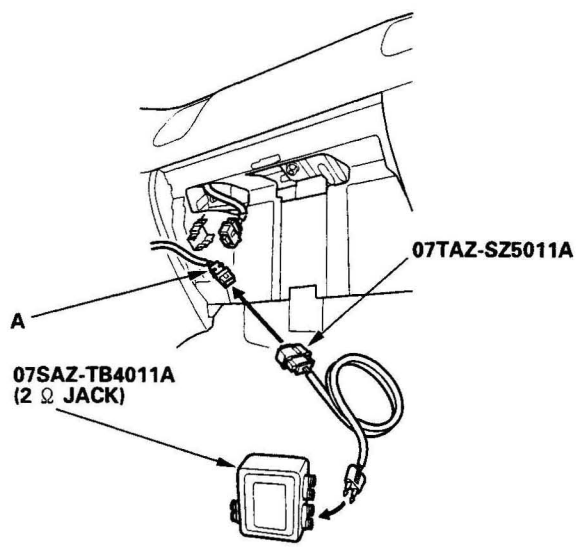
DTC 2-3: Short to another wire or decreased resistance in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 2P connector from the SRS main harness 2P connector (A).



5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

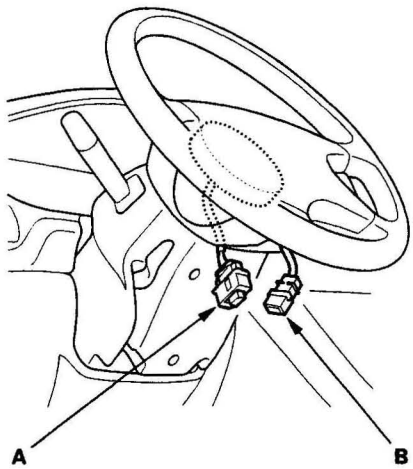
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-3 indicated?

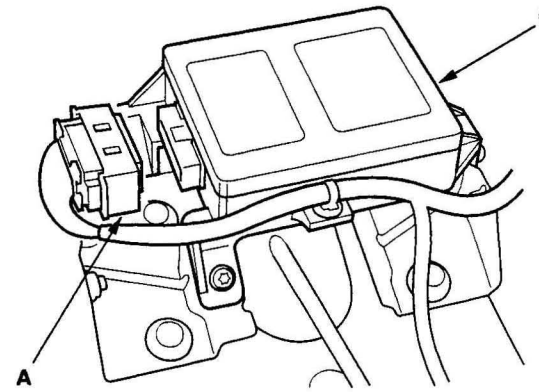
   YES – Go to step 9.

   NO – Short in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-221). ■

9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B).

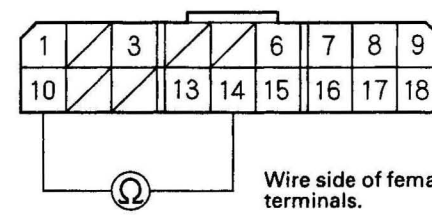


11. Disconnect the special tool (2 Ω) from the SRS main harness 2P connector.
12. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



13. Check resistance between the No. 10 and No. 14 terminals of the SRS main harness 18P connector. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 18P CONNECTOR



Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO – Short in the SRS main harness; replace the SRS main harness. ■

BACK

Protected by AR

'99 Model

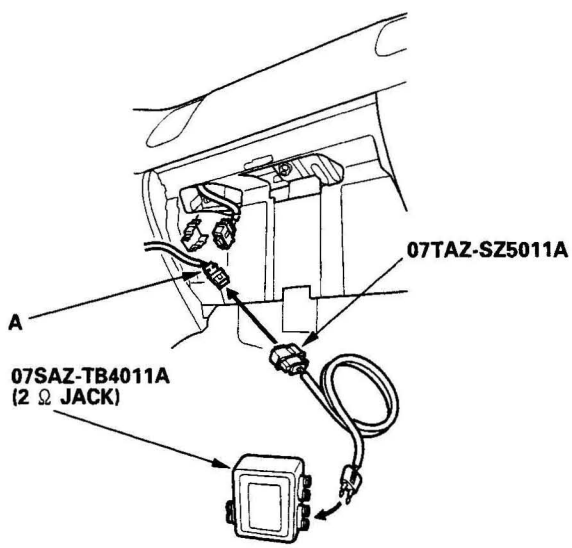
DTC 2-4: Short to power in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 2P connector from the SRS main harness 2P connector (A).

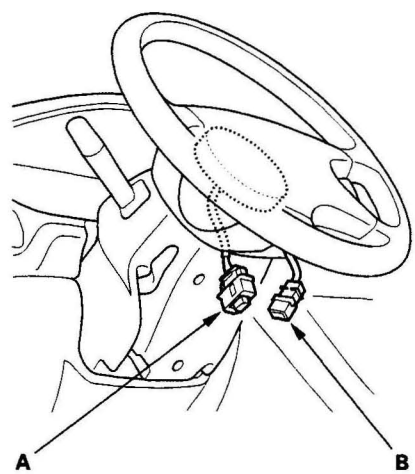


5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-221).
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B), and disconnect the special tool (2 Ω) from the SRS main harness 2P connector.



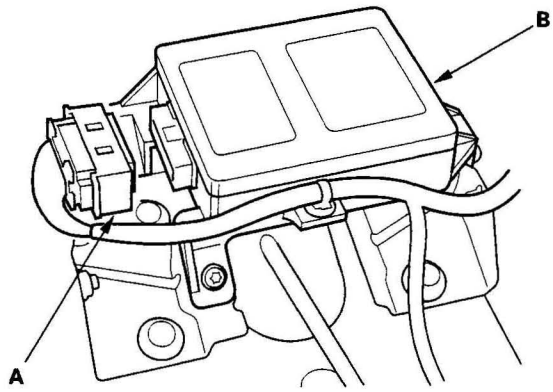
(cont'd)

BACK

Protected by AR

DTC Troubleshooting (cont'd)

11. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).

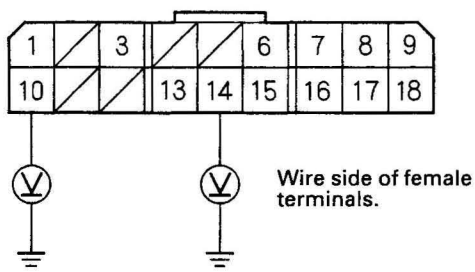


12. Reconnect the battery negative cable.

13. Turn the ignition switch ON (II).

14. Check for voltage between the No. 10 terminal of the SRS main harness 18P connector and body ground, and the No. 14 terminal and body ground. There should be 0.5 V or less.

SRS MAIN HARNESS 18P CONNECTOR



Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO—Short to power in the SRS main harness; replace the SRS main harness. ■

'99 Model

DTC 2-5: Short to ground in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

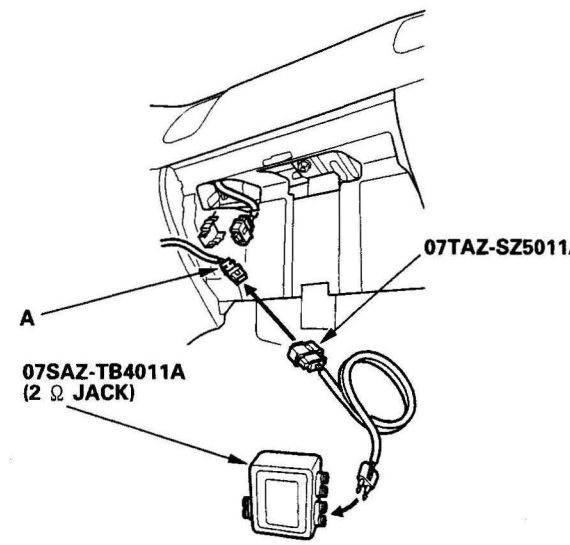
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

3. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's airbag 2P connector from the SRS main harness 2P connector (A).



5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.

BACK

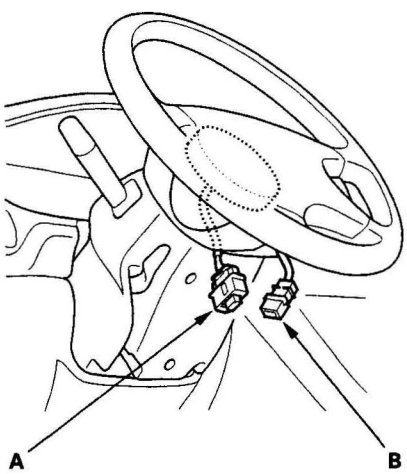
Protected by AR

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

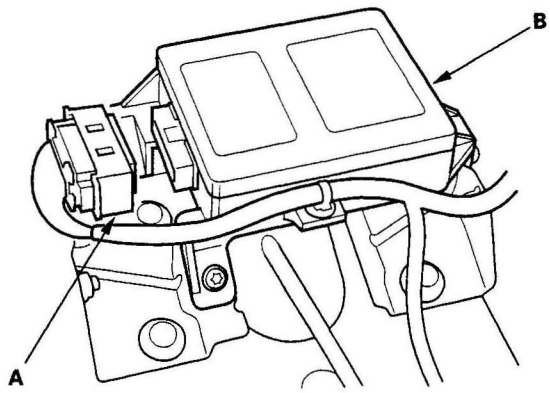
   Is DTC 2-5 indicated?

   YES—Go to step 9.

   NO—Short to ground in the passenger's airbag inflator; replace the passenger's airbag (see page 23-221).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B), and disconnect the special tool (2 Ω) from the SRS main harness 2P connector.

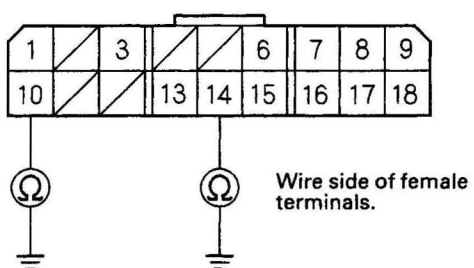


11. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



12. Check resistance between the No. 10 terminal of the SRS main harness 18P connector and body ground, and the No. 14 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 18P CONNECTOR



Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-237).■

NO—Short to ground in the SRS main harness; replace the SRS main harness.■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'99 Model

DTC 5-1 5-4, 6-1, 6-2, 6-3, 6-4, 7-1, 7-2, 7-3, 8-1, 8-2, 9-1, 9-2: Internal failure of the SRS unit

Note: Before troubleshooting any of these DTCs, check battery/system voltage. If voltage is low, repair the charging system before troubleshooting the SRS system. If the battery/system voltage are OK now, ask the customer if the battery ever went dead.

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Replace the SRS unit (see page 23-237).

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

'99 Model

DTC 10-1: Airbags deployed

The SRS unit must be replaced after airbags have deployed (see page 23-237).

BACK

Protected by AR

'99 Model

DTC 8-6: Internal failure of SRS unit, or two failures at a time

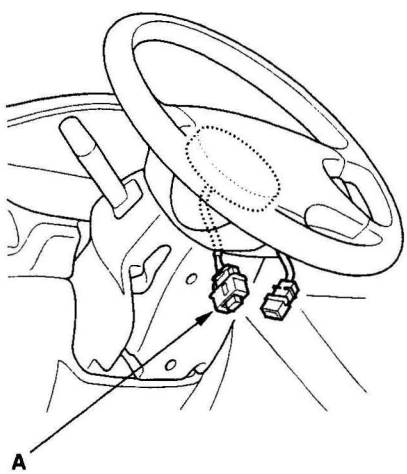
Besides indicating an abnormality in the SRS unit, DTC 8-6 may also indicate that two problems equivalent to DTC 1-1 and 2-4, 1-4 and 2-1, or 1-4 and 2-4 occurred at the same time. Proceed in the order shown below.

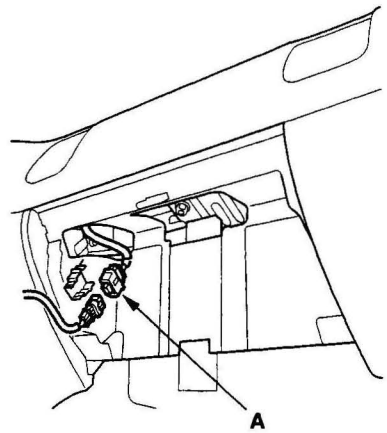
1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

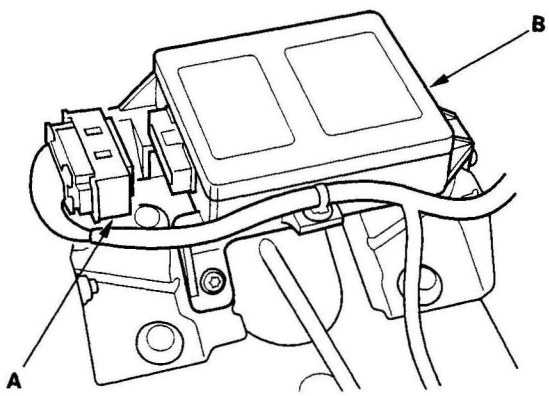
   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag and front passenger's airbag connectors (A).





5. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



6. Reconnect the battery negative cable.

(cont'd)

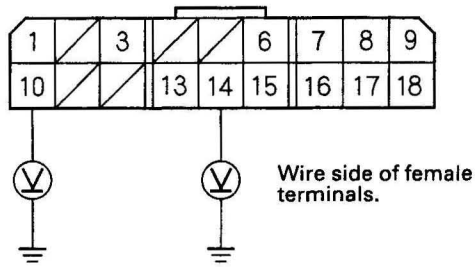
Protected by AR

DTC Troubleshooting (cont'd)

7. Turn the ignition switch ON(II).

8. Check for voltage between the No. 10 terminal of the SRS main harness 18P connector and body ground, and the No. 14 terminal and body ground. There should be 0.5 V or less.

SRS MAIN HARNESS 18P CONNECTOR



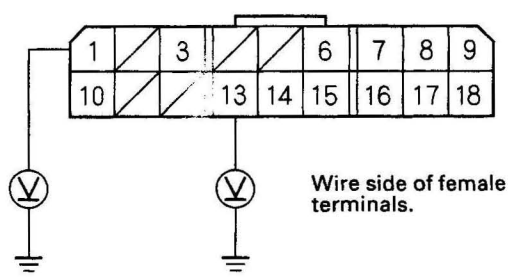
Are voltages as specified?

YES – Go to step 9.

NO – Short to power in the SRS main harness; replace the SRS main harness. ■

9. Check for voltage between the No. 1 terminal of the SRS main harness 18P connector and body ground, and the No. 13 terminal and body ground. There should be 0.5 V or less.

SRS MAIN HARNESS 18P CONNECTOR



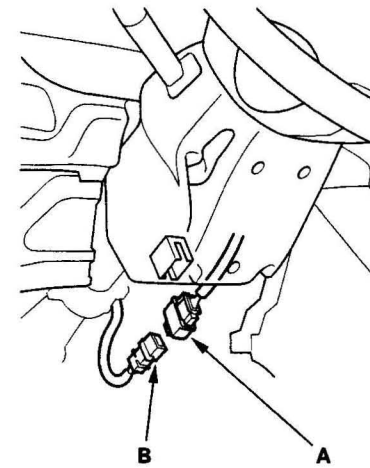
Are voltages as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO – Go to step 10.

10. Turn the ignition switch OFF.

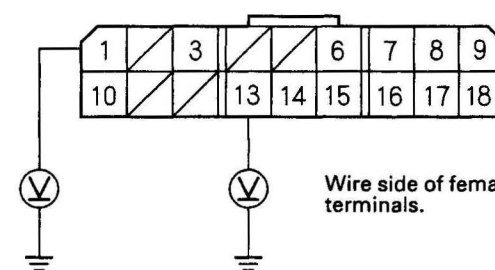
11. Disconnect the cable reel 2P connector (A) from the SRS main harness 2P connector (B).



12. Turn the ignition switch ON (II).

13. Check for voltage between the No. 1 terminal of the SRS main harness 18P connector and body ground, and the No. 13 terminal and body ground. There should be 0.5 V or less.

SRS MAIN HARNESS 18P CONNECTOR



Is the voltage as specified?

YES – Short to power in the cable reel; replace the cable reel (see page 23-231). ■

NO – Short to power in the SRS main harness; replace the SRS main harness. ■

BACK

Protected by AR

'00-01 Models

DTC 1-1: Open in driver's airbag inflator

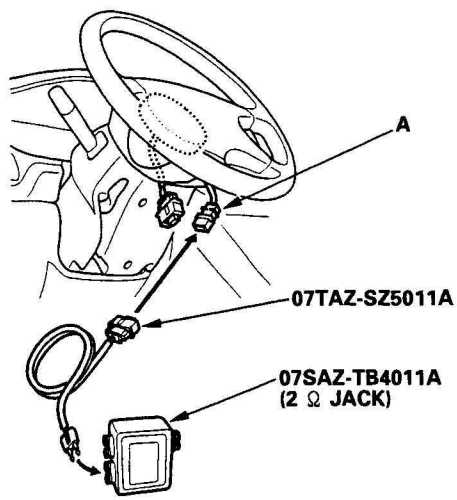
DTC 1-2: Increased resistance in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

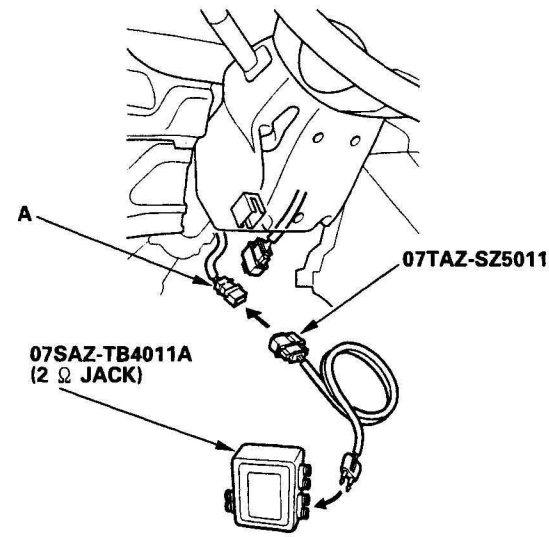


5. Connect the special tool (2 Ω) to the cable reel connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-1 or DTC 1-2 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the driver's airbag inflator; replace the driver's airbag (see page 23-219). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait 3 minutes.
10. Disconnect the cable reel 2P connector from the SRS main harness 2P connector (A).



11. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

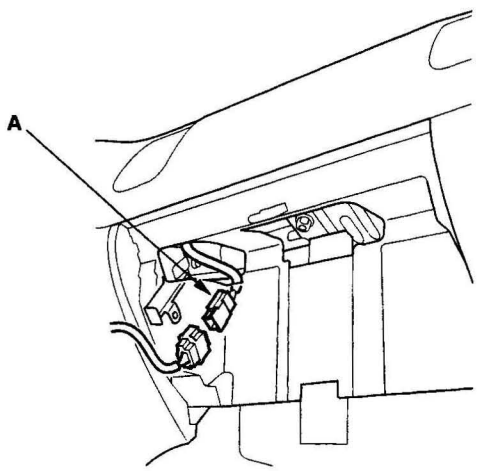
    Is DTC 1-1 or DTC 1-2 indicated?

    YES—Go to step 15.

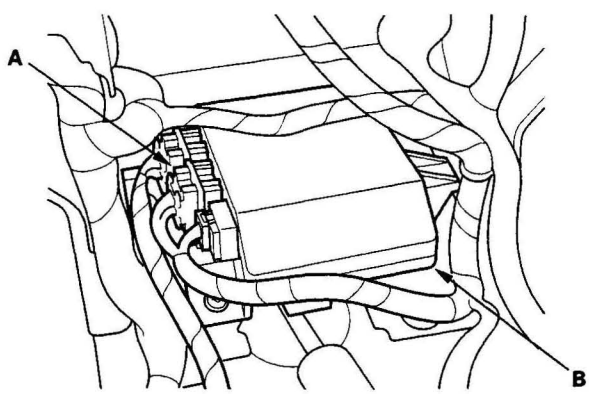
    NO—Open or increased resistance in the cable reel; replace the cable reel (see page 23-231).■

15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 4P connector (A).

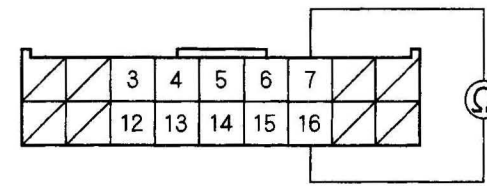


17. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



18. Check resistance between the No. 7 terminal and the No. 16 terminal of the SRS main harness 18P connector. There should be 2.0—3.0 Ω.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at the SRS main harness 18P connector and the SRS unit, check the connection between the SRS main harness 18P connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-237).■

NO—Open or increased resistance in the SRS main harness; replace the SRS main harness.■

BACK

Protected by AR

'00-01 Models

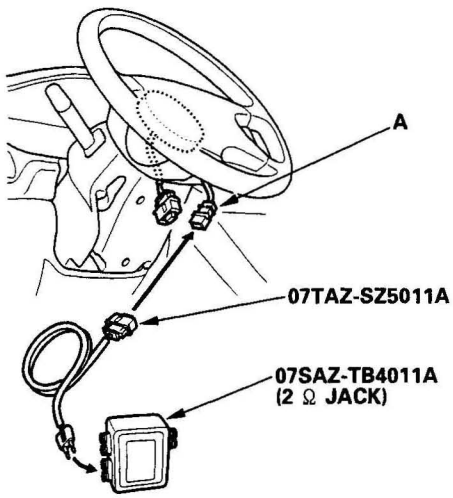
DTC 1-3: Short to another wire or decreased resistance in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

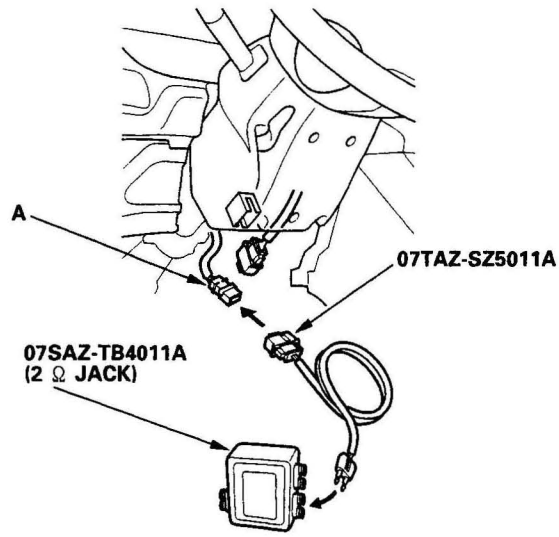


5. Connect the special tool (2 Ω) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-3 indicated?

   YES – Go to step 9.

   NO – Short in the driver's airbag; replace the driver's airbag (see page 23-219). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait 3 minutes.
10. Disconnect the cable reel 2P connector from the SRS main harness 2P connector (A).



11. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 1-3 indicated?

    YES – Go to step 15.

    NO – Short in the cable reel; replace the cable reel (see page 23-231). ■

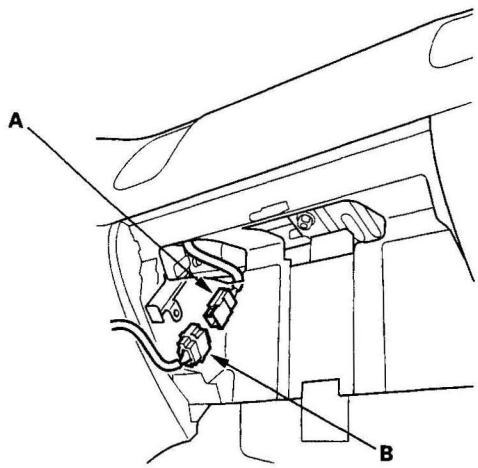
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

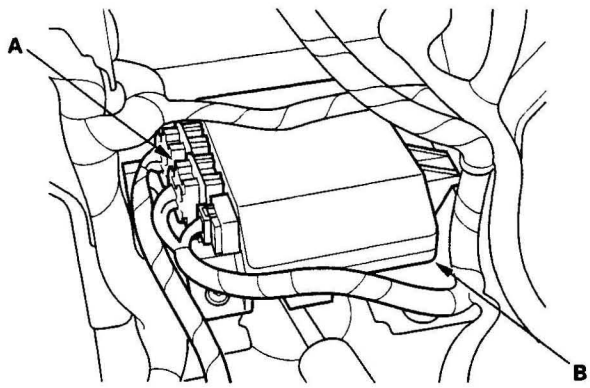
15. Disconnect the battery negative cable, and wait for three minutes.

16. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B).



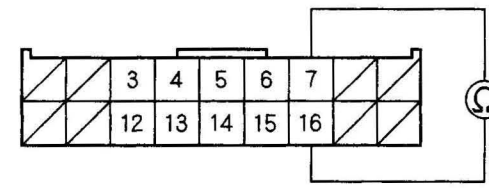
17. Disconnect the special tool (2 Ω) from the SRS main harness 2P connector.

18. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



19. Check resistance between the No. 7 terminal and the No. 16 terminal of the SRS main harness 18P connector. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO – Short in the SRS main harness; replace the SRS main harness. ■

BACK

Protected by AR

'00-01 Models

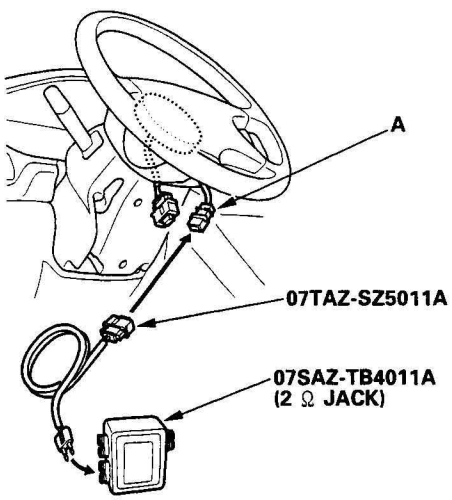
DTC 1-4: Short to power in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

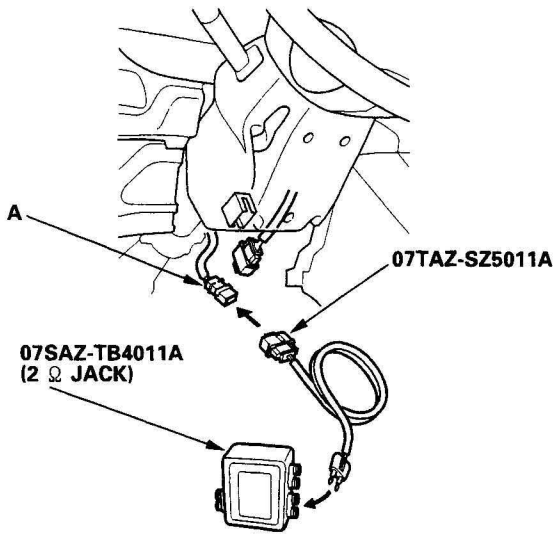


5. Connect the special tool (2 Ω) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the driver's airbag; replace the driver's airbag (see page 23-219).
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait 3 minutes.
10. Disconnect the cable reel 2P connector from the SRS main harness 2P connector (A).



11. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

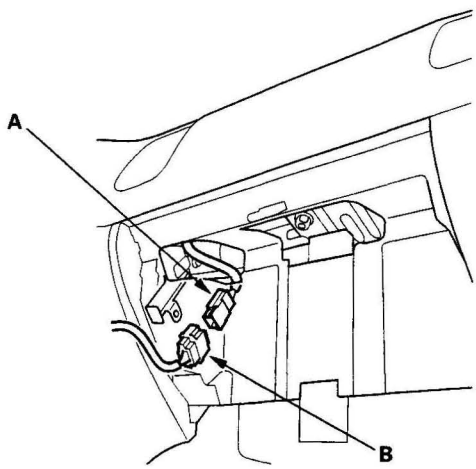
    Is DTC 1-4 indicated?

    YES—Go to step 15.

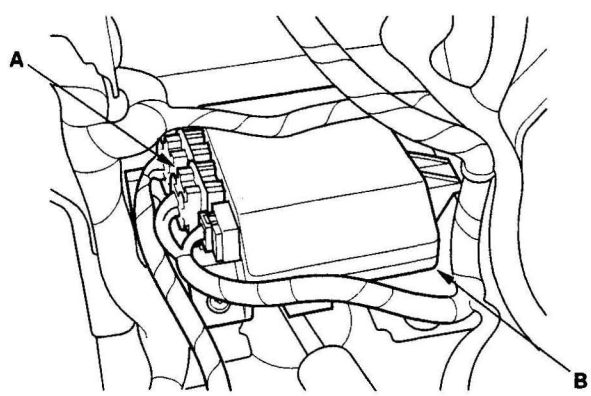
    NO—Short to power in the cable reel; replace the cable reel (see page 23-231).

15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B), and disconnect the special tool (2 Ω) from the SRS main harness 2P connector.



17. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).

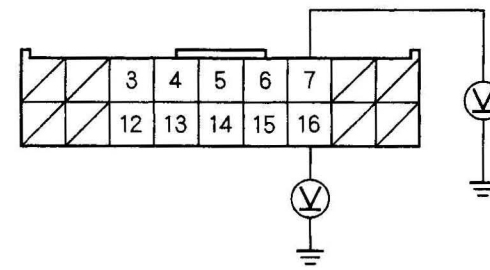


18. Reconnect the battery negative cable.

19. Turn the ignition switch ON (II).

20. Check for voltage between the No. 7 terminal of the SRS main harness 18P connector and body ground, and the No. 16 terminal and body ground. There should be 0.5 V or less.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-237).■

NO—Short to power in the SRS main harness; replace the SRS main harness.■

BACK

Protected by AR

'00-01 Models

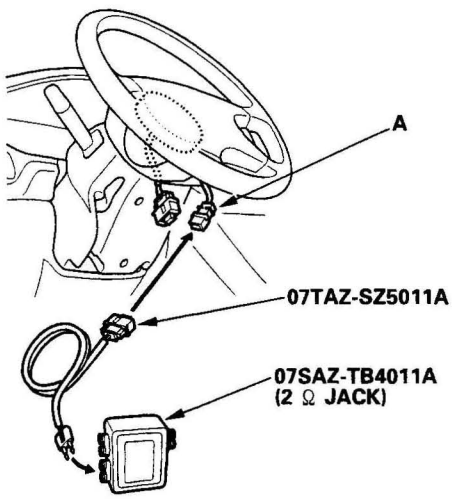
DTC 1-5: Short to ground in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).

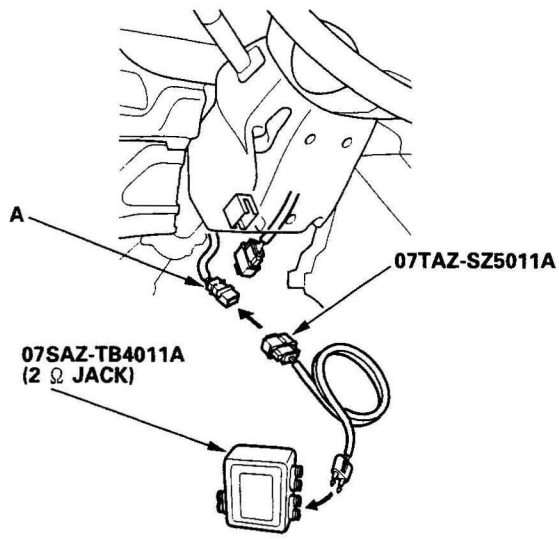


5. Connect the special tool (2 Ω) to the cable reel 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-5 indicated?

   YES – Go to step 9.

   NO – Short to ground in the driver's airbag inflator; replace the driver's airbag (see page 23-219). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait 3 minutes.
10. Disconnect the SRS main harness 2P connector from the cable reel 2P connector (A).



11. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

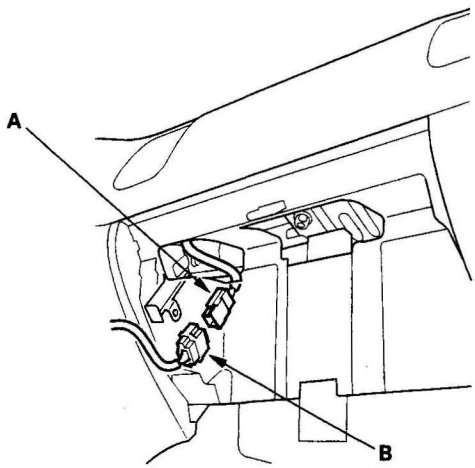
    Is DTC 1-5 indicated?

    YES – Go to step 15.

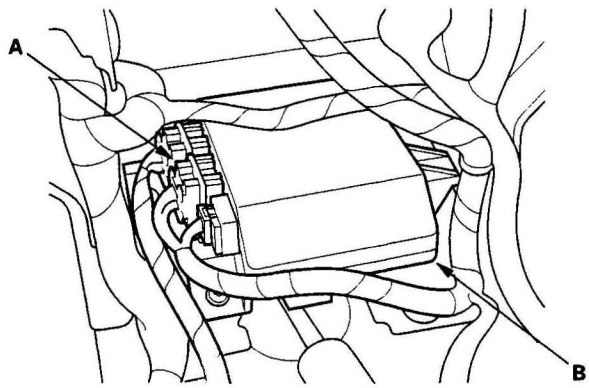
    NO – Short to ground in the cable reel; replace the cable reel (see page 23-231). ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B), and disconnect the special tool (2 Ω) from the SRS main harness 2P connector.

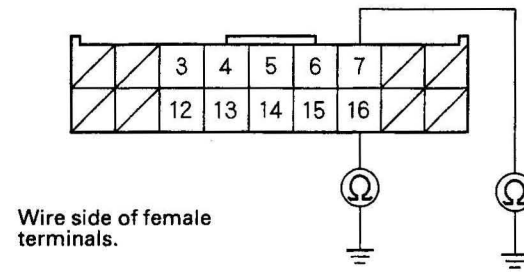


17. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



18. Check resistance between the No. 7 terminal of the SRS main harness 18P connector and body ground, and the No. 16 terminal and body body ground. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO – Short to ground in the SRS main harness; replace the SRS main harness. ■

BACK

Protected by AR

'00-01 Models

DTC 2-1: Open in passenger's airbag inflator

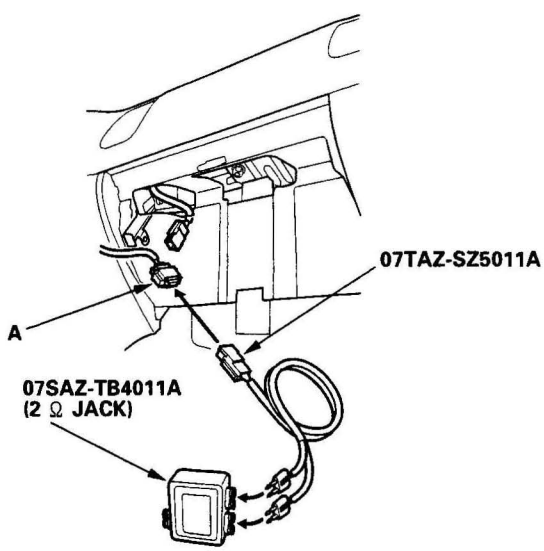
DTC 2-2: Increased resistance in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).

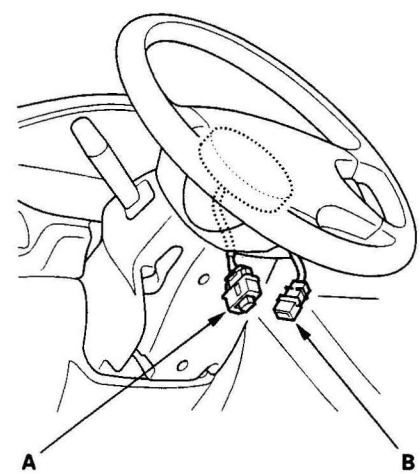


5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-1 or 2-2 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-221). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B).

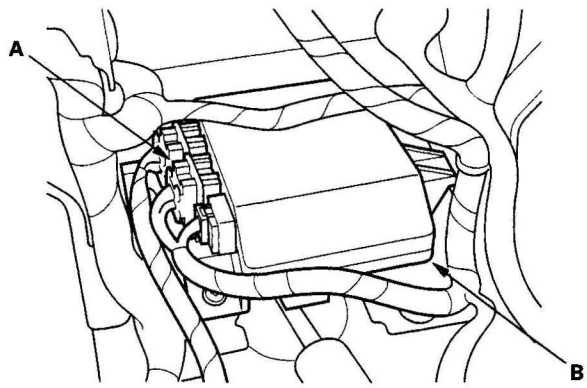


(cont'd)

Protected by AR

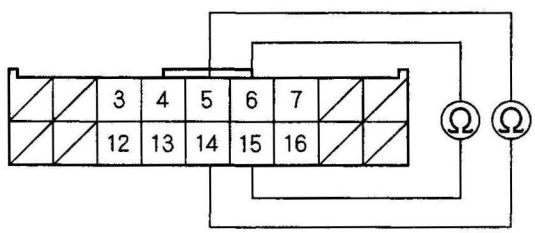
DTC Troubleshooting (cont'd)

11. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



12. Check resistance between the No. 6 and No. 15 terminals and between the No. 5 and No. 14 terminals of the SRS main harness 18P connector. There should be 2.0—3.0 Ω.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at the SRS unit connector; check the connection between the SRS main harness 18P connector and the SRS unit. If the connector is OK, replace the SRS unit (see page 23-237).■

NO—Open or increased resistance in the SRS main harness; replace the SRS main harness.■

'00-01 Models

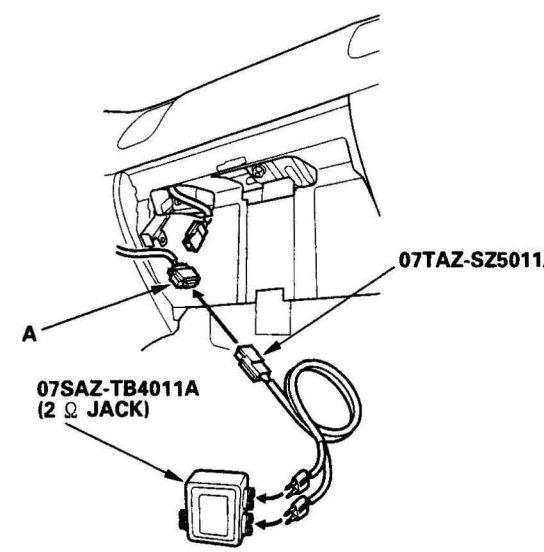
DTC 2-3: Short to another wire or decreased resistance in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).



5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.

BACK

Protected by AR

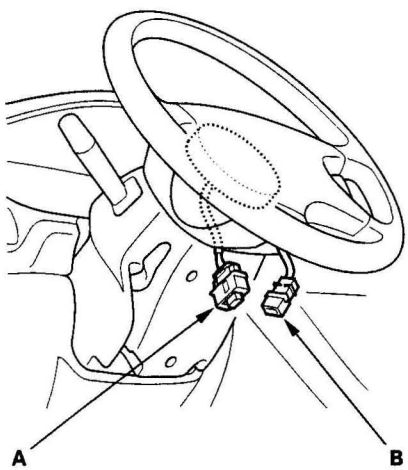
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-3 indicated?

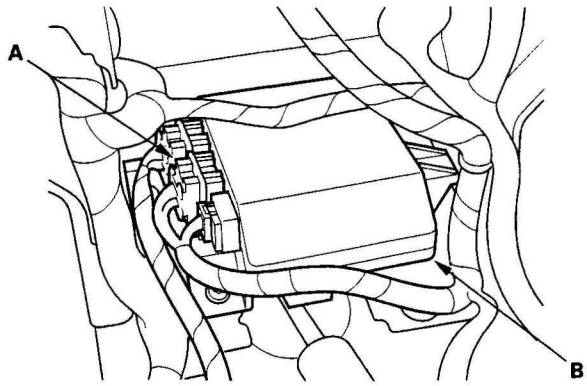
   YES—Go to step 9.

   NO—Short in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-221).■

9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B).

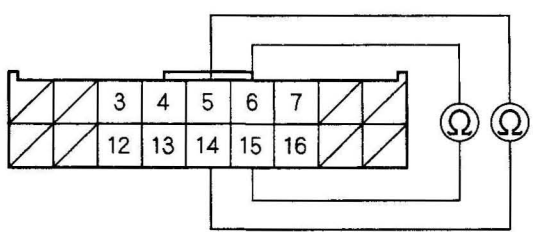


11. Disconnect the special tool (2 Ω) from the SRS main harness 2P connector.
12. Disconnect theSRS main harness 18P connector (A) from the SRS unit (B).



13. Check resistance between the No. 6 and No. 15 terminals and between the No. 5 and No. 14 terminals of the SRS main harness 18P connector. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-237).■

NO—Short in the SRS main harness; replace the SRS main harness.■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'00-01 Models

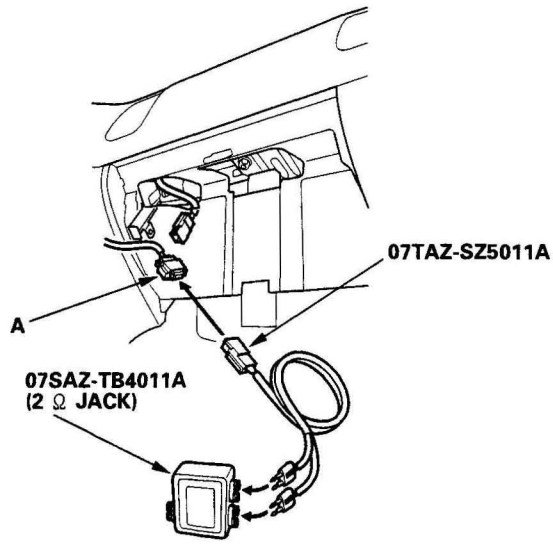
DTC 2-4: Short to power in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).

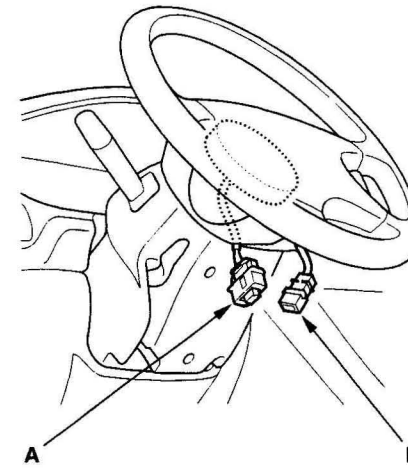


5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-4 indicated?

   YES – Go to step 9.

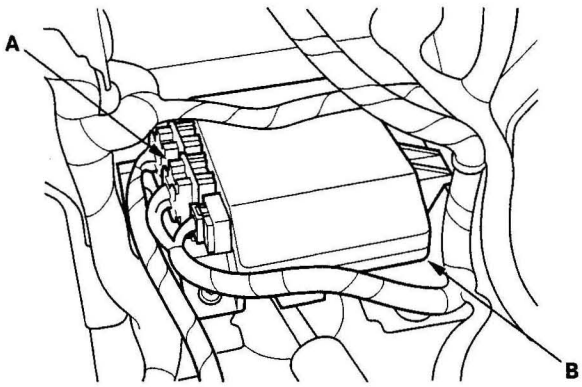
   NO – Short to power in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-221).
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B), and disconnect the special tool (2 Ω) from the SRS main harness 4P connector.



BACK

Protected by AR

11. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).

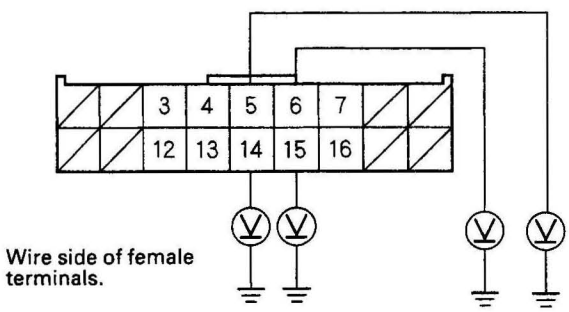


12. Reconnect the battery negative cable.

13. Turn the ignition switch ON (II).

14. Check for voltage between the No. 6 terminal of the SRS main harness 18P connector and body ground, the No. 15 terminal and body ground, the No. 5 terminal and body ground, and the No. 14 terminal and body ground. There should be 0.5 V or less.

SRS MAIN HARNESS 18P CONNECTOR



Is the voltage as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO – Short to power in the SRS main harness; replace the SRS main harness. ■

'00-01 Models

DTC 2-5: Short to ground in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

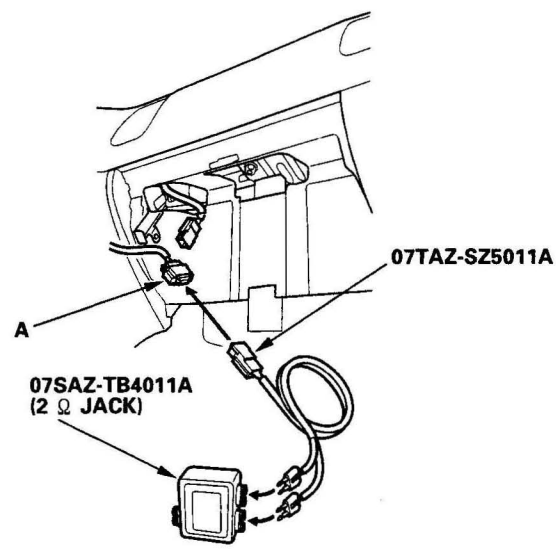
   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

3. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's airbag 2P connector from the SRS main harness 2P connector (A).



5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

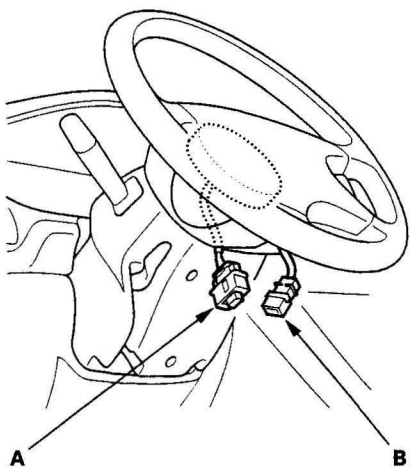
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-5 indicated?

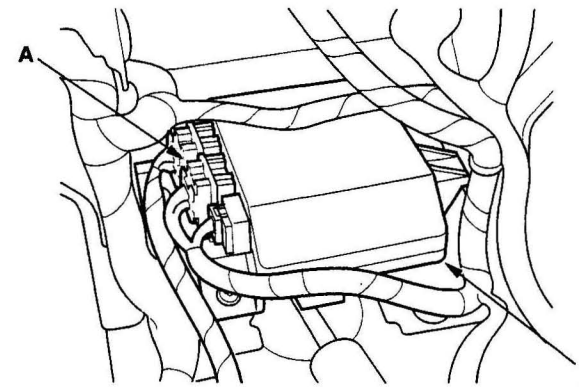
   YES – Go to step 9.

   NO – Short to ground in the passenger's airbag inflator; replace the passenger's airbag (see page 23-221).■

9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 2P connector (A) from the cable reel 2P connector (B), and disconnect the special tool (2 Ω) from the SRS main harness 2P connector.

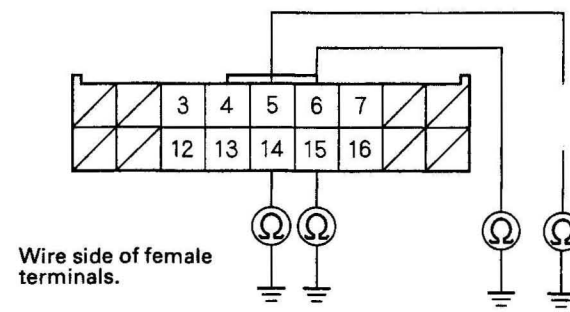


11. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



12. Check resistance between the No. 6 terminal of the SRS main harness 18P connector and body ground, the No. 15 terminal and body ground, the No. 5 terminal and body ground, and the No. 14 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 18P CONNECTOR



Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit (see page 23-237).■

NO – Short to ground in the SRS main harness; replace the SRS main harness.■

BACK

Protected by AR

'00-01 Models

DTC 5-1, 5-2, 5-4, 5-5, 5-8, 6-1, 6-2, 6-3, 6-4, 6-5, 6-6, 6-7, 6-8, 7-1, 7-2, 7-3, 8-1, 8-2, 8-5, 8-6, 8-7, 8-8, 9-1, 9-2, 13-5, 14-5 : Internal failure of the SRS unit

Note: Before troubleshooting any of these DTCs, check battery/system voltage. If voltage is low, repair the charging system before troubleshooting the SRS system. If the battery/system voltage are OK now, ask the customer if the battery ever went dead.

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Replace the SRS unit (see page 23-237).

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

'00-01 Models

DTC 10-1, 10-2, 10-3, 10-4, 10-5, 10-6, 10-7: Airbags and/or side airbags deployed

The SRS unit must be replaced after any airbags have deployed (see page 23-237).

Protected by AR

DTC Troubleshooting (cont'd)

'00-01 Models

DTC 13-4, 14-4: Faulty power supply to the side impact sensor

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Replace the SRS floor harness. ■

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

BACK

Protected by AR

'00-01 Models

DTC 9-3: Faulty driver's seat belt buckle switch

1. Check the connections at the driver's seat belt buckle switch 3P and driver's power seat wire harness 10P connectors, at the driver's power seat wire harness 10P and left side wire harness 10P connectors, at the left side wire harness 10P and driver's under-dash fuse/relay box 10P connectors, at the driver's under-dash fuse/relay box 18P and dashboard wire harness A 18P connectors, at the left side wire harness 18P and dashboard wire harness A 18P connectors, at the dashboard wire harness A 8P and SRS main harness 8P connectors and at the dashboard wire harness A 8P and SRS unit 8P connectors.

   Are the connections ok?

   YES – Go to step 2.

   NO – Poor contact; reconnect the affected connector(s) securely. ■

2. Check that the driver's seat belt is unbuckled.

3. Turn the ignition switch ON (II), and check that the seat belt reminder light comes on.

   Does the seat belt reminder light come on?

   YES – Go to step 8.

   NO – Go to step 4.

4. Turn the ignition switch OFF.

5. Turn the ignition switch ON (II), and check to see if the other indicator lights come on (SRS indicator, etc.)

   Do the other indicator lights come on?

   YES – Blown seat belt reminder light bulb or open in the wire between the gauge assembly and body ground; check the seat belt reminder light bulb. If the bulb is OK, refer to section 22 and continue troubleshooting. ■

   NO – Go to step 6.

6. Turn the ignition switch OFF.

7. Check the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Open in dashboard wire harness A; refer to section 22 and continue troubleshooting. ■

   NO – Short to ground in the No. 9 (7.5 A) fuse circuit; refer to section 22 and continue troubleshooting. ■

8. Buckle the driver's seat belt, and check that the seat belt reminder light goes off.

   Does the seat belt reminder light go off?

   YES – Go to step 9.

   NO – Short to ground or short to another wire between the gauge assembly and the driver's seat belt buckle switch; Refer section 22 and continue troubleshooting. ■

(cont'd)

BACK

Protected by AR

DTC Troubleshooting (cont'd)

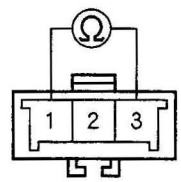
9. Turn the ignition switch OFF.
10. Unbuckle the driver's seat belt.
11. Erase the DTC memory.
12. Read the DTC.

    Is DTC 9-3 indicated?

    YES – Go to step 20.

    NO – Go to step 13.
13. Disconnect the battery negative cable.
14. Disconnect the driver's seat belt buckle switch 3P connector.
15. Check resistance between the No. 3 and No. 1 terminal of the driver's seat belt buckle switch 3P connector, with the seat belt buckled. There should be 0 – 1.0 Ω.

DRIVER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



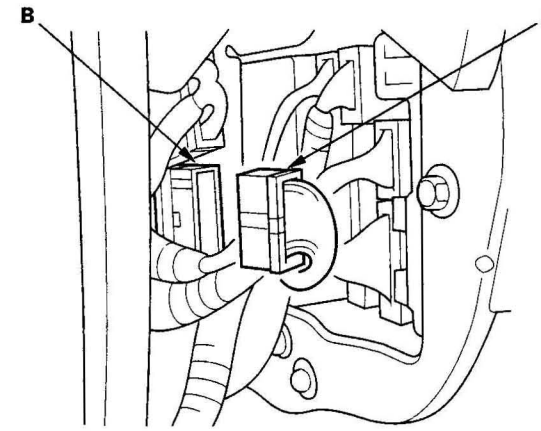
Terminal side of male terminals.

Is the resistance as specified?

YES – Go to step 16.

NO – Faulty driver's seat belt buckle switch; replace the driver's seat belt buckle. ■

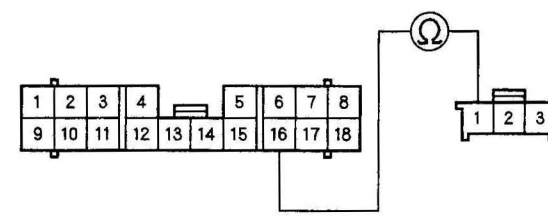
16. Disconnect the dashboard wire harness A 18P connector (A) from the left side wire harness 18P connector (B).



17. Check resistance between the No. 16 terminal of the left side wire harness 18P connector and the No. 1 terminal of the driver's power seat wire harness 3P connector. There should be 0 – 1.0 Ω.

LEFT SIDE WIRE HARNESS 18P CONNECTOR

LEFT SIDE WIRE HARNESS 3P CONNECTOR



Wire side of female terminals.

Wire side of female terminals.

Is the resistance as specified?

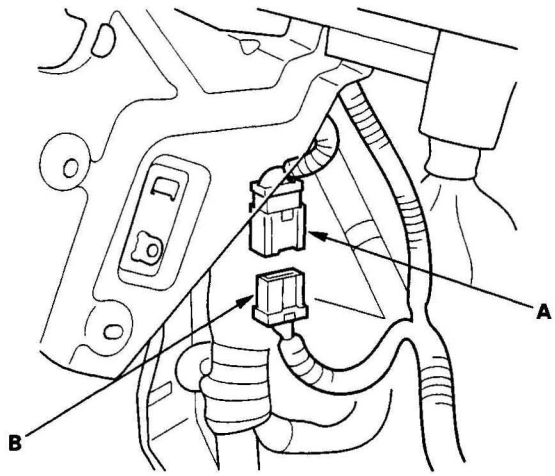
YES – Go to step 18.

NO – Open in the left side wire harness or in the driver's power seat wire harness; replace the faulty harness. ■

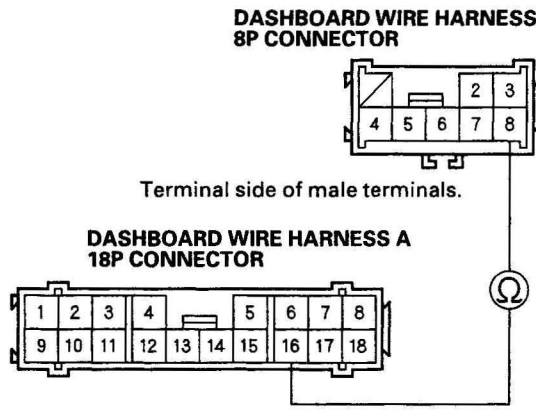
BACK

Protected by AR

18. Disconnect the dashboard wire harness A 8P connector (A) from the SRS main harness (B).



19. Check resistance between the No. 16 terminal of the dashboard wire harness A 18P connector and the No. 8 terminal of the dashboard wire harness A 8P connector. There should be 0 – 1.0 Ω.



Is the resistance as specified?

YES – Go to step 26.

NO – Open in dashboard wire harness A; replace dashboard wire harness A.■

(cont'd)

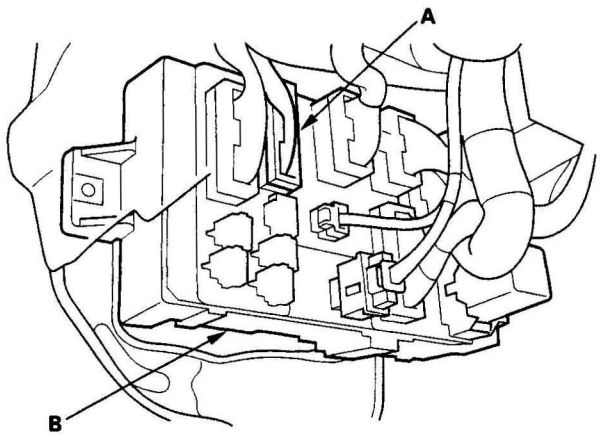
BACK

Protected by AR

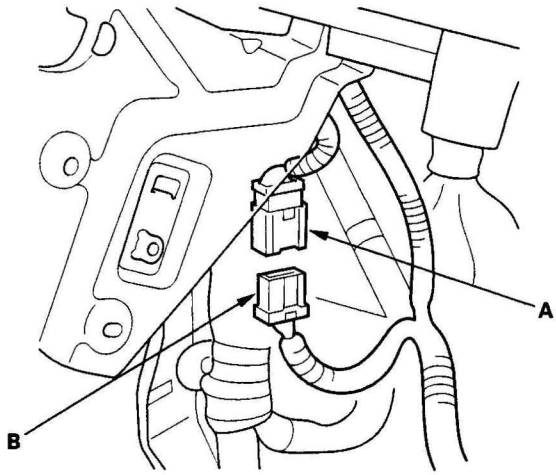
DTC Troubleshooting (cont'd)

20. Disconnect the battery negative cable.

21. Disconnect the dashboard wire harness A 18P connector (A) from the driver's under-dash fuse/ relay box (B).



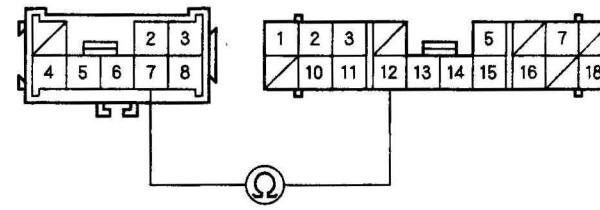
22. Disconnect the dashboard wire harness A 8P connector (A) from the SRS main harness (B).



23. Check resistance between the No. 7 terminal of the dashboard wire harness A 8P connector and the No. 12 terminal of the dashboard wire harness A 18P connector. There should be 0 – 1.0 Ω.

DASHBOARD WIRE HARNESS 8P CONNECTOR

DASHBOARD WIRE HARNESS 18P CONNECTOR



Terminal side of male terminals.

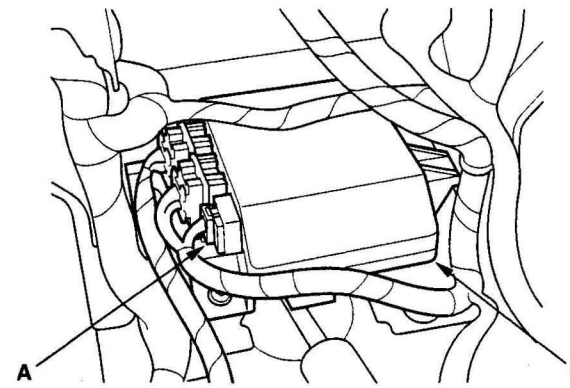
Wire side of female terminals.

Is the resistance as specified?

YES – Go to step 24.

NO – Open in the dashboard wire harness A; replace the dashboard wire harness A. ■

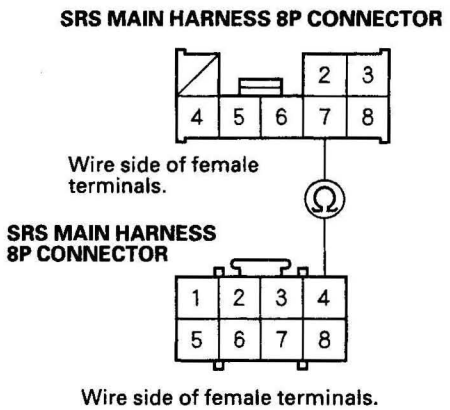
24. Disconnect the SRS main harness 8P connector (A) from the SRS unit (B).



BACK

Protected by AR

25. Check resistance between the No. 7 terminal of the SRS main harness 8P connector (dashboard wire harness A side) and the No. 4 terminal of the SRS main harness 8P connector (SRS unit side). There should be 0—1.0 Ω.

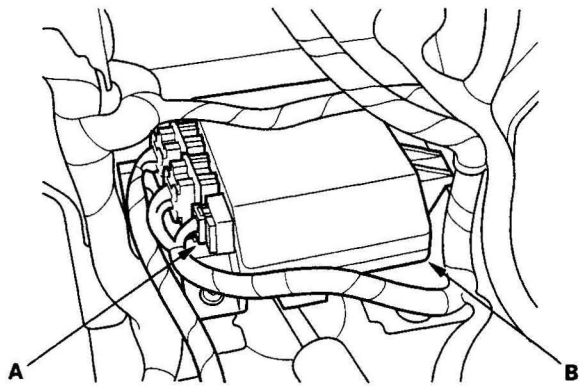


Is the resistance as specified?

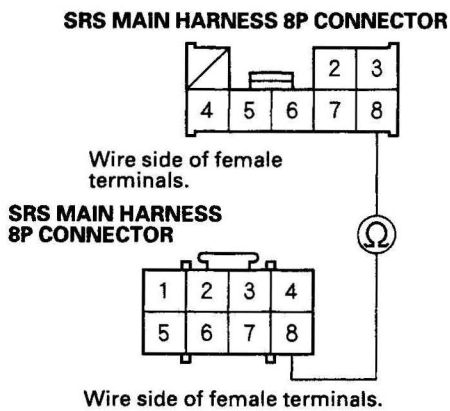
YES—Faulty SRS unit; replace the SRS unit.■

NO—Open in the SRS main harness; replace the SRS main harness.■

26. Disconnect the SRS main harness 8P connector (A) from the SRS unit (B).



27. Check resistance between the No. 8 terminal of the SRS main harness 8P connector (dashboard wire harness side) and the No. 8 terminal of the SRS main harness 8P connector (SRS unit side). There should be 0—1.0 Ω.



Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit.■

NO—Open in the SRS main harness; replace the SRS main harness.■

Protected by AR

DTC Troubleshooting (cont'd)

'00-01 Models

DTC 9-4: Faulty front passenger's seat belt buckle switch

1. Check the connections at the front seat belt buckle switch 3P and passenger's power seat wire harness 3P connectors, at the passenger's power seat wire harness 10P and right side wire harness 10P connectors, at the right side wire harness 14P and dashboard wire harness A 14P connectors, at the dashboard wire harness A 8P and SRS main harness 8P connectors, and at the SRS main harness 8P and the SRS unit 8P connectors.

   Are the connections ok?

   YES – Go to step 2.

   NO – Poor contact; reconnect the affected connector(s) securely.■

2. Buckle the front passenger's seat belt.
3. Erase the DTC memory (see page 23-32).
4. Read the DTC.

   Is DTC 9-4 indicated?

   YES – Go to step 5.

   NO – Go to step 8.

5. Unbuckle the front passenger's seat belt.
6. Erase the DTC memory.
7. Read the DTC.

   Is DTC 9-4 indicated?

   YES – Go to step 19.

   NO – Go to step 27.

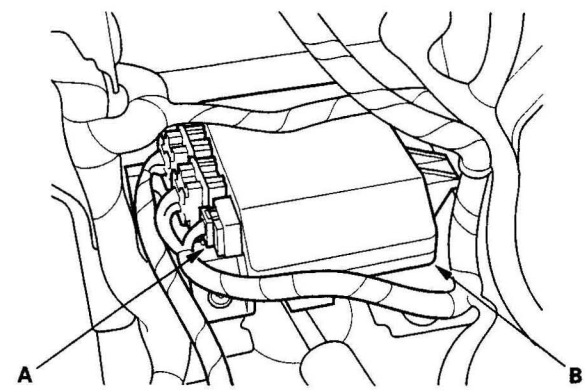
8. Unbuckle the front passenger's seat belt.
9. Erase the DTC memory.
10. Read the DTC.

    Is DTC 9-4 indicated?

    YES – Go to step 11.

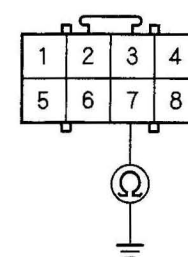
    NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

11. Make sure the front passenger's seat belt is unbuckled, then disconnect the battery negative cable.
12. Disconnect the SRS main harness 8P connector (A) from the SRS unit (B).



13. Check resistance between the No. 7 terminal of the SRS main harness 8P connector and body ground. There should be 1 MΩ or more.

SRS MAIN HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES – Go to step 14.

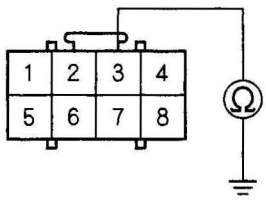
NO – Go to step 17.

BACK

Protected by AR

14. Check resistance between the No. 3 terminal of the SRS main harness 8P connector and body ground. There should be 0 – 1.0 Ω.

SRS MAIN HARNESS 8P CONNECTOR



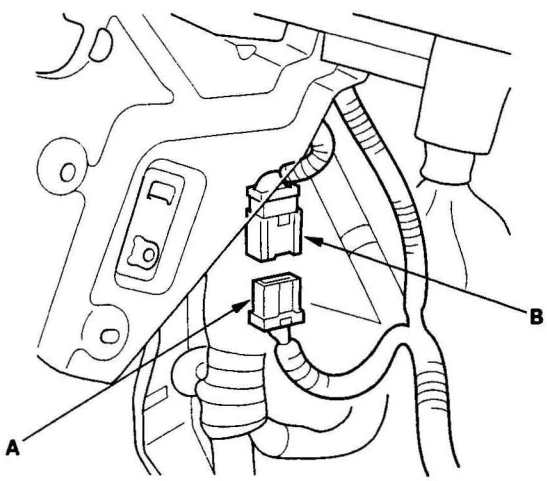
Wire side of female terminals.

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

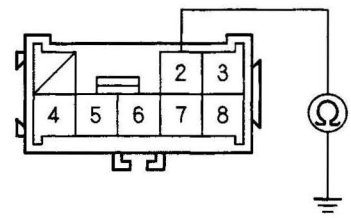
NO – Go to step 15.

15. Disconnect the SRS main harness 8P connector (A) from the dashboard wire harness A 8P connector (B).



16. Check resistance between the No. 2 terminal of the dashboard wire harness A 8P connector and body ground. There should be 0 – 1.0 Ω.

DASHBOARD WIRE HARNESS A 8P CONNECTOR



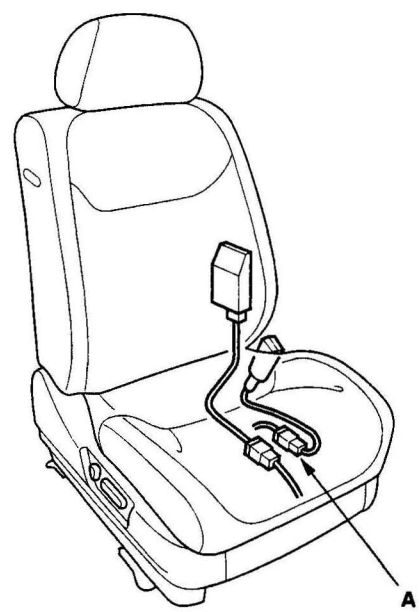
Terminal side of male terminals.

Is the resistance as specified?

YES – Open in the SRS main harness; replace the SRS main harness. ■

NO – Open in dashboard wire harness A, in the right side wire harness, or in the passenger's power seat wire harness or faulty front passenger's seat belt buckle switch; replace the faulty harness or seat belt buckle. ■

17. Disconnect the front passenger's seat belt buckle switch 3P connector (A).



(cont'd)

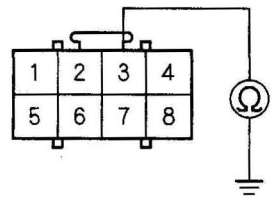
BACK

Protected by AR

DTC Troubleshooting (cont'd)

18. Check resistance between the No. 3 terminal of the SRS main harness 8P connector and body ground. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 8P CONNECTOR



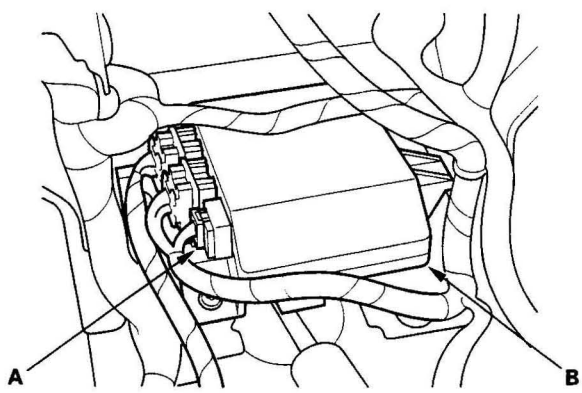
Wire side of female terminals.

Is the resistance as specified?

YES – Faulty front passenger's seat belt buckle switch; replace the front passenger's seat belt buckle. ■

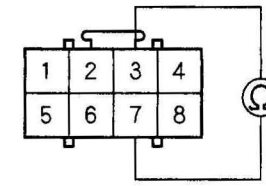
NO – Short to ground in the passenger's power seat wire harness, in the right side wire harness, in dashboard wire harness A or in the SRS main harness; replace the faulty harness. ■

19. Disconnect the battery negative cable, then disconnect the SRS main harness 8P connector (A) from the SRS unit (B).



20. Check resistance between the No. 7 and No. 3 terminals of the SRS main harness 8P connector. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

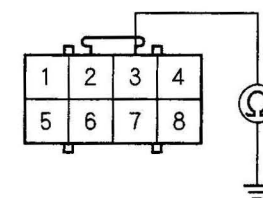
YES – Go to step 21.

NO – Go to step 25.

21. Make sure front seat belt is unbuckled.

22. Check resistance between the No. 3 terminal of the SRS main harness 8P connector and body ground. There should be 0 – 1.0 Ω.

SRS MAIN HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

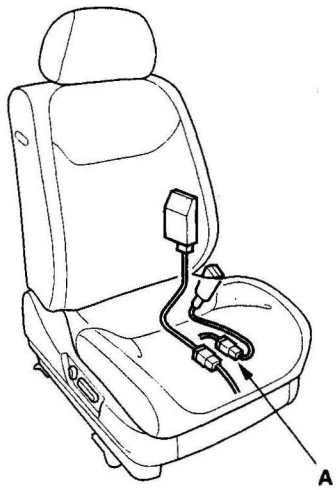
YES – Faulty SRS unit; replace the SRS unit. ■

NO – Go to step 23.

BACK

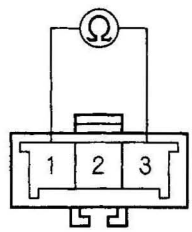
Protected by AR

23. Disconnect the front passenger's seat belt switch 3P connector (A).



24. Check resistance between the No. 3 and No. 1 terminals of the front passenger's seat belt buckle switch 3P connector. There should be 0 – 1.0 Ω.

FRONT PASSENGER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals.

Is the resistance as specified?

YES – Open in the right side wire harness; replace the right side wire harness. ■

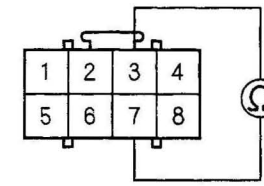
NO – Faulty front seat belt buckle switch; replace the front seat belt buckle. ■

25. Disconnect the front passenger's seat belt buckle switch 3P connector (A).



26. Check resistance between the No. 3 and No. 7 terminals of the SRS main harness 8P connector. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES – Short to another wire in the front passenger's seat belt buckle switch; replace the front passenger's seat belt buckle. ■

NO – Short to another wire in the passenger's power seat wire harness, in the right side wire harness, in the dashboard wire harness or in the SRS main harness; replace the faulty harness. ■

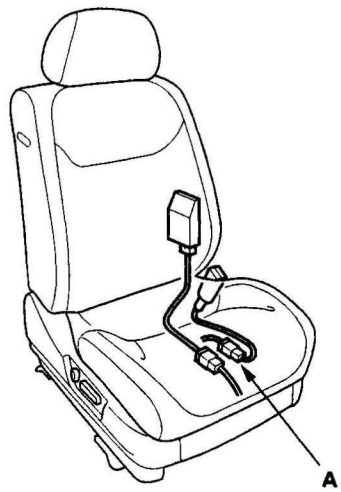
27. Disconnect the battery negative cable, then buckle the front passenger's seat belt.

(cont'd)

Protected by AR

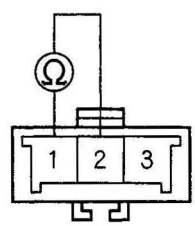
DTC Troubleshooting (cont'd)

28. Disconnect the front passenger's seat belt buckle switch 3P connector (A).



29. Check resistance between the No. 1 and No. 2 terminals of the front passenger's seat belt buckle switch 3P connector. There should be 0 – 1.0 Ω.

FRONT PASSENGER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals.

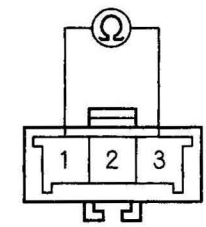
Is the resistance as specified?

YES – Go to step 30.

NO – Open in the front passenger's seat belt buckle switch; replace the front passenger's seat belt buckle. ■

30. Check resistance between the No. 1 and No. 3 terminals of the front passenger's seat belt buckle switch 3P connector. There should be an open circuit, or at least 1 MΩ.

FRONT PASSENGER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



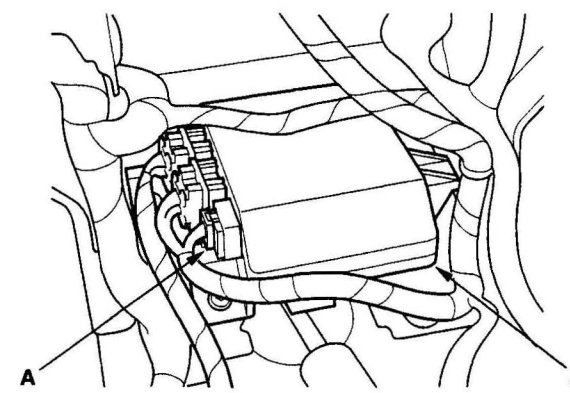
Terminal side of male terminals.

Is the resistance as specified?

YES – Go to step 31.

NO – Short in the front passenger's seat belt buckle switch; replace the front passenger's seat belt buckle. ■

31. Disconnect the SRS main harness 8P connector (A) from the SRS unit (B).

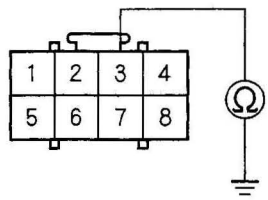


BACK

Protected by AR

32. Check resistance between the No. 3 terminal of the SRS main harness 8P connector and body ground. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 8P CONNECTOR



Wire side of female terminals.

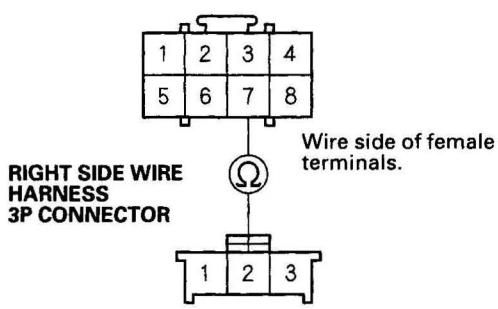
Is the resistance as specified?

YES – Go to step 33.

NO – Go to step 34.

33. Check resistance between the No. 7 terminal of the SRS main harness 8P connector and the No. 2 terminal of the passenger's power seat wire harness 3P connector. There should be 0 – 1.0 Ω.

SRS MAIN HARNESS 8P CONNECTOR

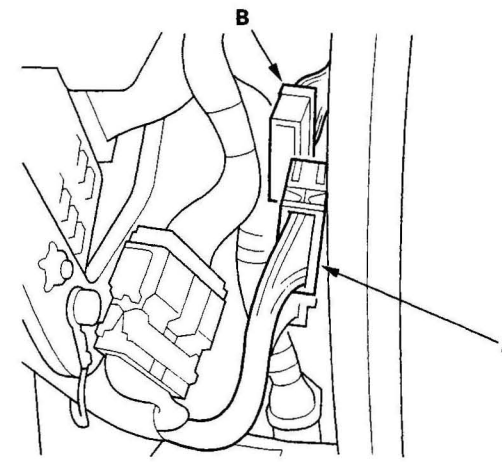


Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

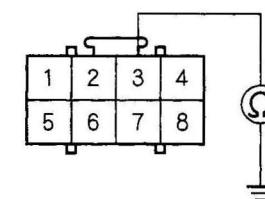
NO – Open in the passenger's power seat wire harness, in the right side wire harness, in dashboard wire harness A or in the SRS main harness; replace the faulty harness. ■

34. Disconnect the right side wire harness 14P connector (A) from the dashboard wire harness A 14P connector (B).



35. Check resistance between the No. 3 terminal of the SRS main harness 8P connector and body ground. There should be an open circuit, or at least 1 MΩ.

SRS MAIN HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES – Short to ground in the right side wire harness or in the passenger's power seat wire harness; replace the faulty harness. ■

NO – Short to ground in dashboard wire harness A or in the SRS main harness; replace the faulty harness. ■

Protected by AR

DTC Troubleshooting (cont'd)

'00-01 Models

DTC 11-1: Open in driver's side airbag inflator

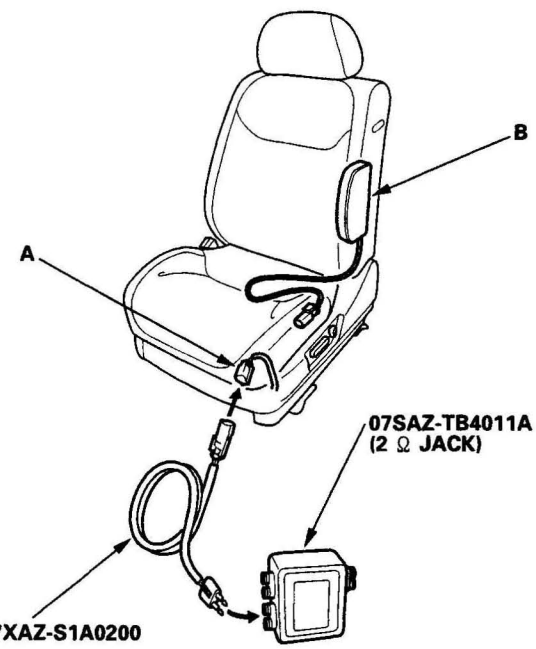
DTC 11-2: Increased resistance in driver's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the *SRS indicator comes on for about 6 seconds, and* then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).

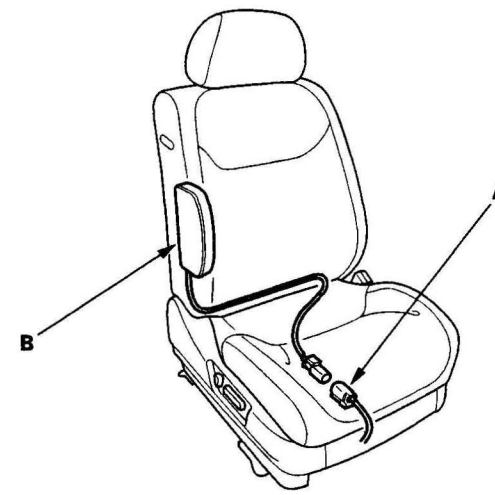


5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

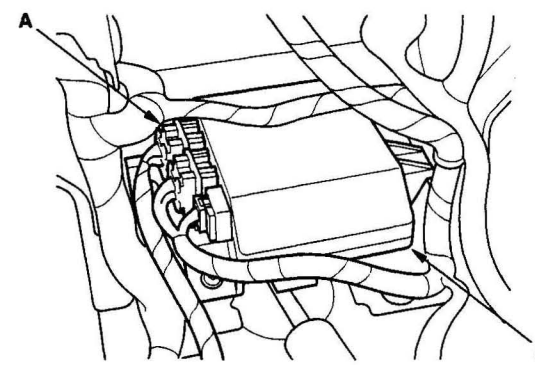
   Is DTC 11-1 or DTC 11-2 Indicated?

   YES – Go to step 9.

   NO – *Open or increased resistance in the driver's* side airbag inflator; replace the driver's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).



11. Disconnect the SRS floor harness 14P connector (A) from the SRS unit (B). Do not disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.

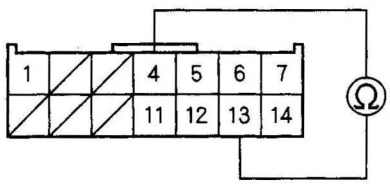


BACK

Protected by AR

12. Check resistance between the No. 4 and No. 13 terminals of the SRS floor harness 14P connector. There should be 2.0—3.0 Ω.

SRS FLOOR HARNESS 14P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at the SRS floor harness 14P connector and the SRS unit; check the connection at the SRS floor harness 14P connector and SRS unit. If the connector is OK, replace the SRS unit. ■

NO—Open or increased resistance in the SRS floor harness; replace the SRS floor harness. ■

'00-01 Models

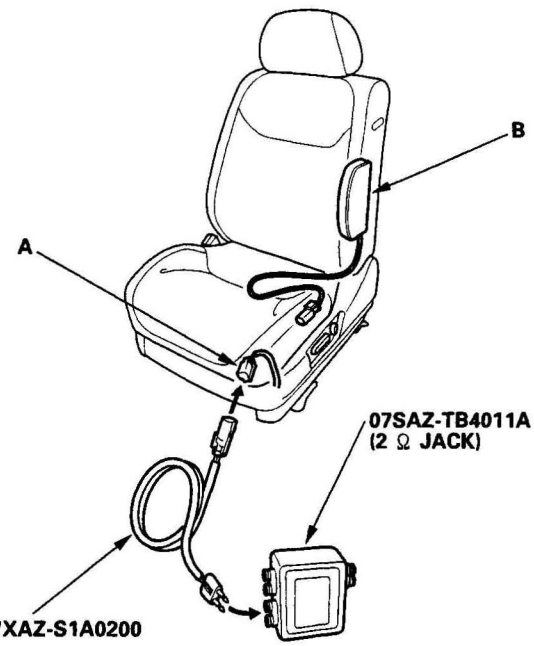
DTC 11-3: Short to another wire or decreased resistance in driver's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).



5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

8. Read the DTC.

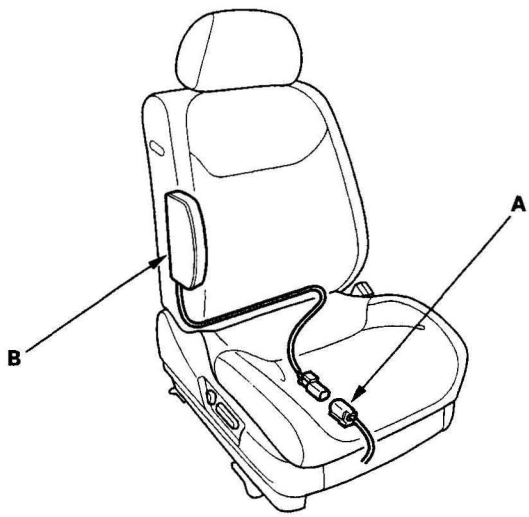
   Is DTC 11-3 indicated?

   YES – Go to step 9.

   NO – Short to another wire in the driver's side airbag inflator; replace the driver's side airbag. ■

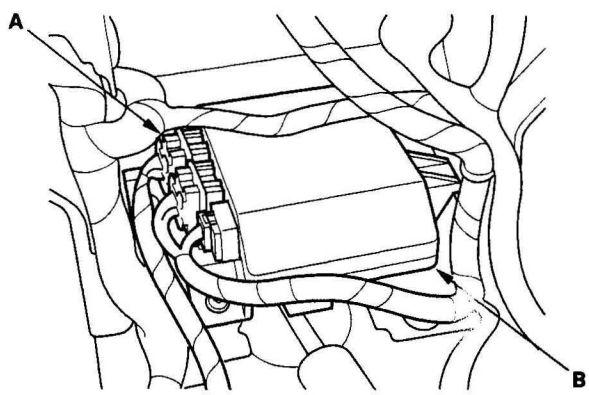
9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).



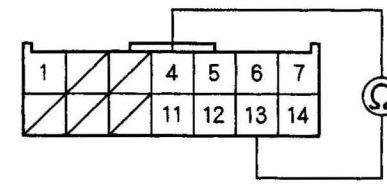
11. Disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.

12. Disconnect the SRS floor harness 14P connector (A) from the SRS unit (B).



13. Check resistance between the No. 4 and No. 13 terminals of the SRS floor harness 14P connector. There should be an open curcuit, or at least 1 MΩ.

SRS FLOOR HARNESS 14P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to another wire in the SRS floor harness; replace the SRS floor harness. ■

BACK

Protected by AR

'00-01 Models

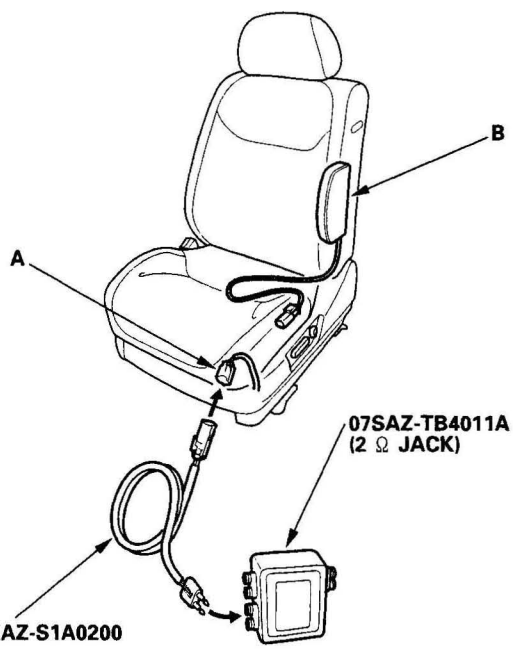
DTC 11-4: Short to power in driver's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).

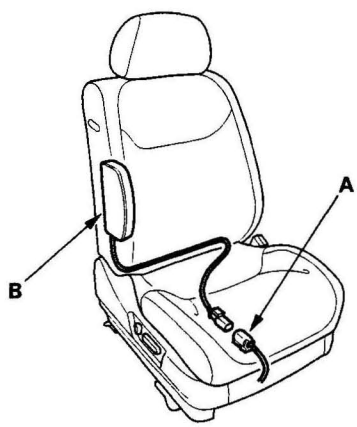


5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

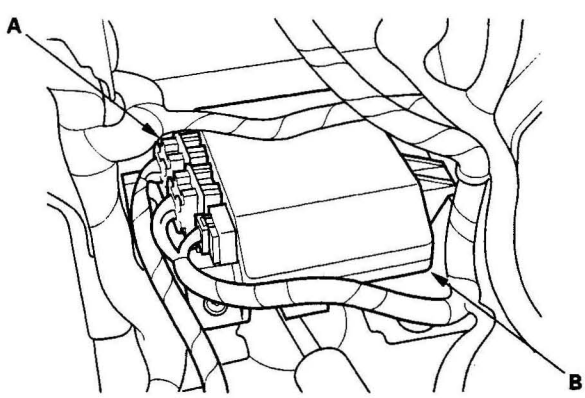
   Is DTC 11-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the driver's side airbag inflator; replace the driver's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes. ■
10. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B), and disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.



11. Disconnect the SRS floor harness 14P connector (A) from the SRS unit (B).



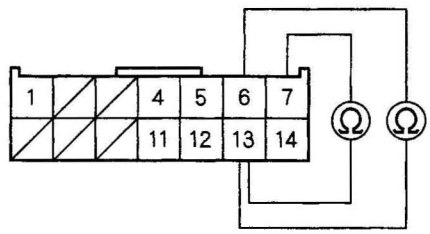
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

12. Check resistance between the No. 13 and No. 6 terminals, and between the No. 13 and No. 7 terminals of the SRS floor harness 14P connector. There should be 1 MΩ or more.

SRS FLOOR HARNESS 14P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit. ■

NO—Short to power in the SRS floor harness; replace the SRS floor harness. ■

'00-01 Models

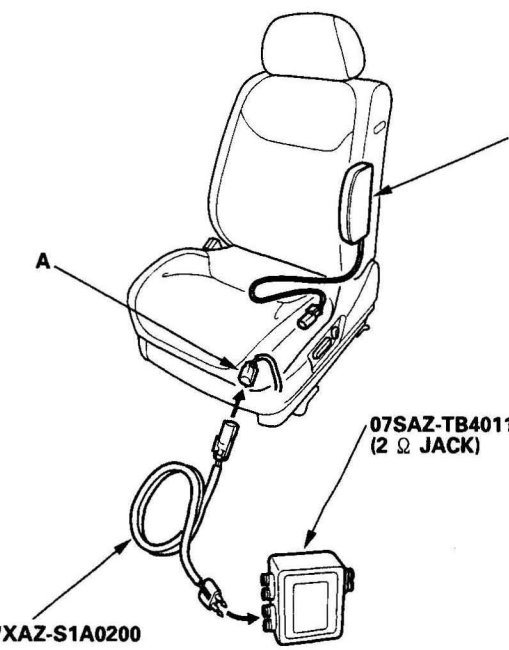
DTC 11-5: Short to ground in driver's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).



5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.

BACK

Protected by AR

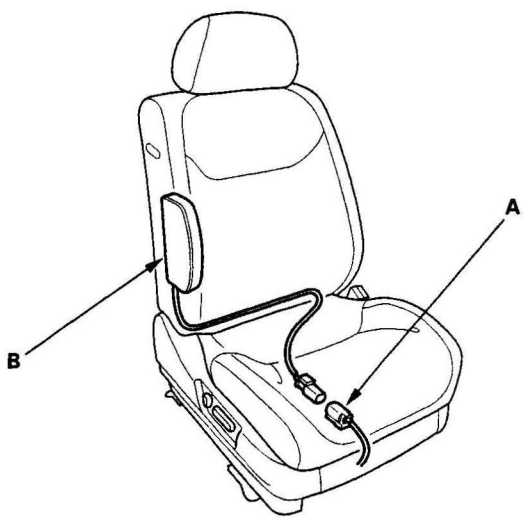
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 11-5 indicated?

   YES – Go to step 9.

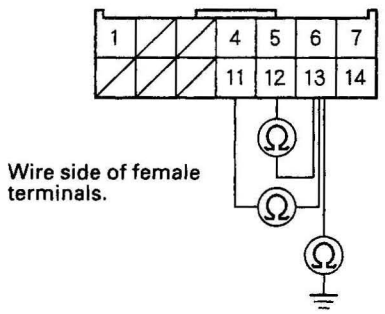
   NO – Short to ground in the driver's side airbag inflator; replace the driver's side airbag. ■

9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B), and disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.



11. Check resistance between the No. 13 and No. 11 terminals, and between the No. 13 and No. 12 terminals of the SRS floor harness 14P connector. Then check resistance between the No. 13 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS FLOOR HARNESS 14P CONNECTOR



Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to ground in the SRS floor harness; replace the SRS floor harness. ■

Protected by AR

DTC Troubleshooting (cont'd)

'00-01 Models

DTC 12-1: Open in front passenger's side airbag inflator

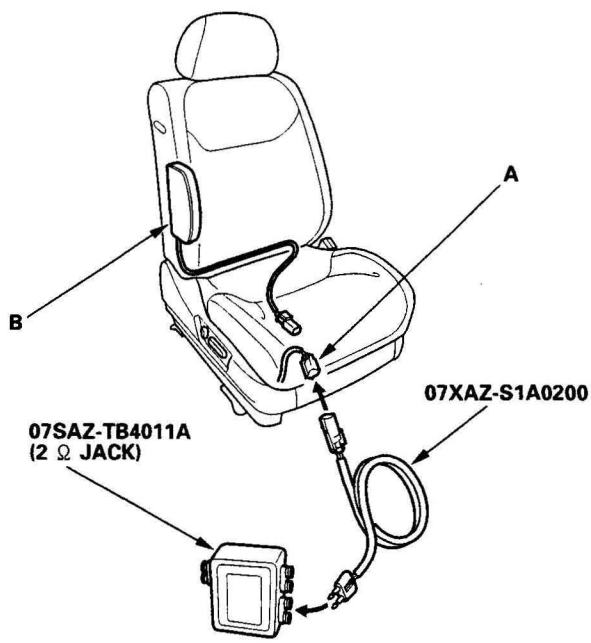
DTC 12-2: Increased resistance in front passenger's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).

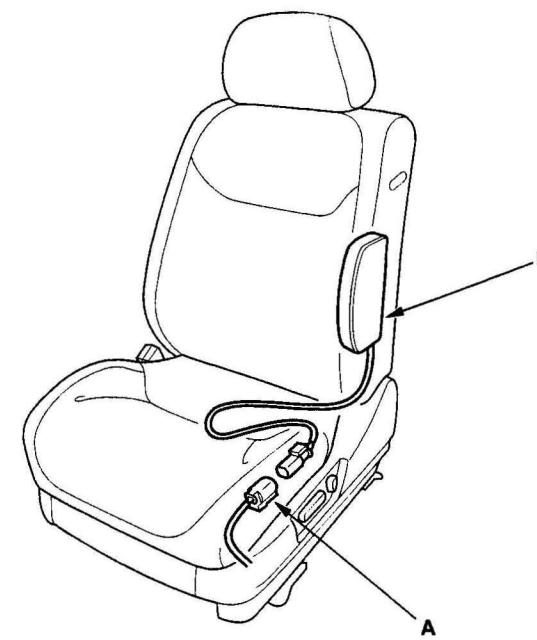


5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 12-1 or DTC 12-2 indicated?

   YES – Go to step 9.

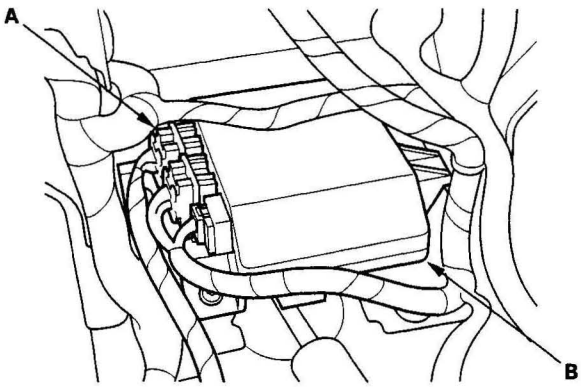
   NO – Open or increased resistance in the front passenger's side airbag inflator, replace the front passenger's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).



BACK

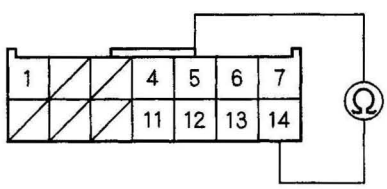
Protected by AR

11. Disconnect the SRS floor harness 14P connector (A) from the SRS unit (B). Do not disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.



12. Check resistance between the No. 5 and No. 14 terminals of the SRS floor 14P connector. There should be 2.0—3.0 Ω.

SRS FLOOR HARNESS 14P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at the SRS floor harness 14P connector and the SRS unit; check the connection at the SRS floor harness 14P connector and SRS unit. If the connector is OK, replace the SRS unit.■

NO—Open or increased resistance in the SRS floor harness; replace the SRS floor harness.■

'00-01 Models

DTC 12-3: Short to another wire or decreased resistance in front passenger's side airbag inflator

1. Erase the DTC memory (see page 23-32).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

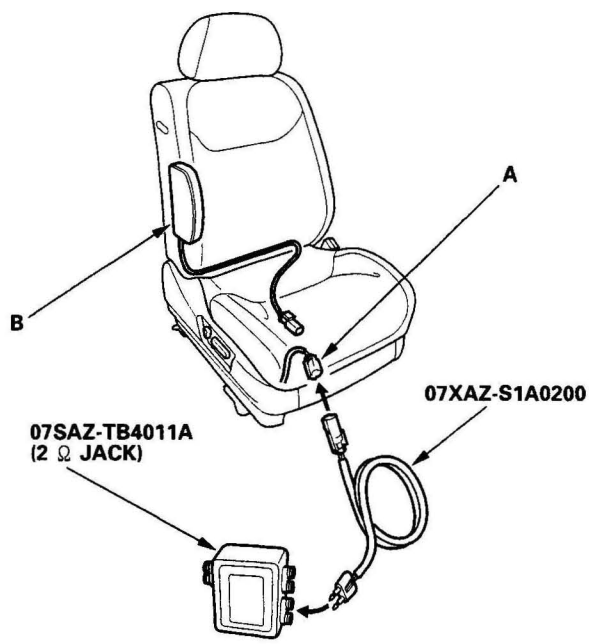
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

3. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the SRS floor harness 2P connector (A) from the passenger's side airbag (B).



5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.

(cont'd)

Protected by AR

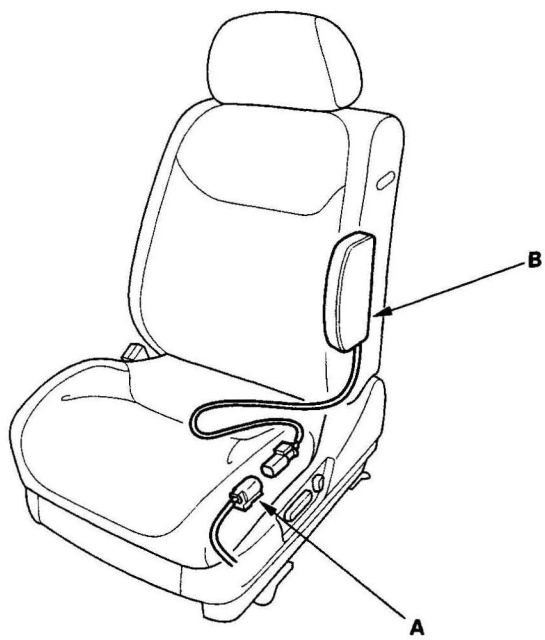
DTC Troubleshooting (cont'd)

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

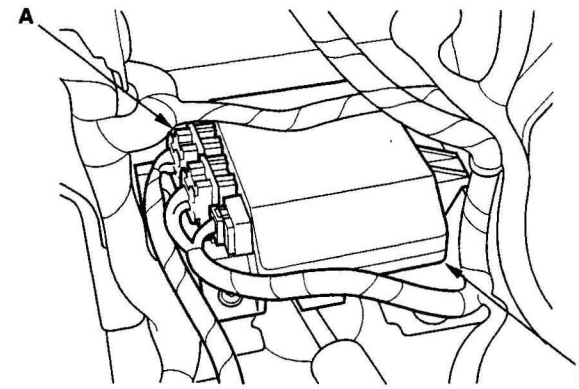
   Is DTC 12-3 indicated?

   YES – Go to step 9

   NO – Short to another wire in the front passenger's side airbag inflator; replace the front passenger's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).

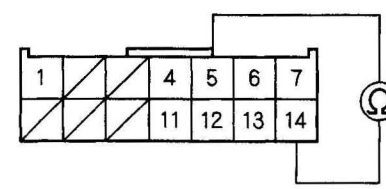


11. Disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.
12. Disconnect the SRS floor harness 14P connector (A) from the SRS unit (B).



13. Check resistance between the No. 5 and No. 14 terminals of the SRS floor harness 14P connector. There should be an open circuit, or at least 1 MΩ.

SRS FLOOR HARNESS 14P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to another wire in the SRS floor harness; replace the SRS floor harness. ■

BACK

Protected by AR

'00-01 Models

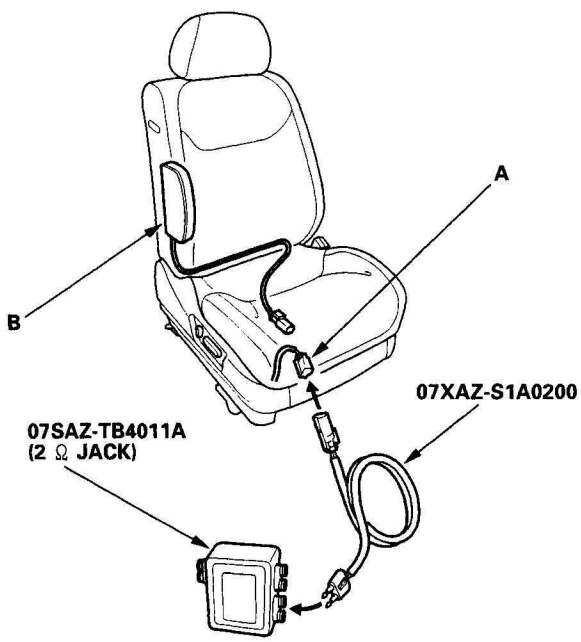
DTC 12-4: Short to power in front passenger's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).

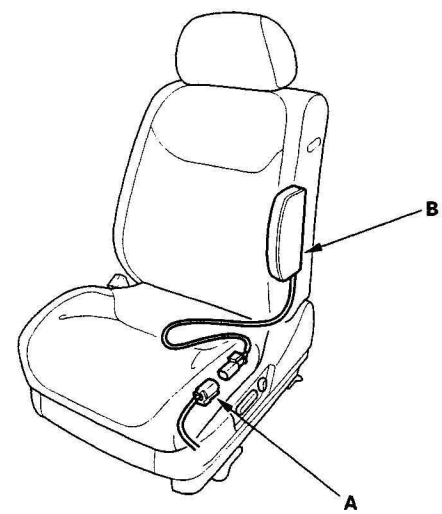


5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

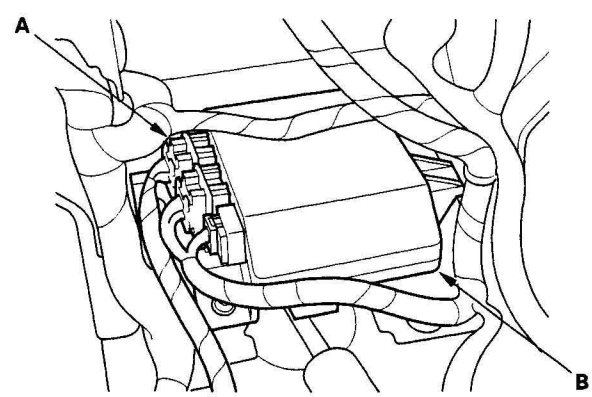
   Is DTC 12-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the front passenger's side airbag inflator; replace the front passenger's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the front driver's side airbag (B).



11. Disconnect the SRS floor harness 14P connector (A) from the SRS unit (B).



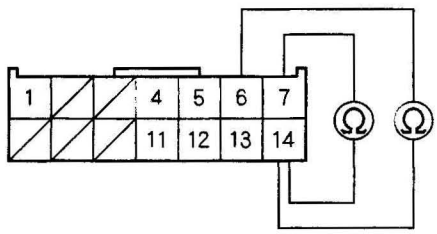
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

12. Check resistance between the No. 14 and No. 6 terminals of the SRS floor harness 14P connector, and between the No. 14 and No. 7 terminals. There should be an open circuit, or at least 1 MΩ.

SRS FLOOR HARNESS 14P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to power in the SRS floor harness; replace the SRS floor harness. ■

'00-01 Models

DTC 12-5: Short to ground in front passenger's side airbag inflator

1. Erase the DTC memory (see page 23-32).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

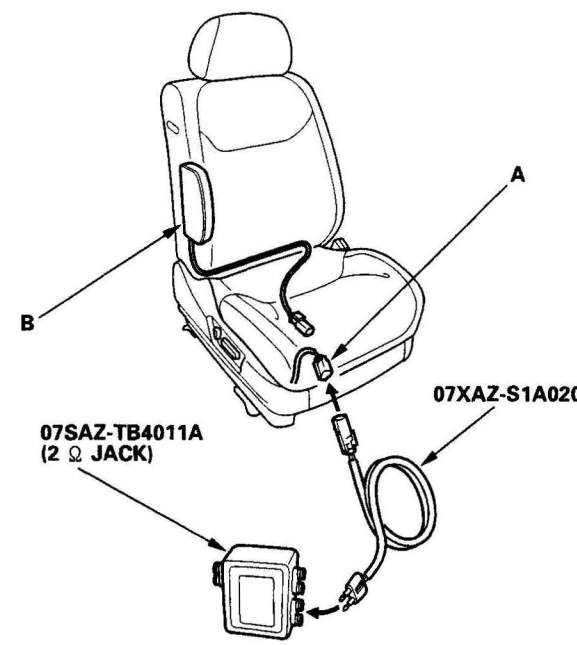
   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

3. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).



5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.

BACK

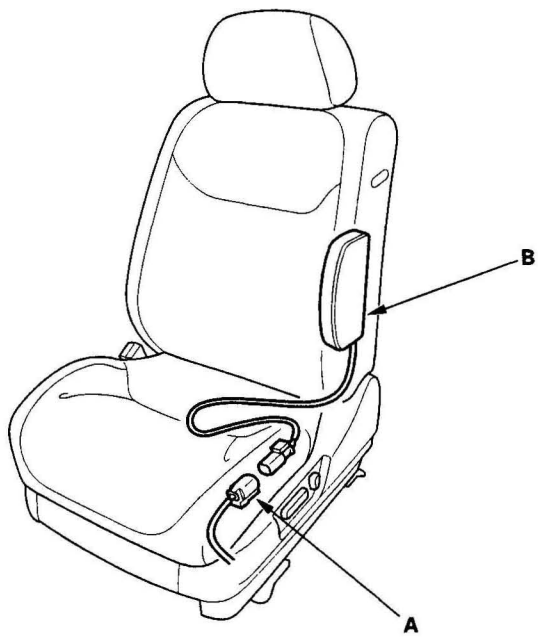
Protected by AR

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 12-5 indicated?

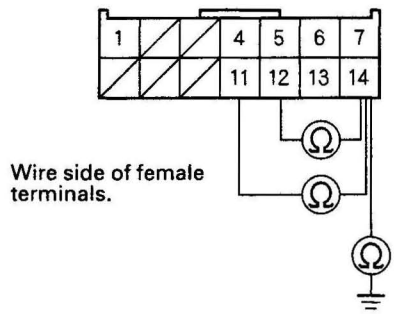
   YES – Go to step 9.

   NO – Short to ground in the front passenger's side airbag inflator, replace the front passenger's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).



11. Check resistance between the No. 14 and No. 11 terminals of the SRS floor harness 14P connector, and between the No. 14 and No. 12 terminals. Then check resistance between the No. 14 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS FLOOR HARNESS 14P CONNECTOR



Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to ground in the SRS floor harness; replace the SRS floor harness. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'00-01 Models

DTC 13-1: Faulty driver's side impact sensor or SRS unit

DTC 13-2: Faulty driver's side impact sensor or SRS unit

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Faulty driver's side impact sensor or SRS unit; replace the driver's side impact sensor. If the problem is still present, replace the SRS unit. ■

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

'00-01 Models

DTC 13-3: No signal from the driver's side impact sensor

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Check the connection between the SRS floor harness 4P connector and the driver's side impact sensor.

   Is the connections OK?

   YES – Faulty SRS floor harness or driver's side impact sensor; replace the SRS floor harness. If the problem is still present, replace the driver's side impact sensor. ■

   NO – Poor contact between the SRS floor harness 4P connector and the driver's side impact sensor; reconnect or replace the sensor. ■

BACK

Protected by AR

'00-01 Models

DTC 14-1: Faulty front passenger's side impact sensor or SRS unit

DTC 14-2: Faulty front passenger's side impact sensor or SRS unit

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES—Faulty front passenger's side impact sensor or SRS unit; replace the front passenger's side impact sensor. If the problem is still present, replace the SRS unit.■

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

'00-01 Models

DTC 14-3: No signal from the front passenger's side impact sensor

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Check the connection between the SRS floor harness 4P connector and the front passenger's side impact sensor.

   Is the connections OK?

   YES—Faulty SRS floor harness or front passenger's side impact sensor; replace the SRS floor harness. If the problem is still present, replace the front passenger's side impact sensor.■

   NO—Poor contact between the SRS floor harness 4P connector and the front passenger's side impact sensor; reconnect or replace the sensor.■

Protected by AR

DTC Troubleshooting (cont'd)

'00-01 Models

DTC 15-1: Faulty OPDS unit

NOTE: If a new OPDS unit was installed, verify it has the correct part number before continuing.

1. Make sure nothing is sitting on the front passenger's seat.
2. Initialize the OPDS unit (see page 23-33).
3. Erase the DTC memory (see page 23-32).
4. Read the DTC.

   Is DTC 15-1 indicated?

   YES – Go to step 5.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

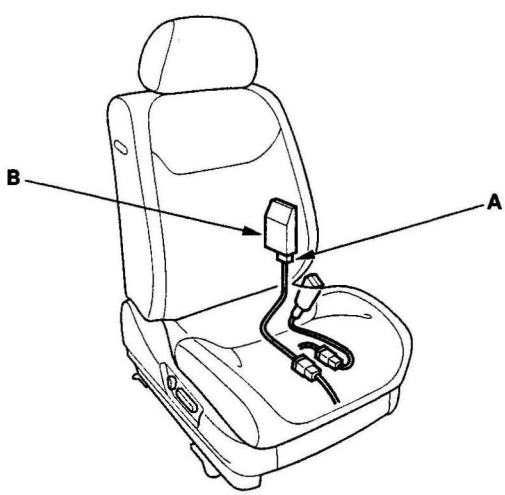
5. Check the No. 7 (7.5 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 6.

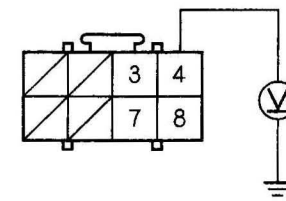
   NO – Go to step 13.

6. Disconnect the OPDS unit harness 8P connector (A) from the OPDS unit (B).



7. Turn the ignition switch ON (II).
8. Check for voltage between the No. 4 terminal of the OPDS unit harness 8P connector and body ground. There should be battery voltage.

OPDS UNIT HARNESS 8P CONNECTOR



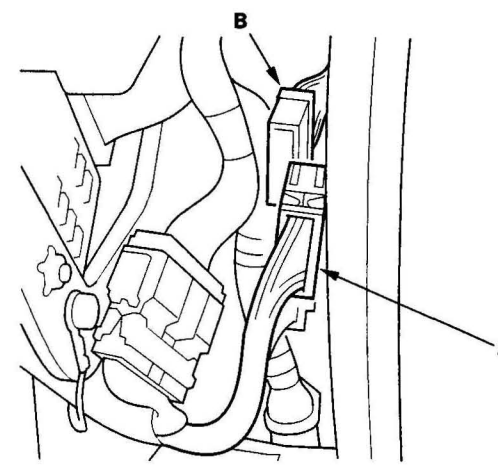
Wire side of female terminals.

Is there battery voltage?

YES – Go to step 28.

NO – Go to step 9.

9. Turn the ignition switch OFF.
10. Disconnect the right side wire harness 14P connector (A) from the dashboard wire harness A 14P connector (B).



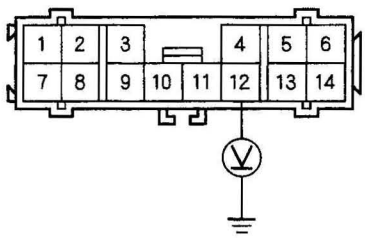
11. Turn the ignition switch ON (II).

BACK

Protected by AR

12. Check for voltage between the No. 12 terminal of the dashboard wire harness A 14P connector and body ground. There should be battery voltage.

DASHBOARD WIRE HARNESS A 14P CONNECTOR



Terminal side of male terminals

Is there battery voltage?

YES – Open in the right side wire harness or OPDS unit harness; if the OPDS unit harness is OK, replace the SRS floor harness. ■

NO – Open in dashboard wire harness A; replace the dashboard wire harness A. ■

13. Replace the No. 7 (7.5 A) fuse in the driver's under-dash fuse/relay box.

14. Turn the ignition switch ON (II) for 30 seconds, then turn it OFF.

15. Check the No. 7 (7.5 A) fuse in driver's under-dash fuse/relay box.

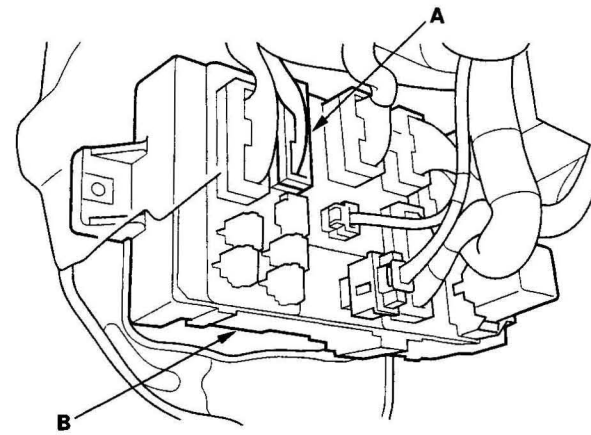
Is the fuse OK?

YES – END

NO – Go to step 16.

16. Replace the No. 7 (7.5 A) fuse in the driver's under-dash fuse/relay box.

17. Disconnect the dashboard wire harness A 18P connector (A) from the driver's under-dash fuse/relay box (B).



18. Turn the ignition switch ON (II) for 30 seconds, then turn it off.

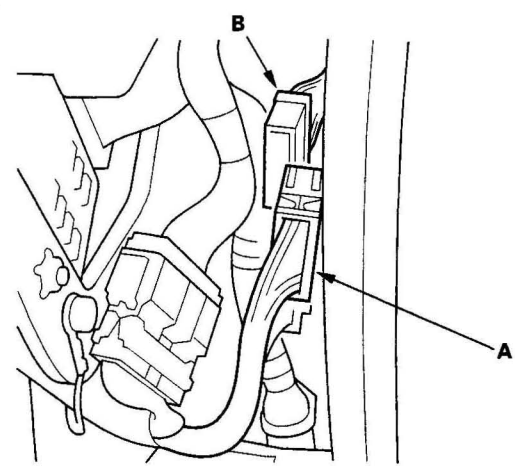
19. Check the No. 7 (7.5 A) fuse in the driver's under-dash fuse/relay box.

Is the fuse OK?

YES – Go to step 20.

NO – Short to ground in the No. 7 (7.5 A) circuit; refer to section 22 and continue troubleshooting. ■

20. Disconnect the right side wire harness 14P connector (A) from the dashboard wire harness A 14P connector (B).



(cont'd)

BACK

Protected by AR

DTC Troubleshooting (cont'd)

21. Connect the dashboard wire harness A 18P connector to the driver's under-dash fuse/relay box.

22. Turn ignition switch ON (II) for 30 seconds, then turn it OFF.

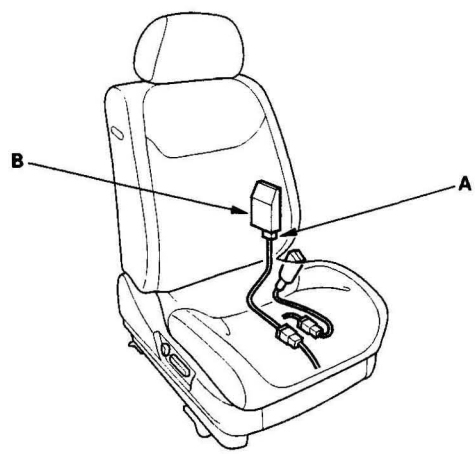
23. Check the No. 7 (7.5 A) fuse in the driver's under-dash fuse/relay box.

    Is the fuse OK?

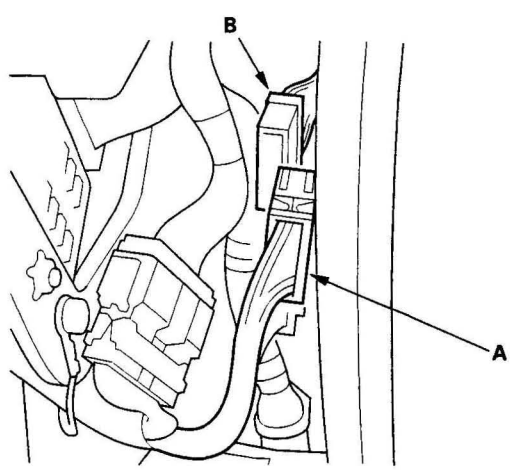
    YES – Go to step 24.

    NO – Short to ground in dashboard wire harness A; replace dashboad wire harness A. ■

24. Disconnect the OPDS unit harness 8P connector (A) from the OPDS unit (B).



25. Reconnect the right side wire harness 14P connector (A) to the dashboard wire harness A 14P connector (B).



26. Turn the ignition switch ON (II) for 30 seconds. Then turn it OFF.

27. Check the No. 7 (7.5 A) fuse in the driver's under-dash fuse/relay box.

    Is the fuse OK?

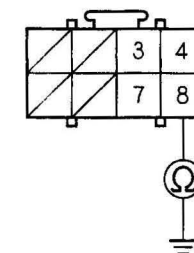
    YES – Faulty OPDS unit; replace the OPDS unit. ■

    NO – Short to ground in the right side wire harness or OPDS unit harness; if the OPDS unit harness is OK, replace the right side wire harness. ■

28. Turn the ignition switch OFF.

29. Check resistance between the No. 8 terminal of the OPDS unit harness 8P connector and body ground. There should be 0 – 1.0 Ω.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

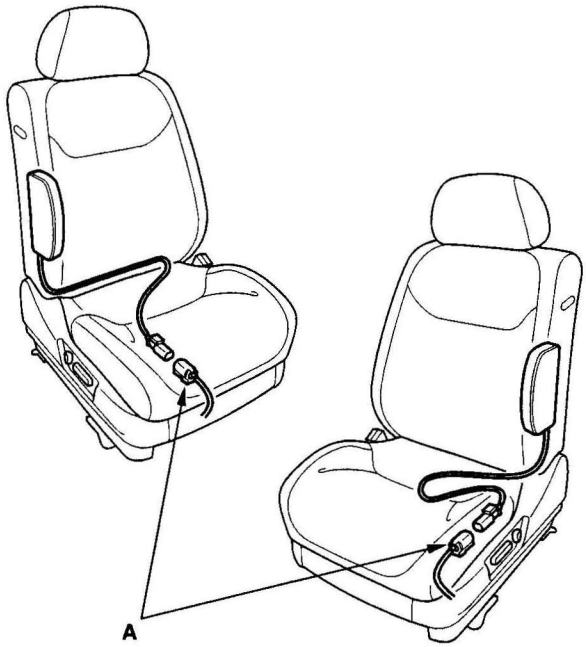
YES – Go to step 30.

NO – Open in the right side wire harness or OPDS unit harness; if the OPDS unit harness is OK, replace the right side wire harness. ■

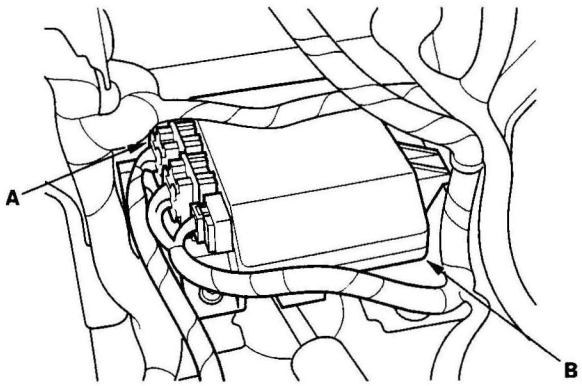
BACK

Protected by AR

30. Disconnect the side airbag connectors (A).

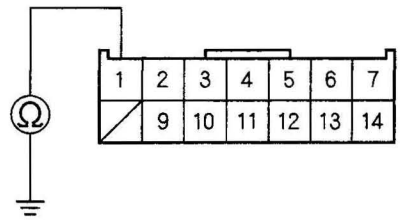


31. Disconnect the SRS floor harness 14P connector (A) from the SRS unit (B).



32. Check resistance between the No. 1 terminal of the SRS floor harness 14P connector and body ground. There should be an open circuit, or at least 1 MΩ.

SRS FLOOR HARNESS 14P CONNECTOR



Wire side of female terminals.

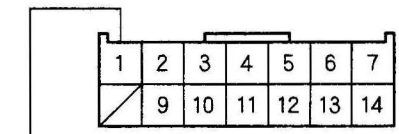
Is the resistance as specified?

YES – Go to step 33.

NO – Short to ground in the SRS floor harness, in the right side wire harness or in the OPDS unit harness; replace the faulty harness.■

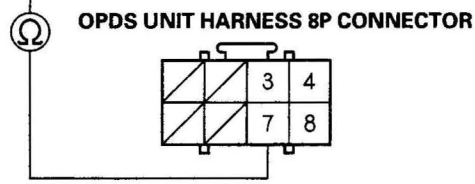
33. Check resistance between the No. 1 terminal of the SRS floor harness 14P connector and the No. 7 terminal of the OPDS unit harness 8P connector. There should be 0 – 1.0 Ω.

SRS FLOOR HARNESS 14P CONNECTOR



Wire side of female terminals.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the resistance as specified?

YES – Go to step 34.

NO – Open in the SRS floor harness, in the right side wire harness or in the OPDS unit harness; replace the faulty harness.■

(cont'd)

BACK

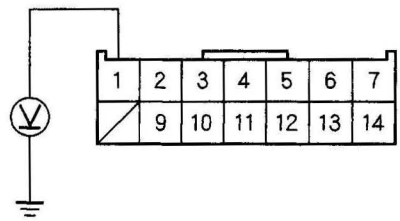
Protected by AR

DTC Troubleshooting (cont'd)

34. Turn the ignition switch ON (II).

35. Check for voltage between the No. 1 terminal of the SRS floor harness 14P connector and body ground. There should be 0.5 V or less.

SRS FLOOR HARNESS 14P CONNECTOR



Wire side of female terminals.

Is the voltage as specified?

YES – Go to step 36.

NO – Short to power in the SRS floor harness, in the right side wire harness or in the OPDS unit harness; replace the faulty harness. ■

36. Turn the ignition switch OFF.

37. Install a known-good OPDS unit.

38. Reconnect all connectors.

39. Initialize the OPDS unit.

40. Erase the DTC memory.

41. Read the DTC.

Is DTC 15-1 indicated?

YES – Go to step 42.

NO – END. ■

42. Turn the ignition switch ON (II), and check that the side airbag indicator light comes on for about 5 seconds, and then goes off.

Does the side airbag indicator stay on?

YES – Faulty OPDS unit or SRS unit; replace the OPDS unit. If the problem is still present, replace the SRS unit. ■

NO – Faulty side airbag indicator light circuit; go to the troubleshooting procedure for DTC 15-2. ■

BACK

Protected by AR

'00-01 Models

DTC 15-2: Faulty side airbag cutoff indicator circuit

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Make sure nothing is sitting on the front passenger's seat.
4. Turn the ignition switch ON (II), and check that the side airbag indicator light comes on.

   Does the side airbag indicator light come on?

   YES – Go to step 5.

   NO – Go to step 6.
5. Make sure the side airbag indicator light comes on for 5 seconds and then goes off.

   Does the side airbag indicator light go off?

   YES – Faulty OPDS unit or SRS unit; replace the OPDS unit. If the problem is still present, replace the SRS unit.■

   NO – Go to step 34.
6. Turn the ignition switch OFF.
7. Check the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

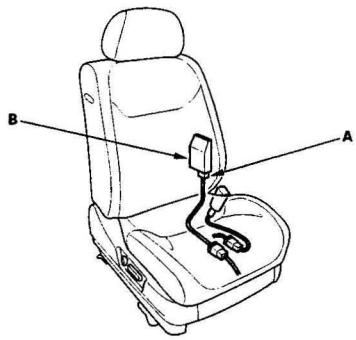
   YES – Go to step 8.

   NO – Short to ground in the No. 9 (7.5 A) fuse circuit; refer the section 22 and continue troubleshooting.■
8. Check for a blown side airbag cutoff indicator light bulb.

   Is the side airbag cutoff indicator light bulb OK?

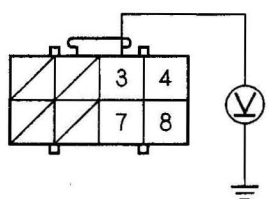
   YES – Go to step 9.

   NO – Blown side airbag cutoff indicator bulb; replace the bulb.■
9. Disconnect the OPDS unit harness 8P connector (A) from the OPDS unit (B).



10. Turn the ignition switch ON (II).
11. Check for voltage between the No. 3 terminal of the OPDS unit harness 8P connector and body ground. There should be battery voltage.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals.

Is there battery voltage?

YES – Go to step 12.

NO – Go to step 24.

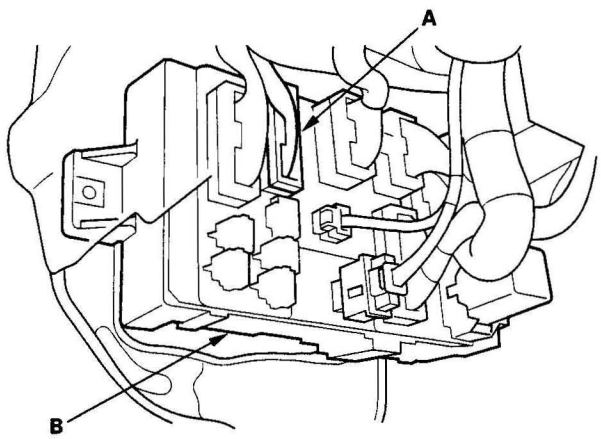
12. Turn the ignition switch OFF.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

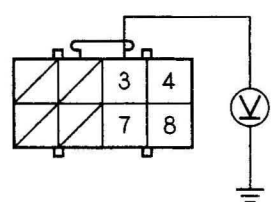
13. Disconnect dashboard wire harness A 18P connector from the driver's under-dash fuse/relay box.



14. Turn the ignition switch ON (II).

15. Check for voltage between the No. 3 terminal of the OPDS unit harness 8P connector and body ground. There should be 0.5 V or less.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals.

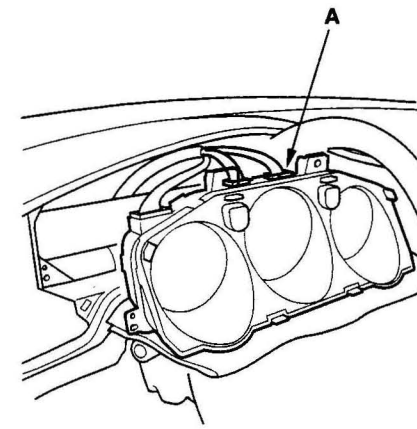
Is the voltage as specified?

YES – Faulty OPDS unit; replace the OPDS unit. ■

NO – Go to step 16.

16. Turn the ignition switch OFF.

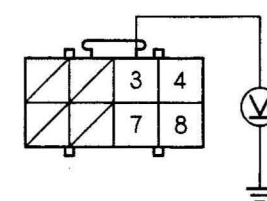
17. Disconnect dashboard wire harness A 18P (A) connector from the gauge assembly.



18. Turn the ignition switch ON (II).

19. Check for voltage between the No. 3 terminal of the OPDS unit harness 8P connector and body ground. There should be 0.5 V or less.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the voltage as specified?

YES – Short to power in the gauge assembly; replace the gauge assembly. ■

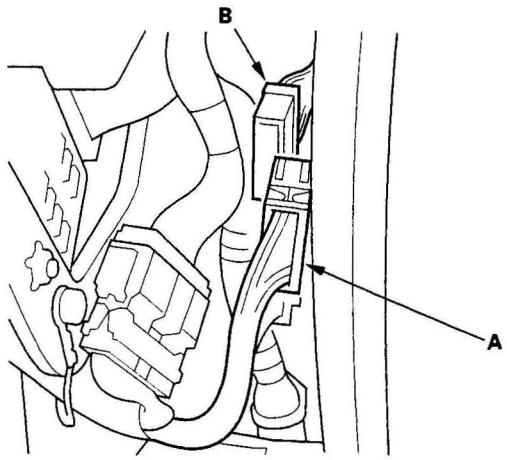
NO – Go to step 20.

BACK

Protected by AR

20. Turn the ignition switch OFF.

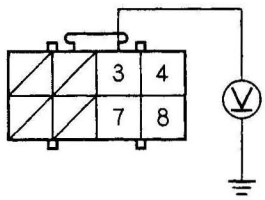
21. Disconnect the right side wire harness 14P connector (A) from the dashboard wire harness A 14P connector (B).



22. Turn the ignition switch ON (II).

23. Check for voltage between the No. 3 terminal of the OPDS unit harness 8P connector and body ground. There should be 0.5 V or less.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the voltage as specified?

YES – Short to power in dashboard wire harness A; replace dashboard wire harness A.■

NO – Short to power in the right side wire harness or the OPDS unit harness; if the OPDS unit harness is OK, replace the right side wire harness.■

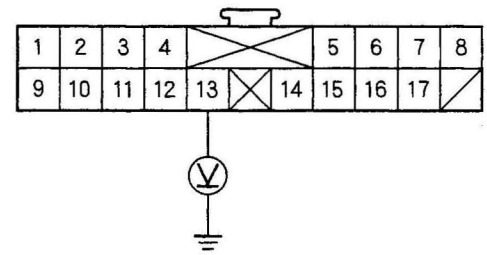
24. Turn the ignition switch OFF.

25. Backprobe the No. 13 terminal of the dashboard wire harness A 18P connector. Do not disconnect the dashboard wire harness A 18P connector from the gauge assembly.

26. Turn the ignition switch ON (II).

27. Check for voltage between the No. 13 terminal of the dashboard wire harness A 18P connector and body ground. There should be battery voltage.

DASHBOARD WIRE HARNESS A 18P CONNECTOR



Wire side of female terminals.

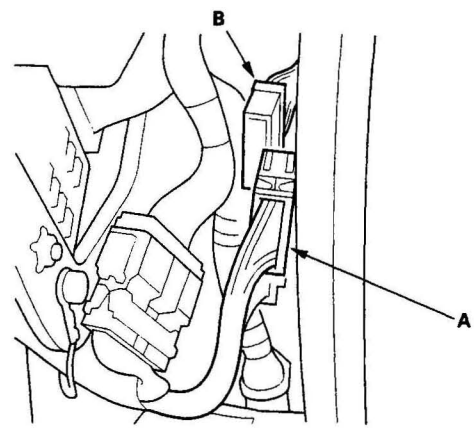
Is there battery voltage?

YES – Go to step 28.

NO – Go to step 32.

28. Turn the ignition switch OFF.

29. Disconnect the right side wire harness 14P connector (A) from the dashboard wire harness A 14P connector (B).



(cont'd)

BACK

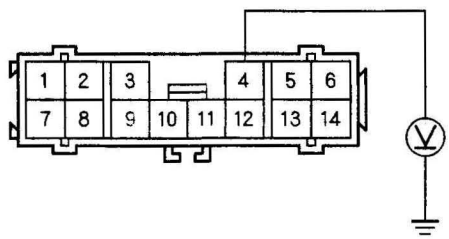
Protected by AR

DTC Troubleshooting (cont'd)

30. Turn the ignition switch ON (II).

31. Check for voltage between the No. 4 terminal of the dashboard wire harness A 14P connector and body ground. There should be battery voltage.

DASHBOARD WIRE HARNESS A 14P CONNECTOR



Terminal side of male terminals.

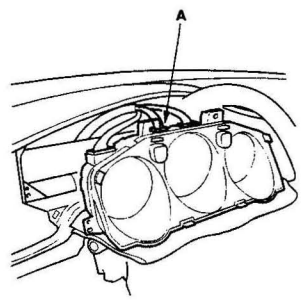
Is there battery voltage?

YES – Poor contact at the dashboard wire harness A 14P and right side wire harness 14P connectors or an open in the right side wire harness or in the OPDS unit harness. Check the connection between the dashboard wire harness A 14P and right side wire harness 14P connectors; if the connection is OK, replace the faulty harness. ■

NO – Poor contact at the dashboard wire harness A 18P and gauge assembly 18P connectors or an open in dashboard wire harness A. Check the dashboard wire harness A 18P and gauge assembly 18P connectors; if the connection is OK, replace dashboard wire harness A. ■

32. Turn the ignition switch OFF.

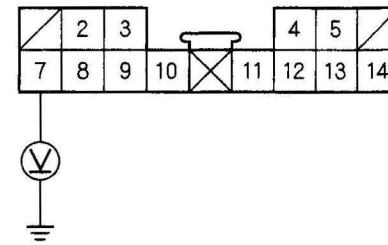
33. Disconnect the dashboard wire harness A 14P connector (A) from the gauge assembly.



34. Turn the ignition switch ON (II).

35. Check for voltage between the No. 7 terminal of the dashboard wire harness A 14P connector and body ground. There should be battery voltage.

DASHBOARD WIRE HARNESS A 14P CONNECTOR



Wire side of female terminals

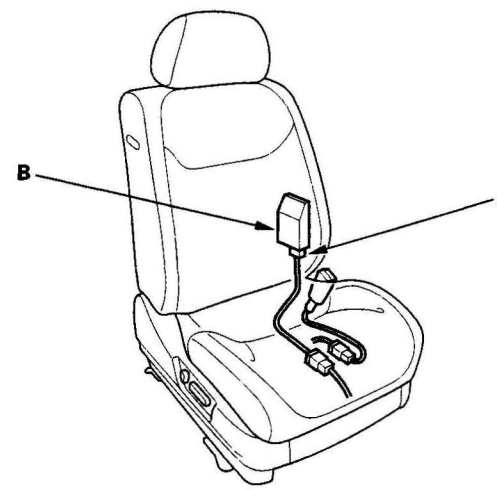
Is there battery voltage?

YES – Faulty side airbag indicator light circuit; replace the gauge assembly. ■

NO – Open in dashboard wire harness A; replace dashboard wire harness A. ■

36. Turn the ignition switch OFF.

37. Disconnect the OPDS unit harness 8P connector (A) from the OPDS unit (B).



BACK

Protected by AR

38. Turn the ignition switch ON (II).

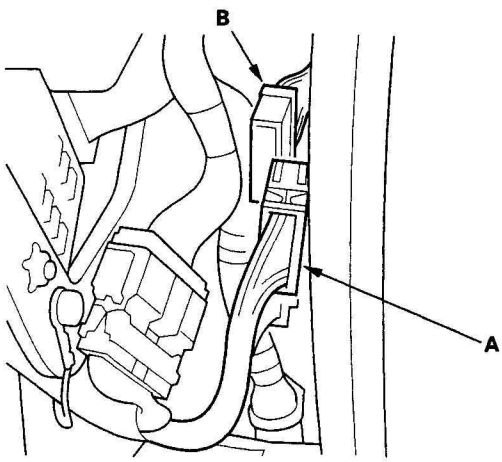
Does the side airbag cutoff indicator stay off?

YES – Faulty OPDS unit; replace the OPDS unit. ■

NO – Go to step 39.

39. Turn the ignition switch OFF.

40. Disconnect the right side wire harness 14P connector (A) from the dashboard wire harness A 14P connector (B).



41. Turn the ignition switch ON (II).

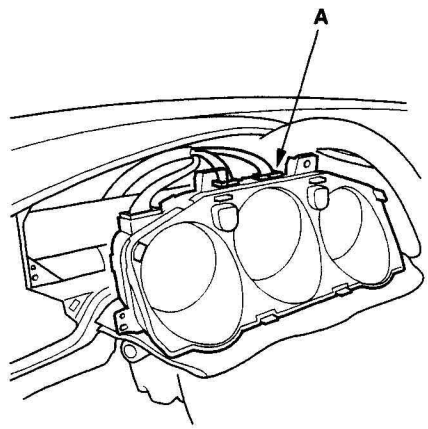
Does the side airbag indicator light stay off?

YES – Short to ground in the right side wire harness or the OPDS unit harness; if the OPDS unit harness is OK, replace the right side wire harness. ■

NO – Go to step 42.

42. Turn the ignition switch OFF.

43. Disconnect the dashboard wire harness A 18P connector (A) from the gauge assembly.



44. Turn the ignition switch ON (II).

Does the side airbag indicator light stay off?

YES – Short to ground in dashboard wire harness A; replace dashboard wire harness A. ■

NO – Short to ground in the gauge assembly; replace the gauge assembly. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'00-01 Models

DTC 15-3: Faulty OPDS sensor.

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Check the connection at the OPDS sensor harness connector and the OPDS unit connector.

   Are the connections OK?

   YES – Go to step 4.

   NO – Reconnect the OPDS sensor harness connector, and clear the DTC. ■
4. Replace the OPDS sensor/seat back foam (see page 20-78),and reinitialize the OPDS system (see page 23-33).
5. Erase the DTC memory, then check for DTC 15-3

   Is DTC 15-3 indicated?

   YES – Replace the OPDS unit (see page 23-240). ■

   NO – The system is OK. ■

BACK

Protected by AR

'02-03 Models

DTC 1-1: Open in driver's airbag inflator

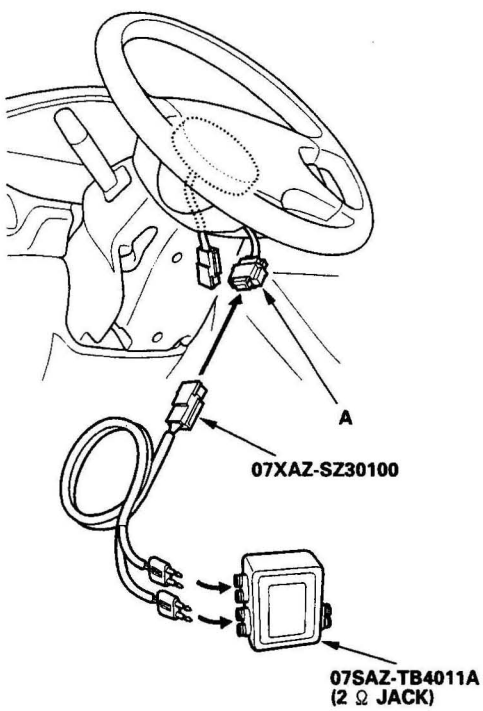
DTC 1-2: Increased resistance in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 4P connector from the cable reel 4P connector (A).



5. Connect the special tool (2 Ω) to the cable reel 4P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-1 or DTC 1-2 indicated?

   YES – Go to step 9.

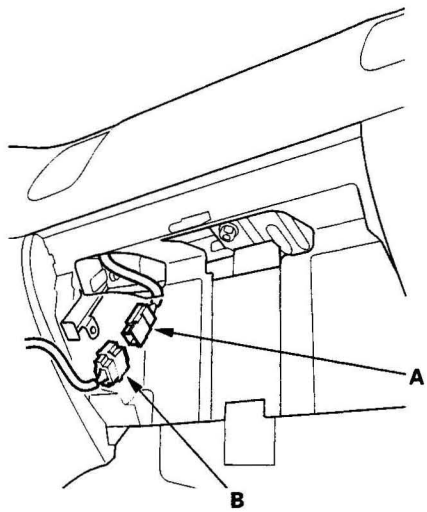
   NO – Open or increased resistance in the driver's airbag inflator; replace the driver's airbag (see page 23-219).■
9. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

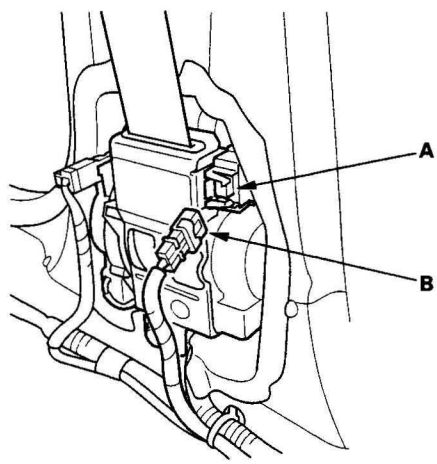
Protected by AR

DTC Troubleshooting (cont'd)

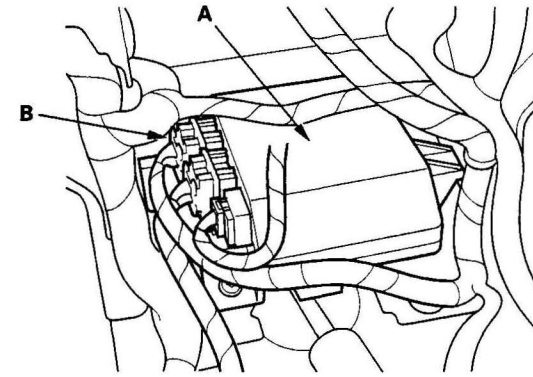
10. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B).



11. Disconnect both seat belt tensioner 2P connectors (A) from the side wire harness 2P connectors (B).

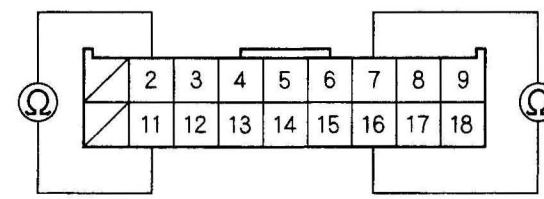


12. Disconnect SRS unit connector B (18P) from the SRS unit (A).



13. Check resistance between the No. 7 and the No. 16 terminals and between the No. 2 and the No. 11 terminals of SRS unit connector B (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector B (18P) and the SRS unit. Check the connection between the connector and the SRS unit. If the connection is OK, replace the SRS unit.■

NO—Open or increased resistance in the SRS main harness or cable reel; replace the SRS main harness or cable reel.■

BACK

Protected by AR

'02-03 Models

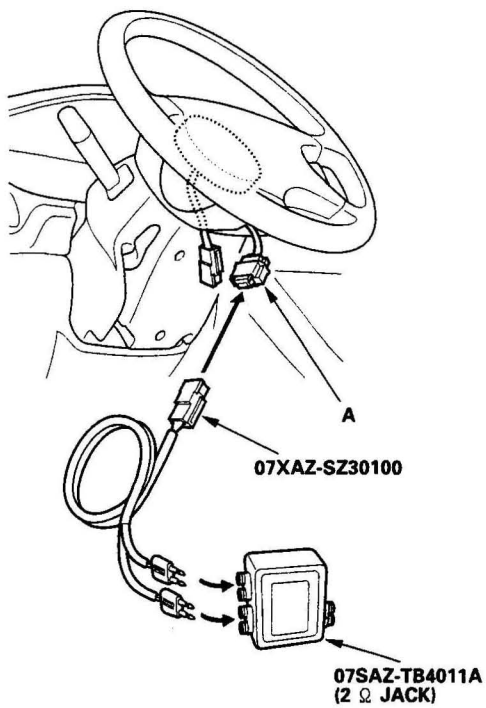
DTC 1-3: Short to another wire or decreased resistance in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator light stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 4P connector from the cable reel 4P connector (A).



5. Connect the special tool (2 Ω) to the cable reel 4P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-3 indicated?

   YES – Go to step 9.

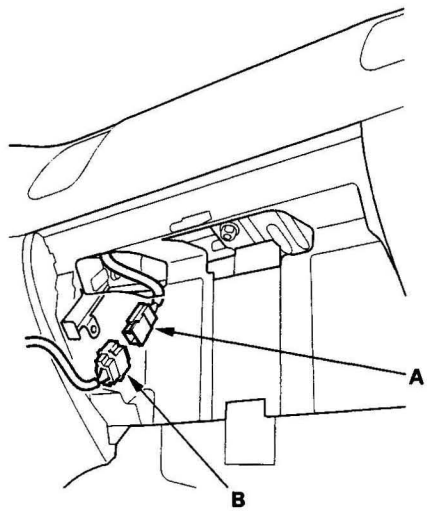
   NO – Short in the driver's airbag; replace the driver's airbag (see page 23-219). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

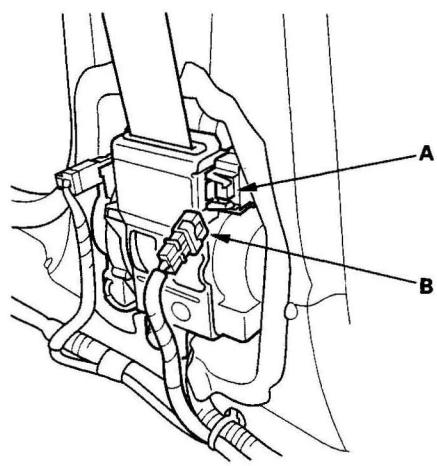
Protected by AR

DTC Troubleshooting (cont'd)

10. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B).

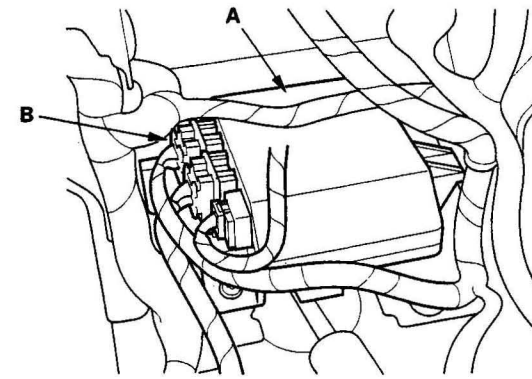


11. Disconnect both seat belt tensioner 2P connectors (A) from the side wire harness 2P connectors (B).



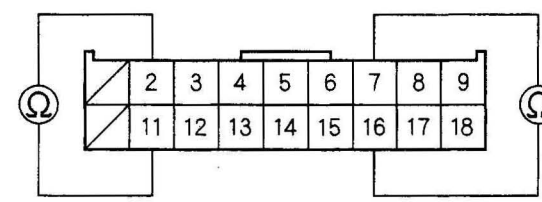
12. Disconnect the special tool (2 Ω) from the cable reel 4P connector.

13. Disconnect SRS unit connector B (18P) from the SRS unit (A).



14. Check resistance between the No. 7 and the No. 16 terminals, and between the No. 2 and No. 11 terminals of SRS unit connector B (18P). There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit.■

NO—Short in the SRS main harness or cable reel; replace the SRS main harness or cable reel.■

BACK

Protected by AR

'02-03 Models

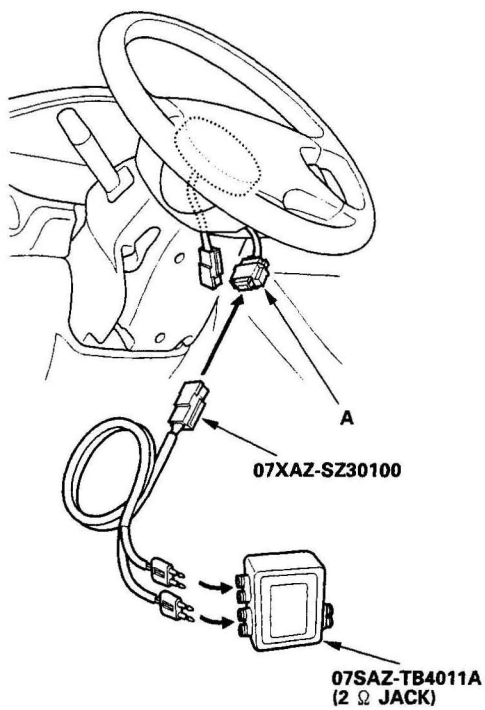
DTC 1-4: Short to power in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 4P connector from the cable reel 4P connector (A).



5. Connect the special tool (2 Ω) to the cable reel 4P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the driver's airbag; replace the driver's airbag (see page 23-219). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.

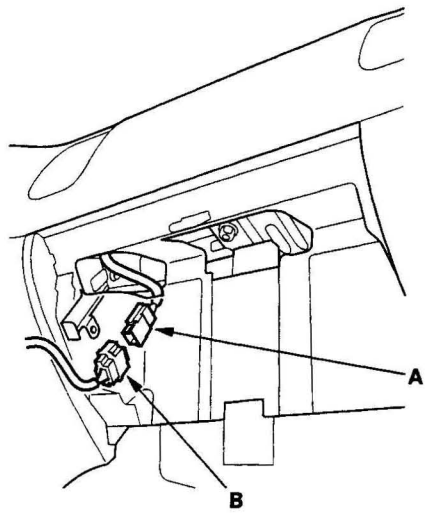
(cont'd)

BACK

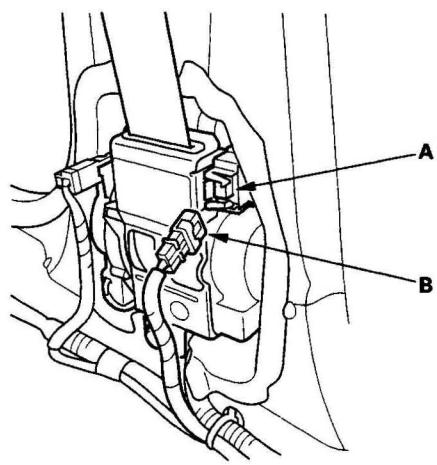
Protected by AR

DTC Troubleshooting (cont'd)

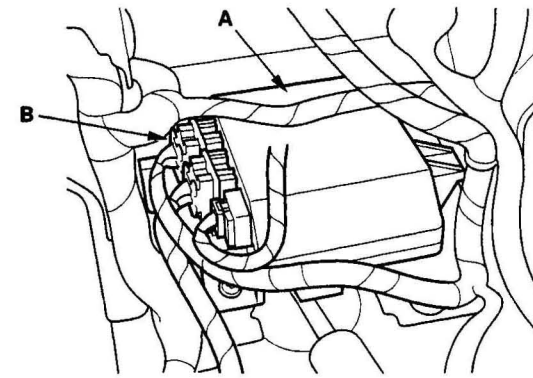
10. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B), and disconnect the special tool (2 Ω) from the cable reel 4P connector.



11. Disconnect both seat belt tension 2P connectors (A) from the side wire harness 2P connector (B).



12. Disconnect SRS unit connector B (18P) from the SRS unit (A).

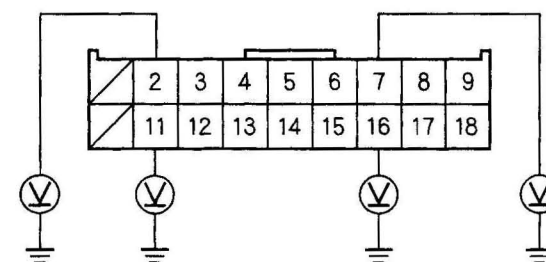


13. Reconnect the battery negative cable.

14. Turn the ignition switch ON (II).

15. Check for voltage between the No. 7 terminal of SRS unit connector B (18P) and body ground, between the No. 16 terminal and body ground, between the No. 2 terminal and body ground, and between the No. 11 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit.■

NO—Short to power in the SRS main harness or cable reel; replace the SRS main harness or cable reel.■

BACK

Protected by AR

'02-03 Models

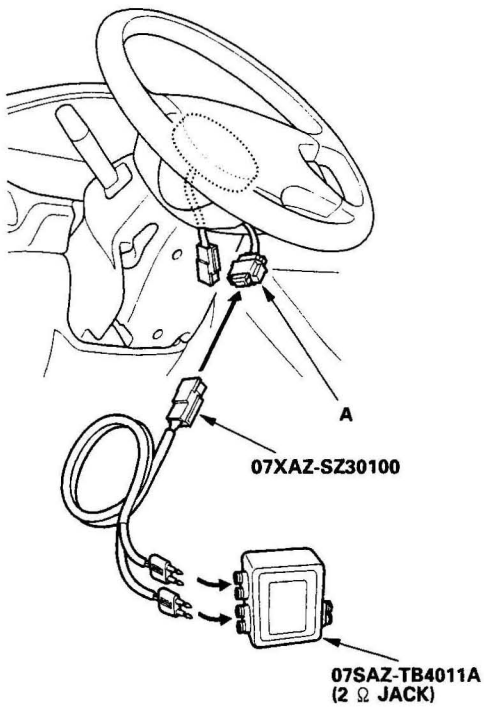
DTC 1-5: Short to ground in driver's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 2P connector from the cable reel 2P connector (A).



5. Connect the special tool (2 Ω) to the cable reel 4P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-5 indicated?

   YES – Go to step 9.

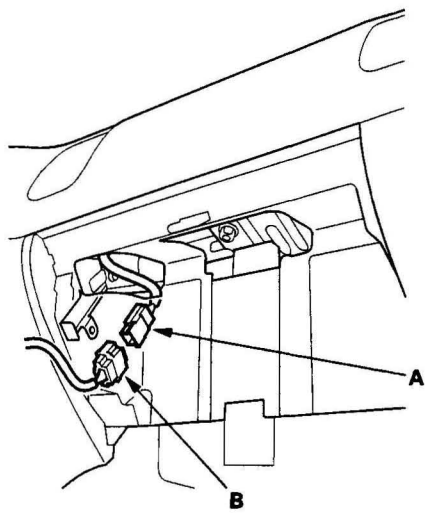
   NO – Short to ground in the driver's airbag inflator; replace the driver's airbag (see page 23-219). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

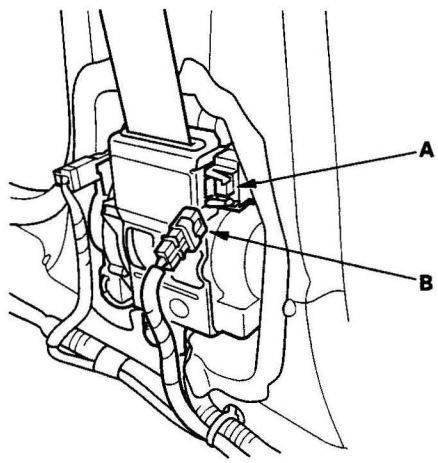
Protected by AR

DTC Troubleshooting (cont'd)

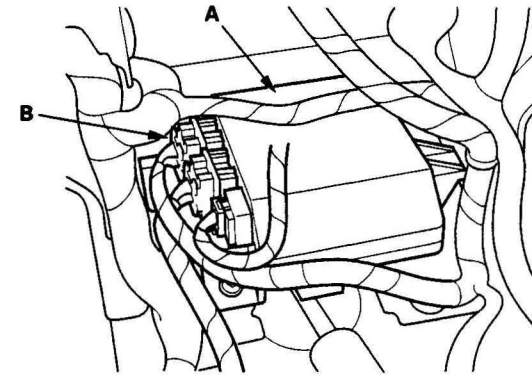
10. Disconnect the front passenger's airbag 4P connector (A) from the SRS main harness 4P connector (B), and disconnect the special tool (2 Ω) from the cable reel 4P connector.



11. Disconnect both seat belt tensioner 2P connectors (A) from the side wire harness 2P connectors (B).

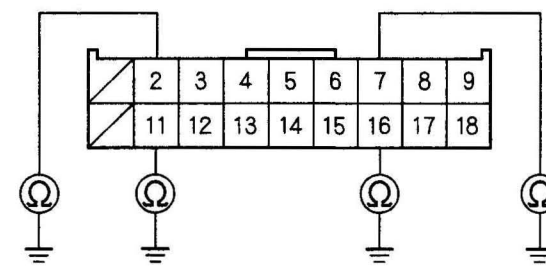


12. Disconnect SRS unit connector B (18P) from the SRS unit (A).



13. Check resistance between the No. 7 terminal of SRS unit connector B (18P) and body ground, between the No. 16 terminal and body ground, between the No. 2 terminal and body ground, and between No. 11 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Open or increased resistance in the SRS main harness or the cable reel; replace the cable reel. If the problem is still present, replace the SRS main harness. ■

BACK

Protected by AR

'02-03 Models

DTC 2-1: Open in passenger's airbag inflator

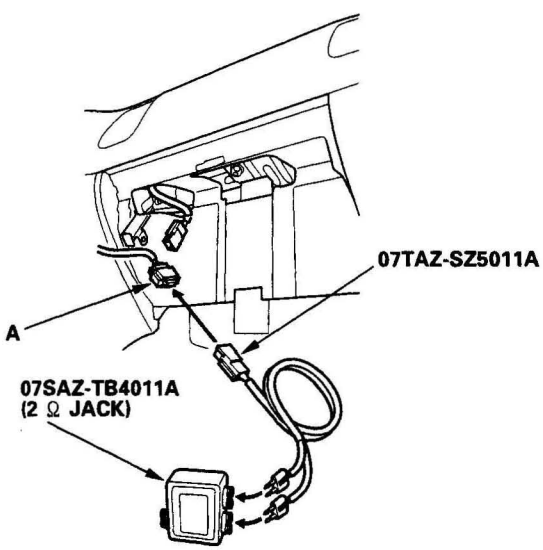
DTC 2-2: Increased resistance in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).



5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-1 or 2-2 indicated?

   YES – Go to step 9.

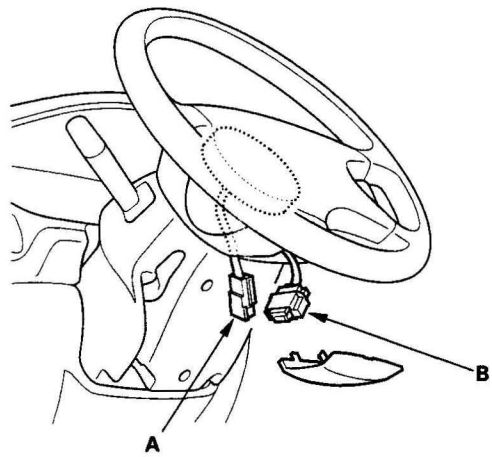
   NO – Open or increased resistance in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-221). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

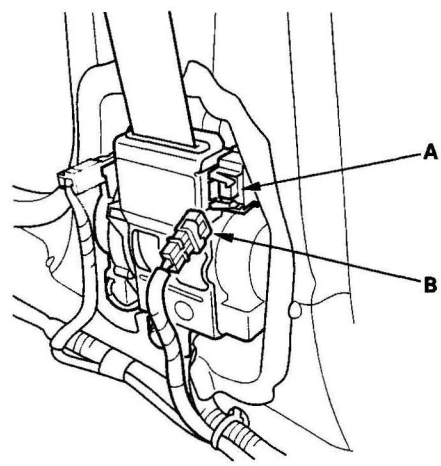
Protected by AR

DTC Troubleshooting (cont'd)

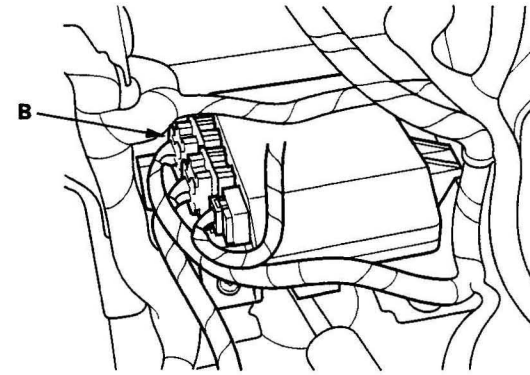
10. Disconnect the driver's airbag 4P connector (A) from the cable reel 4P connector (B).



11. Disconnect both seat belt tensioner 2P connectors (A) from the side wire harness 2P connectors (B).

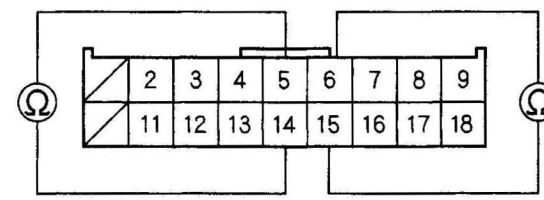


12. Disconnect SRS unit connector (B) (18P) from the SRS unit.



13. Check resistance between the No. 6 and No. 15 terminals and between the No. 5 and No. 14 terminals of SRS unit connector (B) (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at the SRS unit connector; check the connection between the SRS unit connector and the SRS unit.If the connector is OK, replace the SRS unit (see page 23-237).■

NO—Open or increased resistance in the SRS main harness; replace the SRS main harness.■

BACK

Protected by AR

'02-03 Models

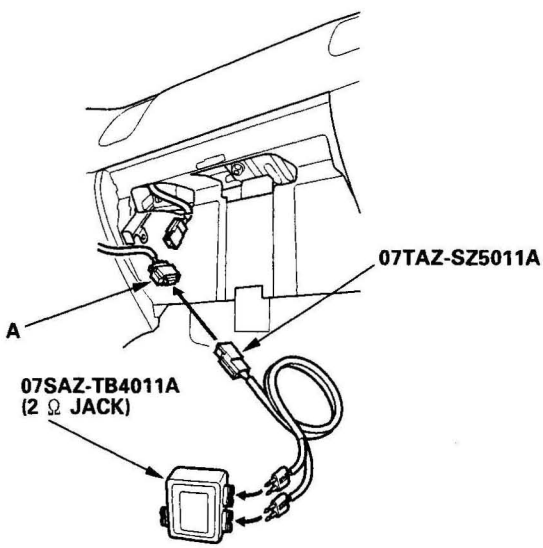
DTC 2-3: Short to another wire or decreased resistance in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).



5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-3 indicated?

   YES – Go to step 9.

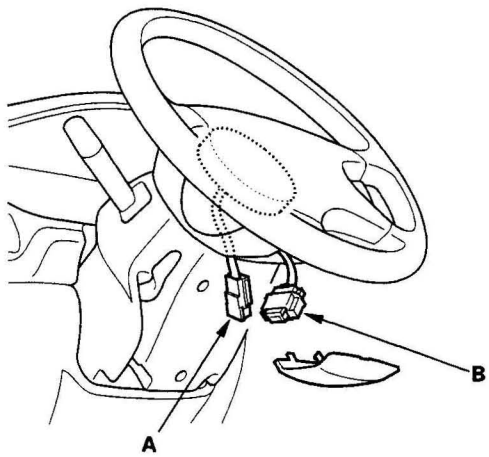
   NO – Short in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-221). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

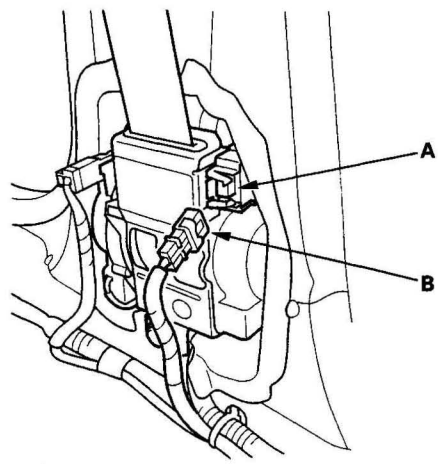
Protected by AR

DTC Troubleshooting (cont'd)

10. Disconnect the driver's airbag 4P connector (A) from the cable reel 4P connector (B).

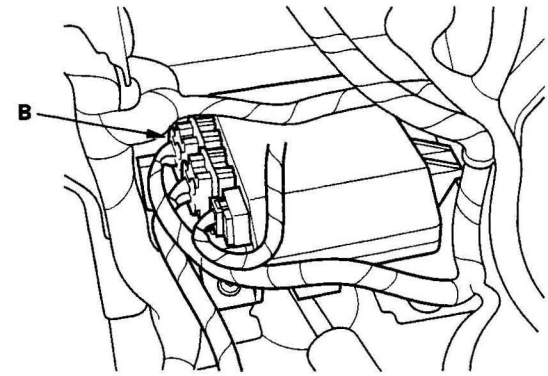


11. Disconnect both seat belt tensioner 2P connectors (A) from the side wire harness 2P connectors (B).



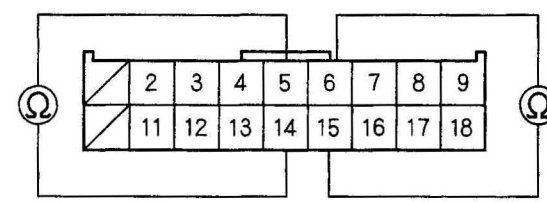
12. Disconnect the special tool (2 Ω) from the SRS main harness 2P connector.

13. Disconnect SRS unit connector (B) (18P) from the SRS unit.



14. Check resistance between the No. 6 and No. 15 terminals and between the No. 5 and No. 14 terminals of SRS unit connector (B) (18P). There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-237).■

NO—Short in the SRS main harness; replace the SRS main harness.■

BACK

Protected by AR

'02-03 Models

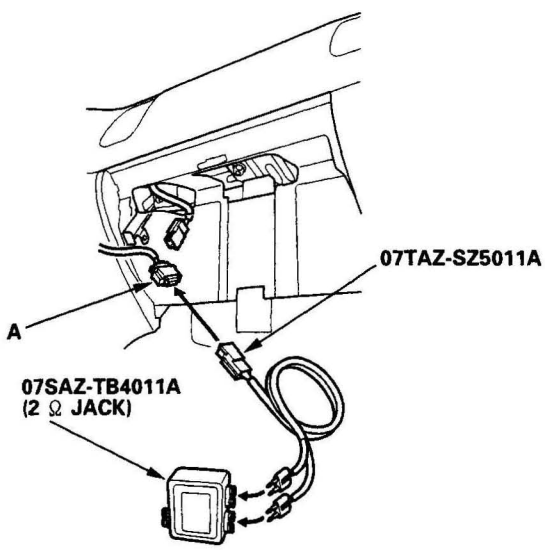
DTC 2-4: Short to power in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector from the SRS main harness 4P connector (A).



5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-221).
9. Disconnect the battery negative cable, and wait for 3 minutes.

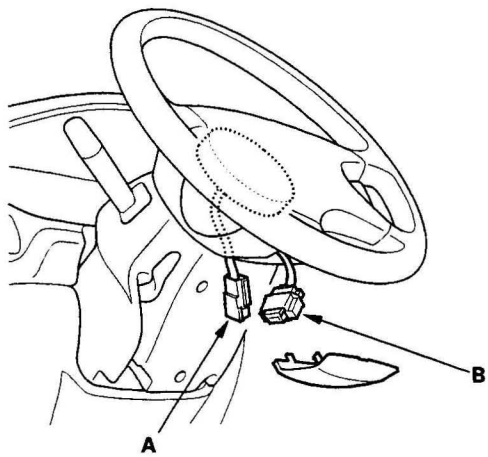
(cont'd)

BACK

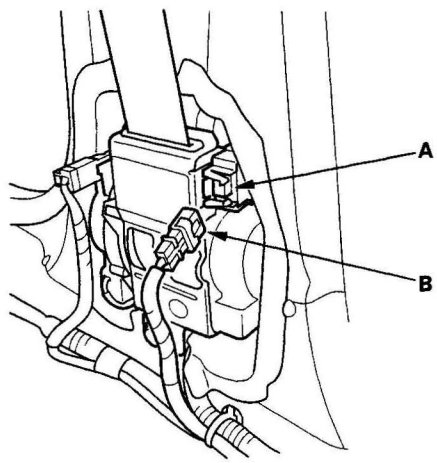
Protected by AR

DTC Troubleshooting (cont'd)

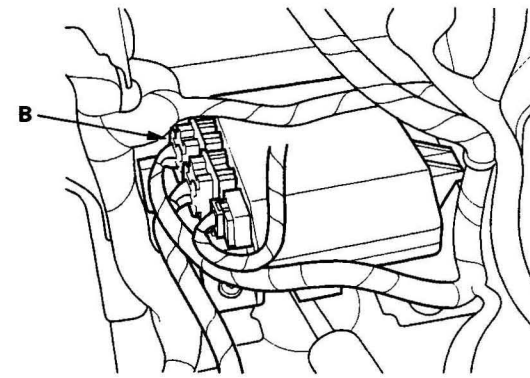
10. Disconnect the driver's airbag 4P connector (A) from the cable reel 4P connector (B), and disconnect the special tool (2 Ω) from the SRS main harness 4P connector.



11. Disconnect both seat belt tensioner 2P connectors (A) from the side wire harness 2P connectors (B).



12. Disconnect SRS unit connector (B) (18P) from the SRS unit.

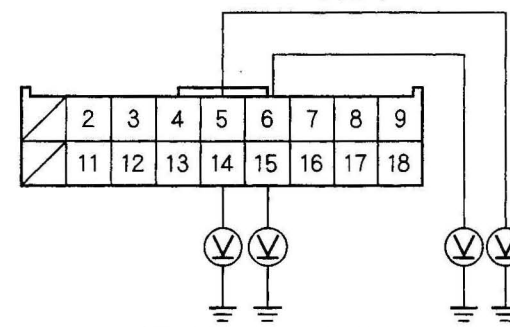


13. Reconnect the battery negative cable.

14. Turn the ignition switch ON (II).

15. Check for voltage between the No. 6 terminal of SRS unit connector (B) (18P) and body ground, and the No. 15 terminal and body ground, the No. 5 terminal and body ground, and between the No. 14 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO—Short to power in the SRS main harness; replace the SRS main harness. ■

BACK

Protected by AR

'02-03 Models

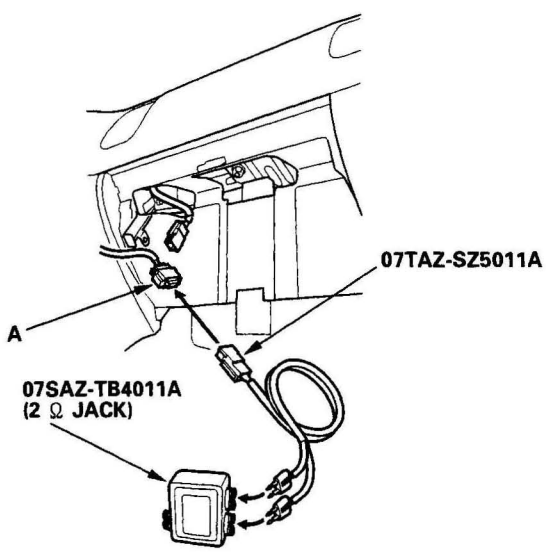
DTC 2-5: Short to ground in passenger's airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds,and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 2P connector from the SRS main harness 2P connector (A).



5. Connect the special tool (2 Ω) to the SRS main harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-5 indicated?

   YES – Go to step 9.

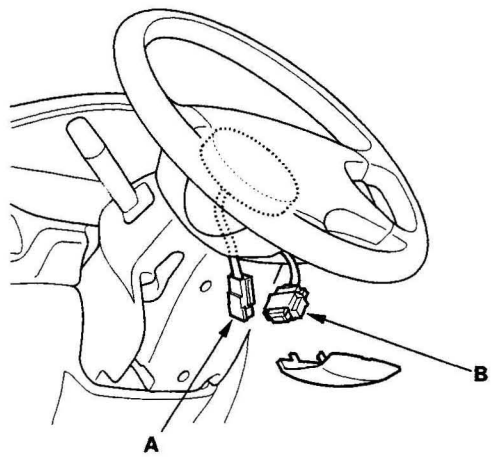
   NO – Short to ground in the passenger's airbag inflator; replace the passenger's airbag (see page 23-221).■
9. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

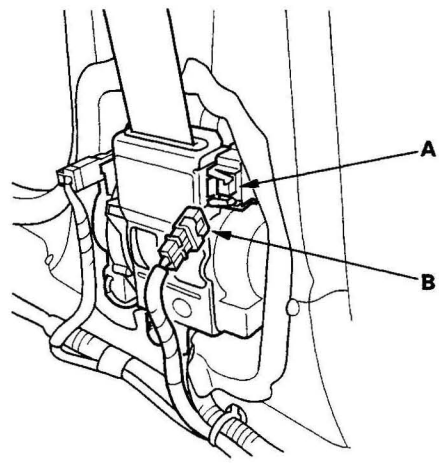
Protected by AR

DTC Troubleshooting (cont'd)

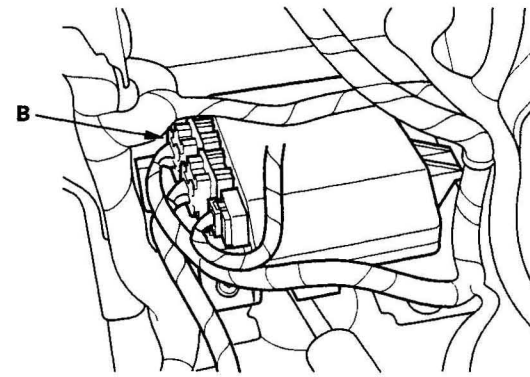
10. Disconnect the driver's airbag 4P connector (A) from the cable reel 4P connector (B), and disconnect the special tool (2 Ω) from the SRS main harness 2P connector.



11. Disconnect both seat belt tensioner 2P connectors (A) from the side wire harness 2P connectors (B).

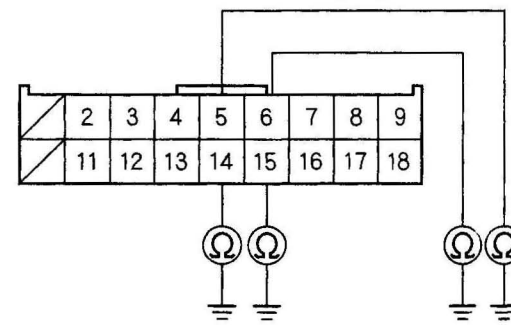


12. Disconnect SRS unit connector (B) (18P) from the SRS unit.



13. Check resistance between the No. 6 terminal of SRS unit connector (B) (18P) and body ground, the No. 15 terminal and body ground, the No. 5 terminal and body ground, and between the No. 14 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-237).■

NO—Short to ground in the SRS main harness; replace the SRS main harness.■

BACK

Protected by AR

'02-03 Models

DTC 3-1: Open in driver's seat belt tensioner

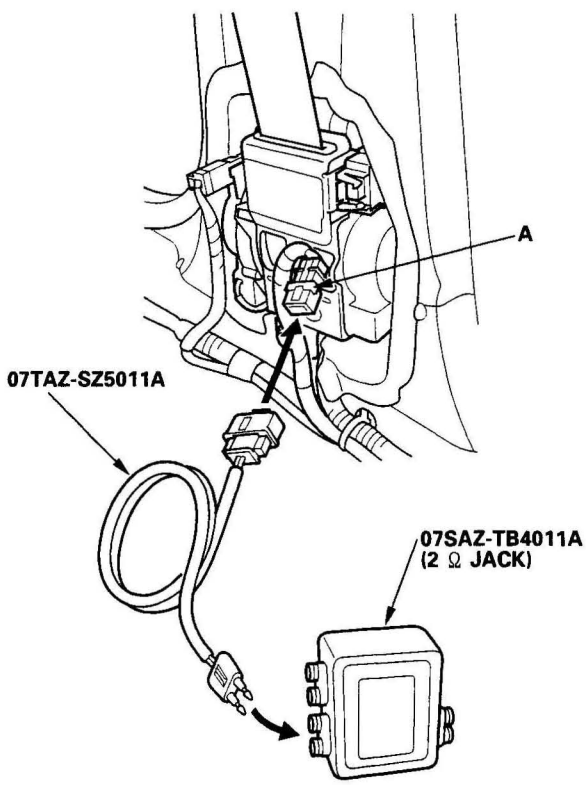
DTC 3-2: Increased resistance in driver's seat belt tensioner

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector from the left side wire harness 2P connector (A).

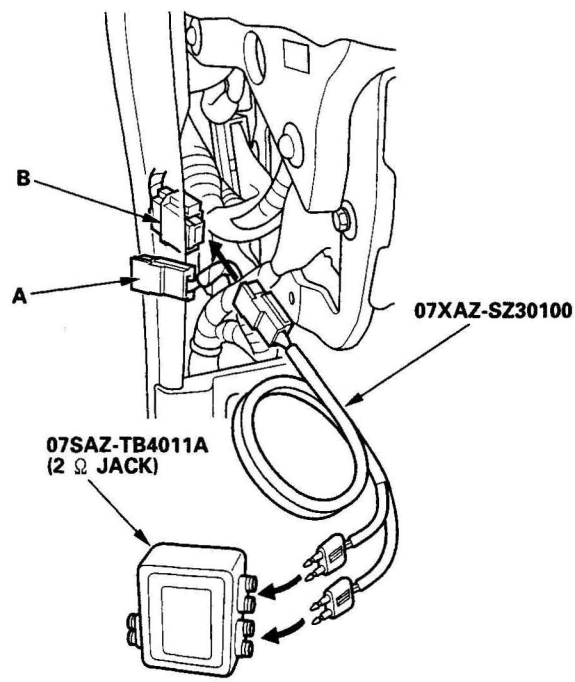


5. Connect the special tool (2 Ω) to the left side wire harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-1 or DTC 3-2 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the left side wire harness 4P connector C556 (A) from the dashboard wire harness A 4P connector (B).



11. Connect the special tool (2 Ω) to the dashboard wire harness A 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

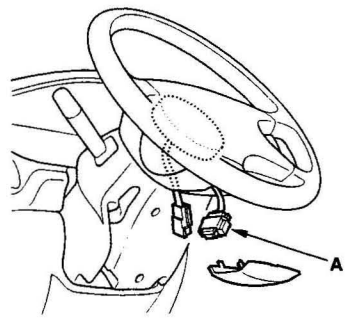
    Is DTC 3-1 or DTC 3-2 indicated?

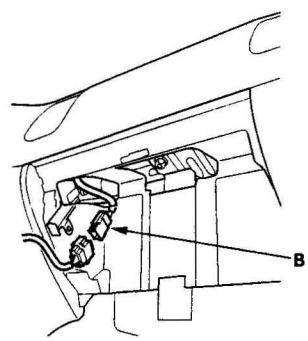
    YES – Go to step 15.

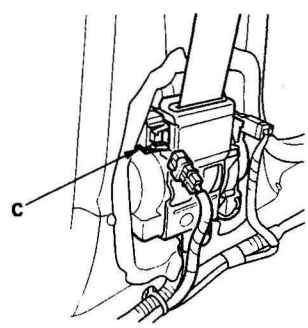
    NO – Open or increased resistance in left side wire harness; replace the left side wire harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

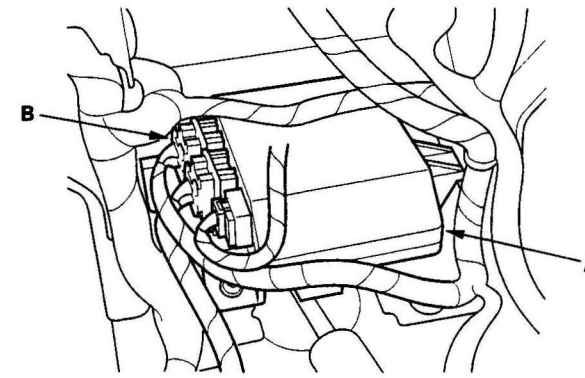
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and front passenger's seat belt tensioner connector (C).





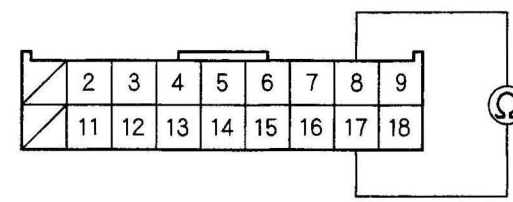


17. Disconnect the SRS unit connector B (18P) from the SRS unit (A).



18. Check resistance between the No. 8 terminal and the No. 17 terminal of SRS unit connector B (18P). There should be 2.0 – 3.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit or poor contact at SRS unit connector B (18P) and the SRS unit. Check the connection between the connector and the SRS unit. If the connection is OK, replace the SRS unit. ■

NO – Open or increased resistance in the SRS main harness or dashboard wire harness A; replace the faulty harness. ■

BACK

Protected by AR

'02-03 Models

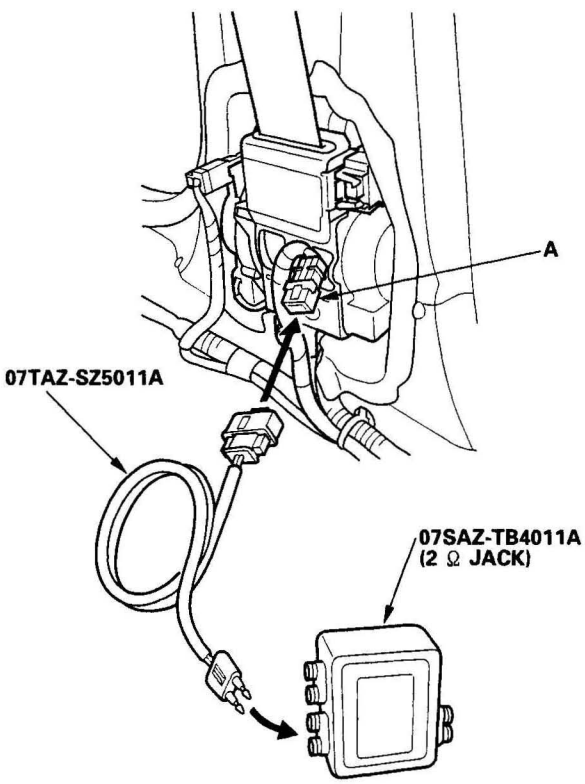
DTC 3-3: Short to another wire or decreased resistance in driver's seat belt tensioner

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector from the left side wire harness 2P connector (A).

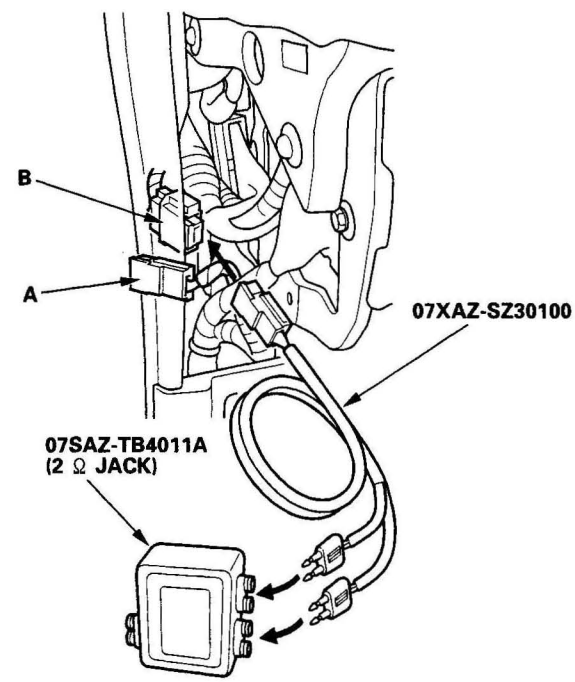


5. Connect the special tool (2 Ω) to the left side wire harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-3 indicated?

   YES – Go to step 9.

   NO – Short in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the left side wire harness 4P connector C556 (A) from the dashboard wire harness A 4P connector (B).



11. Connect the special tool (2 Ω) to the dashboard wire harness A 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

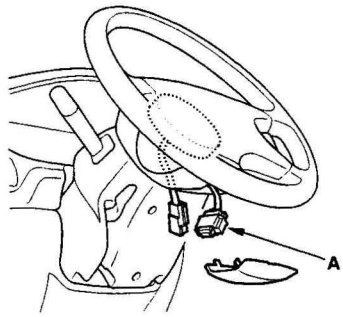
    Is DTC 3-3 indicated?

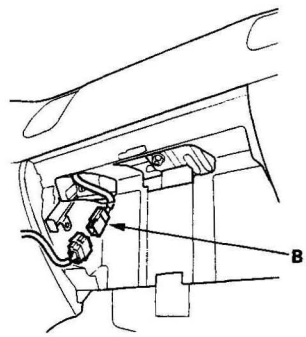
    YES – Go to step 15.

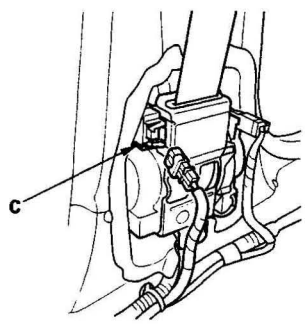
    NO – Short in left side wire harness; replace the left side wire harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

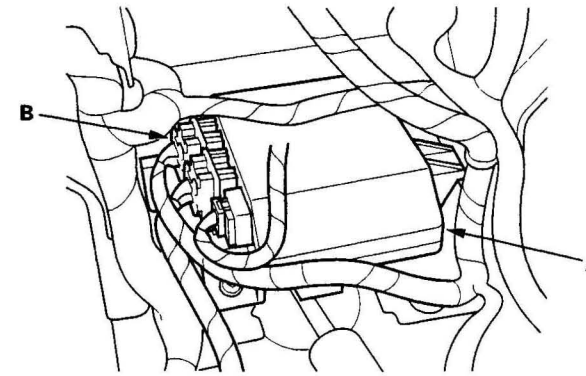
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and front passenger's seat belt tensioner connector (C).







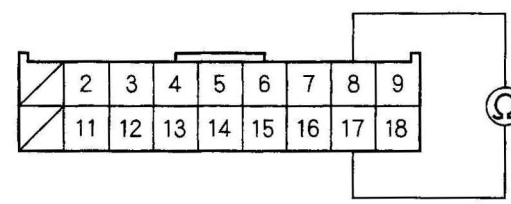
17. Disconnect SRS unit connector B (18P) from the SRS unit (A).



18. Disconnect the special tool (2 Ω) from the dashboard wire harness A 4P connector.

19. Check resistance between the No. 8 terminal and the No. 17 terminal of the SRS unit connector B (18P). There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short in the SRS main harness or dashboard wire harness A; replace the faulty harness. ■

BACK

Protected by AR

'02-03 Models

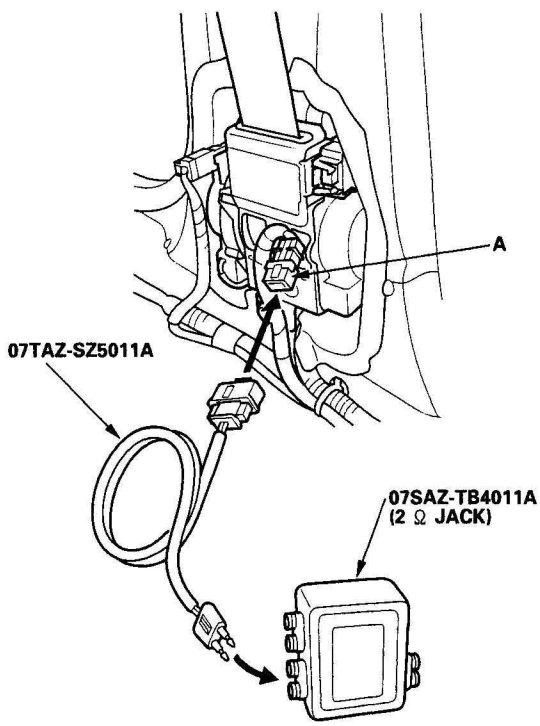
DTC 3-4: Short to power in driver's seat belt tensioner

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector from the left side wire harness 2P connector (A).

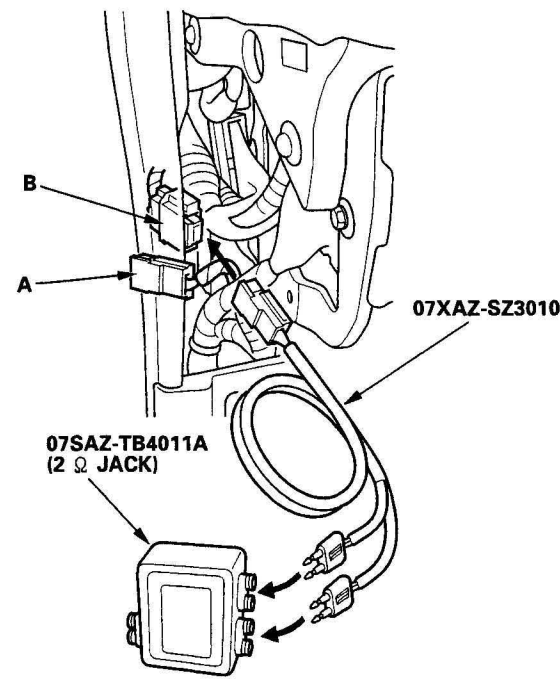


5. Connect the special tool (2 Ω) to the left side wire harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-4 indicated?

   YES – Go to step 9.

   NO – Short to power in driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the left side wire harness 4P connector C556 (A) from the dashboard wire harness A 4P connector (B).



11. Connect the special tool (2 Ω) to the dashboard wire harness A 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

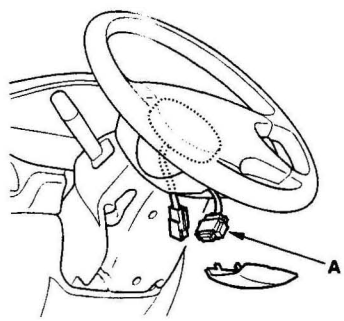
    Is DTC 3-4 indicated?

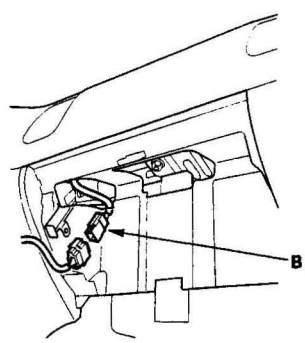
    YES – Go to step 15.

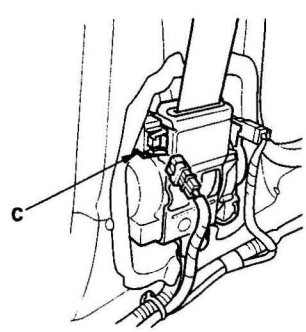
    NO – Short to power in the left side wire harness; replace the left side wire harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

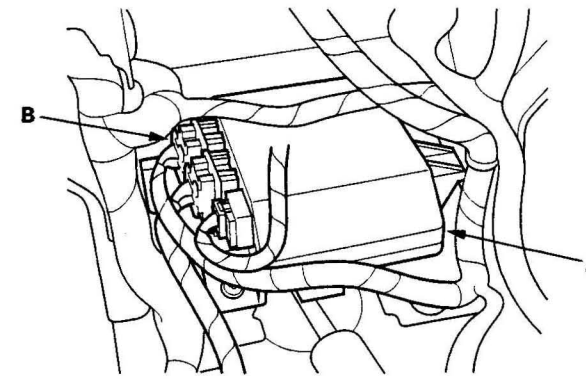
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and front passenger's seat belt tensioner connector (C).







17. Disconnect SRS unit connector B (18P) from the SRS unit (A).



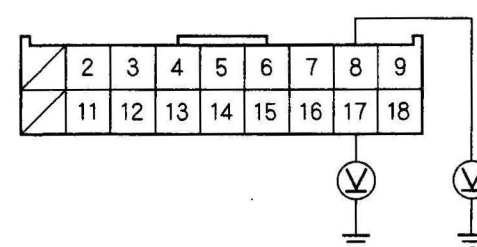
18. Disconnect the special tool (2 Ω) from the dashboard wire harness A 4P connector.

19. Reconnect the battery negative cable.

20. Turn the ignition switch ON (II).

21. Check for voltage between the No. 8 terminal of SRS unit connector B (18P) and body ground, and between the No. 17 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to power in the SRS main harness or dashboard wire harness A; replace the faulty harness. ■

BACK

Protected by AR

'02-03 Models

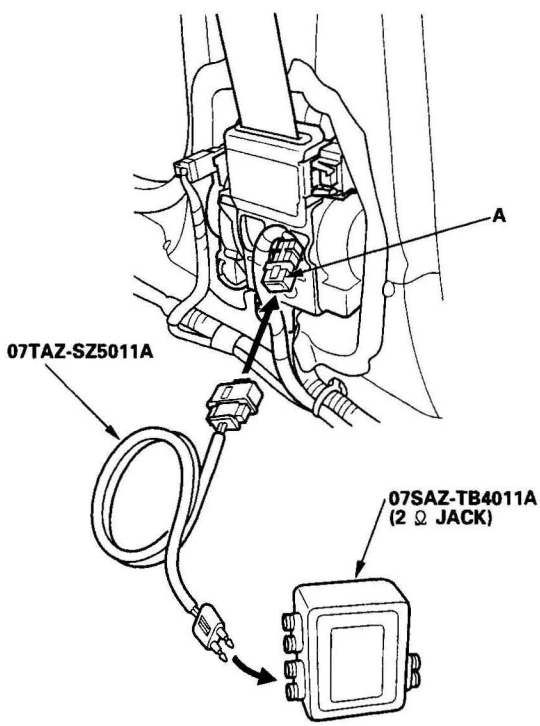
DTC 3-5: Short to ground in driver's seat belt tensioner

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector from the left side wire harness 2P connector (A).

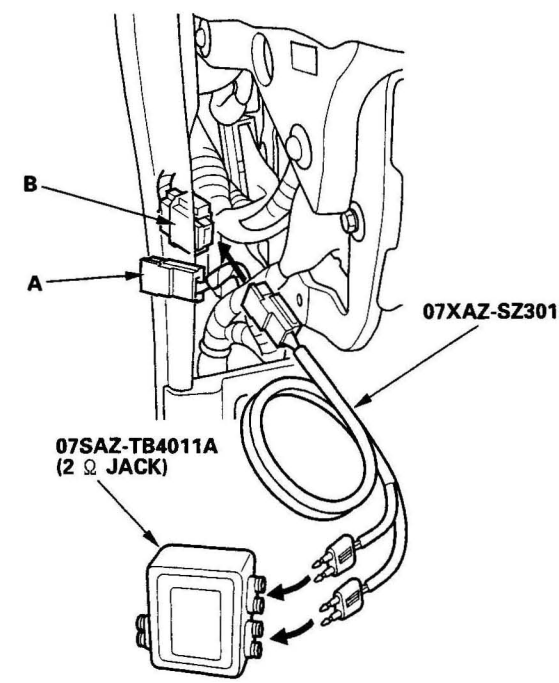


5. Connect the special tool (2 Ω) to the left side wire harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-5 indicated?

   YES – Go to step 9.

   NO – Short to ground in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the left side wire harness 4P connector C556 (A) from the dashboard wire harness A 4P connector (B).



11. Connect the special tool (2 Ω) to the dashboard wire harness A 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

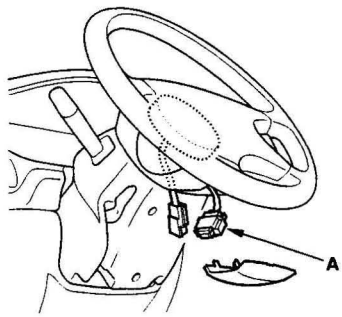
    Is DTC 3-5 indicated?

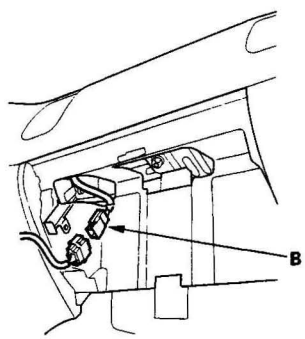
    YES – Go to step 15.

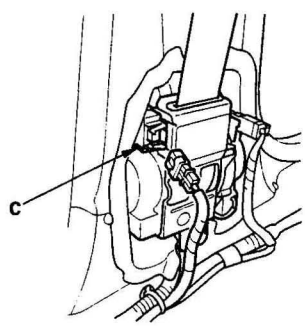
    NO – Short to ground in the left side wire harness; replace the left side wire harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

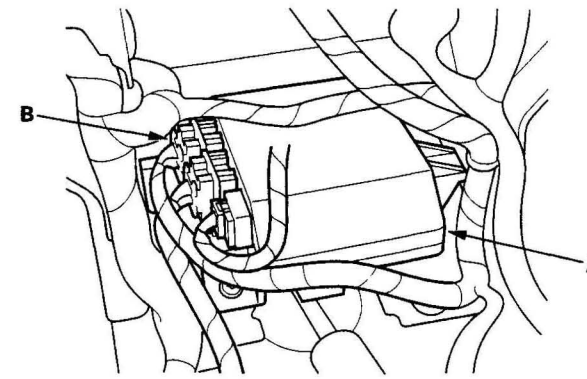
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and front passenger's seat belt tensioner connector (C).







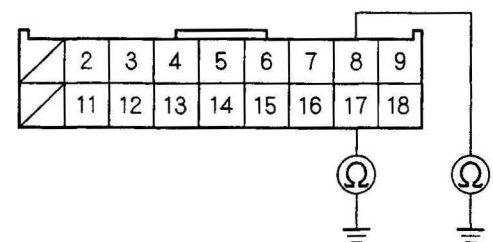
17. Disconnect SRS unit connector B (18P) from the SRS unit (A).



18. Disconnect the special tool (2 Ω) from the dashboard wire harness A 4P connector.

19. Check resistance between the No. 8 terminal of SRS unit connector B (18P) and body ground, and between the No. 17 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to ground in the SRS main harness or dashboard wire harness A; replace the faulty harness. ■

BACK

Protected by AR

'02-03 Models

DTC 4-1: Open in front passenger's seat belt tensioner

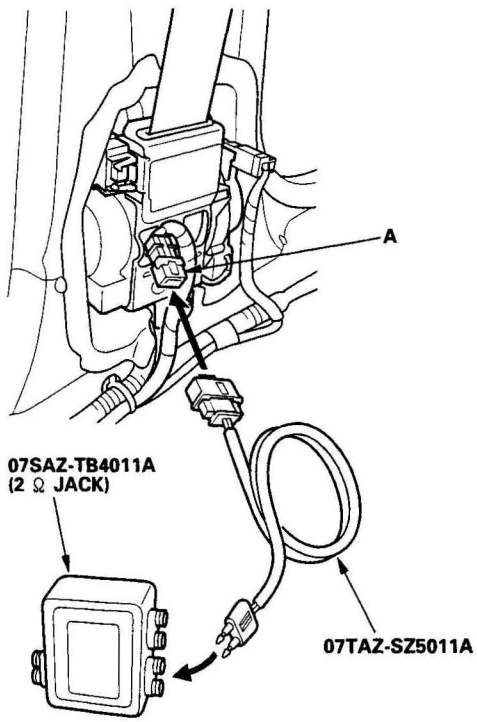
DTC 4-2: Increased resistance in front passenger's seat belt tensioner

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt tensioner 2P connector from the right side wire harness 2P connector (A).

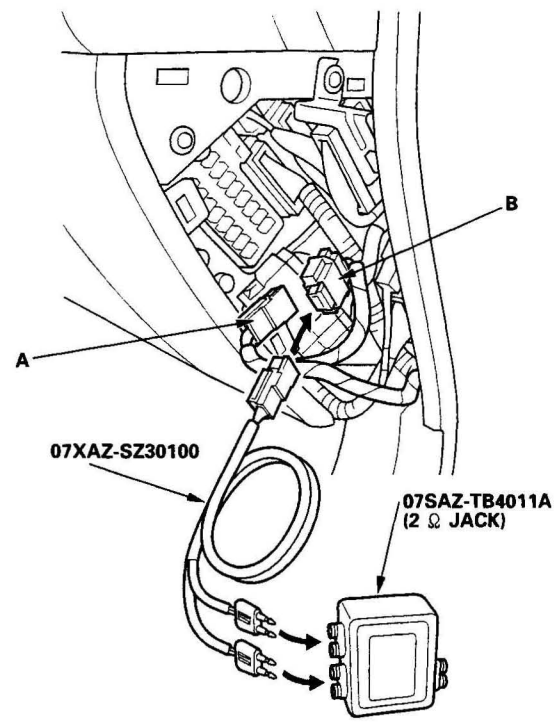


5. Connect the special tool (2 Ω) to the right side wire harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-1 or DTC 4-2 indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the right side wire harness 4P connector C502 (A) from the dashboard wire harness A 4P connector (B).



11. Connect the special tool (2 Ω) to the dashboard wire harness A 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

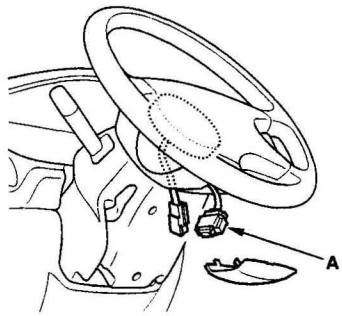
    Is DTC 4-1 or DTC 4-2 indicated?

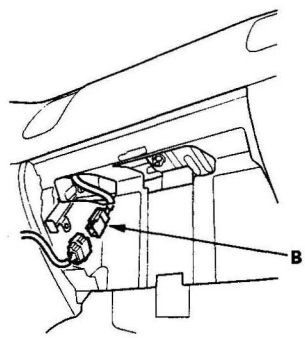
    YES – Go to step 15.

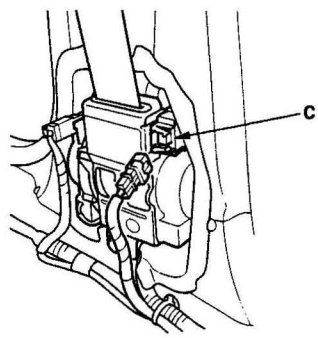
    NO – Open or increased resistance in the right side wire harness; replace the right side wire harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

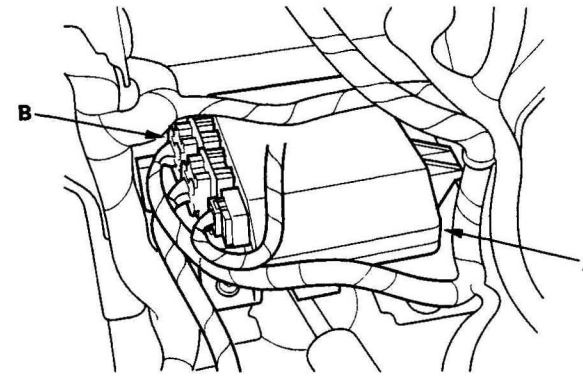
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and driver's seat belt tensioner connector (C).





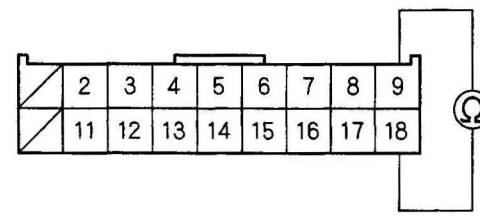


17. Disconnect SRS unit connector B (18P) from the SRS unit (A).



18. Check resistance between the No. 9 terminal and the No. 18 terminal of SRS unit connector B (18P). There should be 2.0 – 3.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit or poor contact at SRS unit connector B (18P) and the SRS unit. Check the connection between the connector and the SRS unit. If the connection is OK, replace the SRS unit. ■

NO – Open or increased resistance in the SRS main harness or dashboard wire harness A; replace the faulty harness. ■

BACK

Protected by AR

'02-03 Models

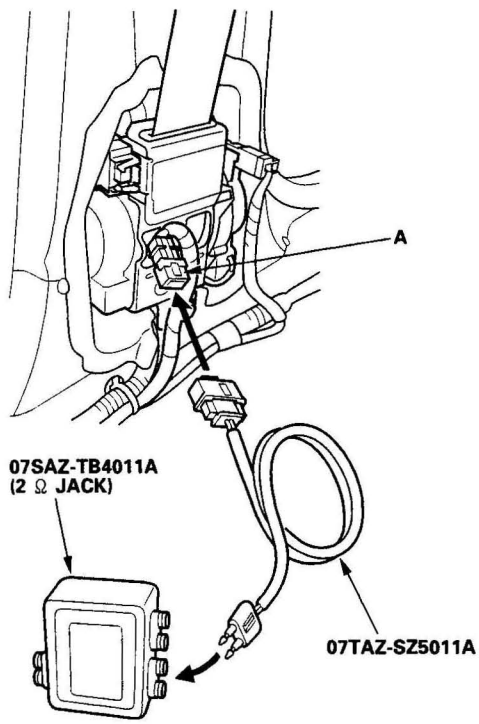
DTC 4-3: Short to another wire or decreased resistance in front passenger's seat belt tensioner

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt tensioner 2P connector from the right side wire harness 2P connector (A).

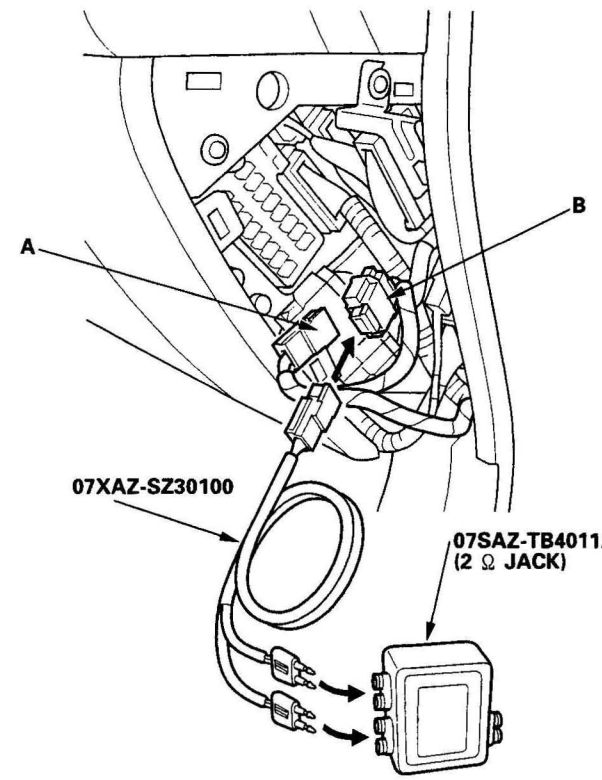


5. Connect the special tool (2 Ω) to the right side wire harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-3 indicated?

   YES – Go to step 9.

   NO – Short in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the right side wire harness 4P connector C502 (A) from the dashboard wire harness A 4P connector (B).



11. Connect the special tool (2 Ω) to the dashboard wire harness A 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

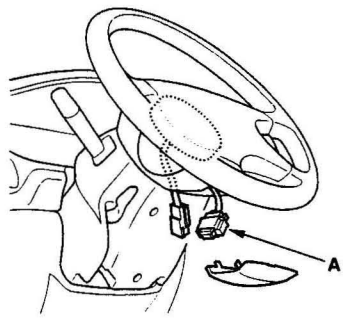
    Is DTC 4-3 indicated?

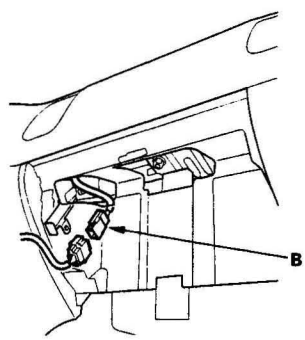
    YES – Go to step 15.

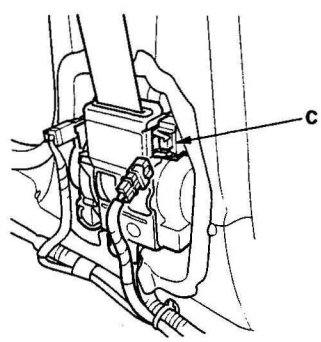
    NO – Short in the right side wire harness; replace the right side wire harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

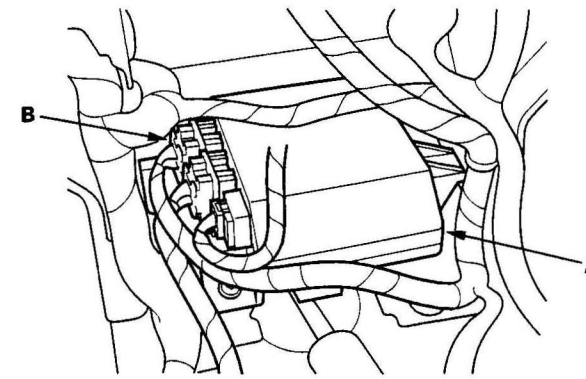
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and driver's seat belt tensioner connector (C).







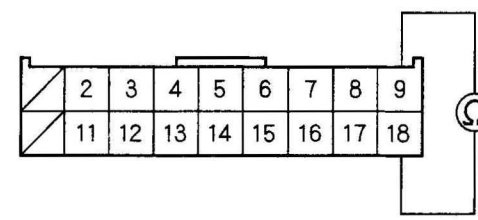
17. Disconnect SRS unit connector B (18P) from the SRS unit (A).



18. Disconnect the special tool (2 Ω) from the dashboard wire harness A 4P connector.

19. Check resistance between the No. 9 terminal and the No. 18 terminal of SRS unit connector B (18P). There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short in the SRS main harness or dashboard wire harness A; replace the faulty harness. ■

BACK

Protected by AR

'02-03 Models

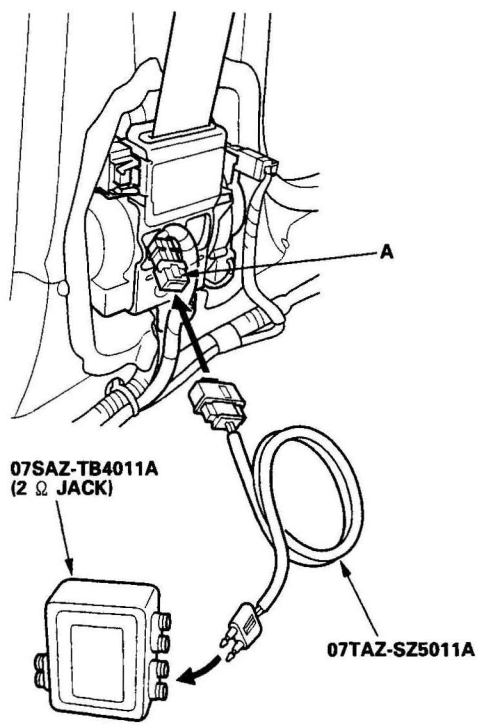
DTC 4-4: Short to power in front passenger's seat belt tensioner

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt tensioner 2P connector from the right side wire harness 2P connector (A).

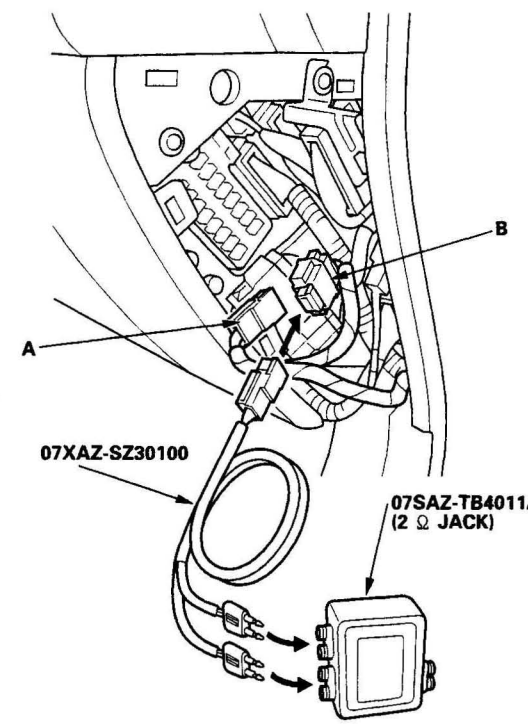


5. Connect the special tool (2 Ω) to the right side wire harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for three minutes.
10. Disconnect the right side wire harness 4P connector C502 (A) from the dashboard wire harness A 4P connector (B).



11. Connect the special tool (2 Ω) to the dashboard wire harness A 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

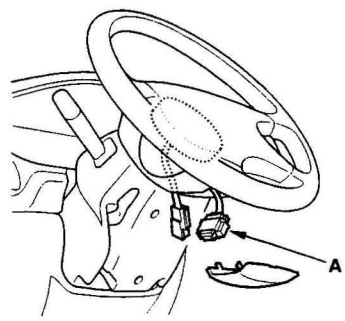
    Is DTC 4-4 indicated?

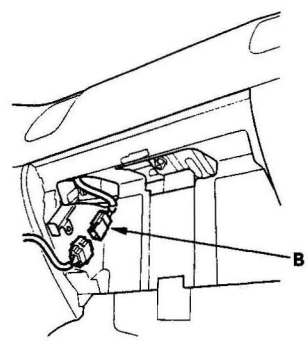
    YES – Go to step 15.

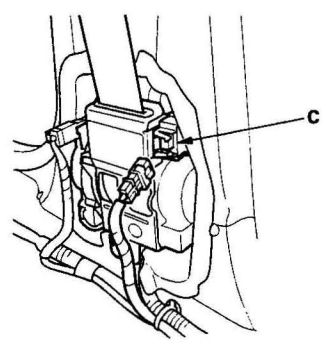
    NO – Short to power in the right side wire harness; replace the right side wire harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

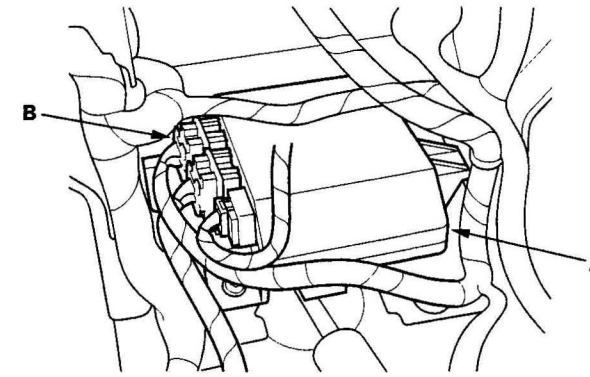
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and driver's seat belt tensioner connector (C).







17. Disconnect SRS unit connector B (18P) from the SRS unit (A).



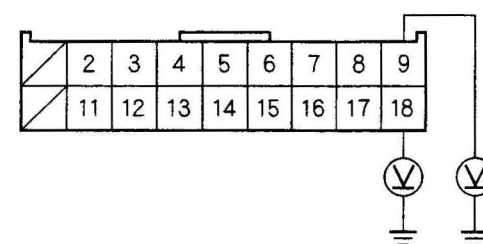
18. Disconnect the special tool (2 Ω) from the dashboard wire harness A 4P connector.

19. Reconnect the battery negative cable.

20. Turn the ignition switch ON (II).

21. Check for voltage between the No. 9 terminal of SRS unit connector B (18P) and body ground, and between the No. 18 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to power in the SRS main harness or dashboard wire harness A; replace the faulty harness. ■

BACK

Protected by AR

'02-03 Models

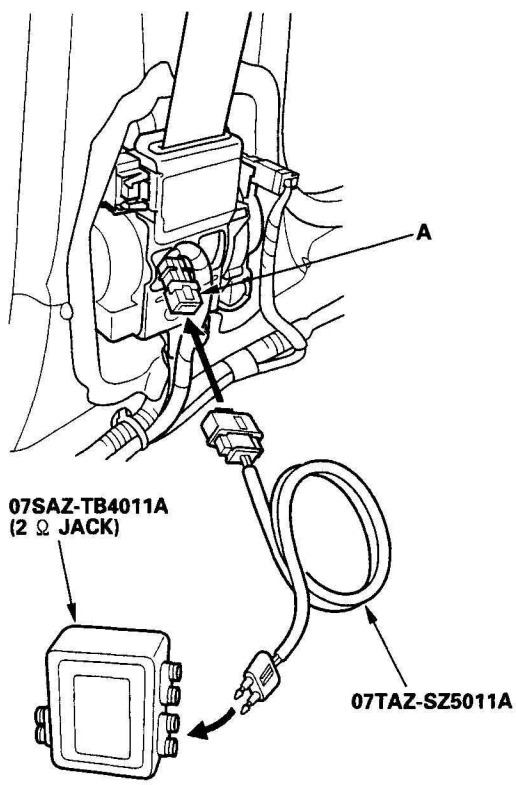
DTC 4-5: Short to ground in front passenger's seat belt tensioner

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt tensioner 2P connector from the right side wire harness 2P connector (A).

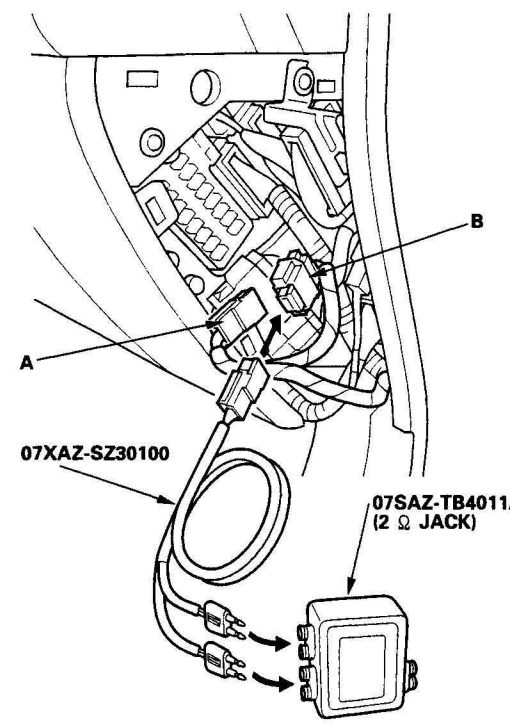


5. Connect the special tool (2 Ω) to the right side wire harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-5 indicated?

   YES – Go to step 9.

   NO – Short to ground in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the right side wire harness 4P connector C502 (A) from the dashboard wire harness A 4P connector (B).



11. Connect the special tool (2 Ω) to the dashboard wire harness A 4P connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

14. Read the DTC.

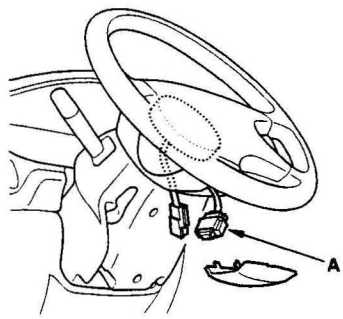
    Is DTC 4-5 indicated?

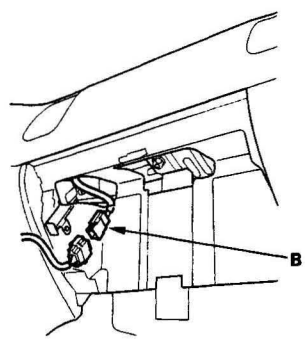
    YES – Go to step 15.

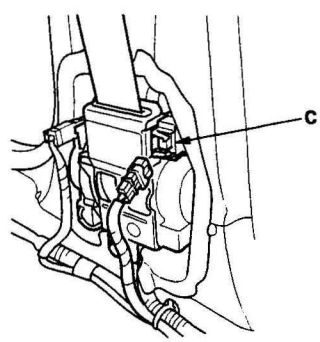
    NO – Short to ground in the right side wire harness; replace the right side wire harness. ■

15. Disconnect the battery negative cable, and wait for 3 minutes.

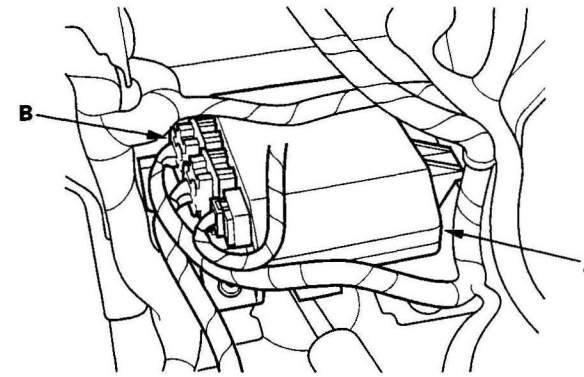
16. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and driver's seat belt tensioner connector (C).







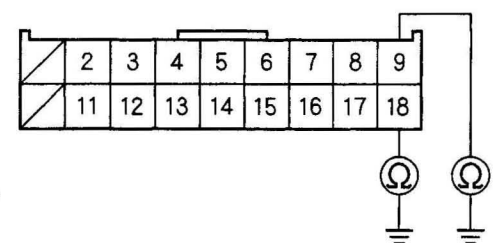
17. Disconnect SRS unit connector B (18P) from the SRS unit (A), and disconnect the special tool (2 Ω) from the SRS main harness 2P connector.



18. Disconnect the special tool (2 Ω) from the dashboard wire harness A 4P connector.

19. Check resistance between the No. 9 terminal of SRS unit connector B (18P) and body ground, and between the No. 18 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to ground in the SRS main harness or dashboard wire harness A; replace the faulty harness. ■

BACK

Protected by AR

'02-03 Models

DTC 5-1, 5-2, 5-3, 5-4, 5-5, 5-8, 6-1, 6-2, 6-3, 6-4, 6-5, 6-6, 6-7, 6-8, 7-1, 7-2, 7-3, 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 8-7, 8-8, 9-1, 9-2, 13-5, 14-5 :
Internal failure of the SRS unit

Note: Before troubleshooting any of these DTCs, check battery/system voltage. If voltage is low, repair the charging system before troubleshooting the SRS system. If the battery/system voltage are OK now, ask the customer if the battery ever went dead.

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Replace the SRS unit (see page 23-237).

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

'02-03 Models

DTC 10-1, 10-2, 10-3, 10-4, 10-5, 10-6, 10-7:
Airbags and/or side airbags deployed

The SRS unit must be replaced after any airbags have deployed (see page 23-237).

Protected by AR

DTC Troubleshooting (cont'd)

'02-03 Models

DTC 13-4, 14-4: Faulty power supply to the side impact sensor

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Replace the SRS floor harness. ■

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

BACK

Protected by AR

'02-03 Models

DTC 9-3: Faulty driver's seat belt buckle switch

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), then buckle and unbuckle the driver's seat belt several times.
3. Read the DTC.

   Is DTC 9-3 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
4. Check the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse blown?

   YES—Go to step 5.

   NO—Go to step 6.
5. Replace the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box, and turn the ignition on for 30 seconds.

   Did the fuse blow again?

   YES—Locate and repair the short to ground on the No. 9 fuse circuit, and clear the DTC.■

   NO—Go to step 6.
6. Turn the ignition switch OFF.
7. Disconnect the driver's power seat wire harness 3P connector (A) from the driver's seat belt buckle switch 3P connector (B).

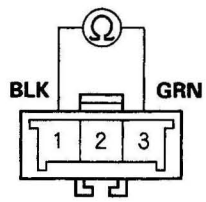


8. Buckle the driver's seat belt.

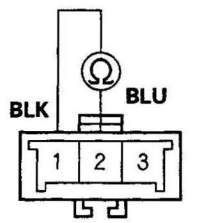
   Check resistance between the No. 1 and No. 3 terminals of the driver's seat belt buckle switch 3P connector. There should be 0—1 Ω.

   Check resistance between the No. 1 and No. 2 terminals of the same connector. There should be an open circuit, or at least 1 MΩ.

DRIVER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

Are the resistance readings as specified?

YES—Go to step 9.

NO—Replace the driver's seat belt buckle assembly, and clear the DTC.■

(cont'd)

Protected by AR

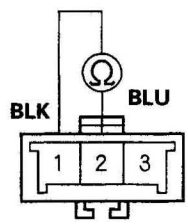
DTC Troubleshooting (cont'd)

9. Unbuckle the driver's seat belt.

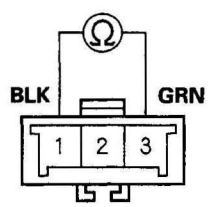
   Check resistance between the No. 1 and No. 2 terminals of the driver's seat belt buckle switch 3P connector. There should be 0 — 1 Ω.

   Check resistance between the No. 1 and No. 3 terminals of the same connector. There should be an open circuit, or at least 1 MΩ.

DRIVER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

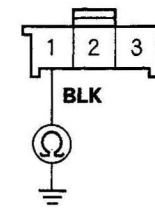
Are the resistance readings as specified?

YES — Go to step 10.

NO — Replace the driver's seat belt buckle assembly, and clear the DTC. ■

10. Check resistance between the No. 1 terminal of the driver's power seat wire harness 3P connector and body ground. There should be 0 — 1 Ω.

DRIVER'S POWER SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

YES — Go to step 11.

NO — Open in the driver's power seat wire harness, open in the left side wire harness, or poor ground connection at G551. If G551 is OK, replace the faulty harness. ■

11. Turn the ignition switch ON (II).

Does the seat belt reminder stay on?

YES — Go to step 16.

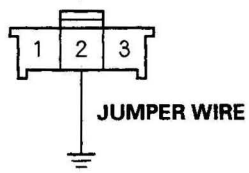
NO — Go to step 12.

BACK

Protected by AR

12. Connect the No. 2 terminal of the driver's power seat wire harness 3P connector to body ground with a jumper wire.

DRIVER'S POWER SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Does the seat belt reminder come on?

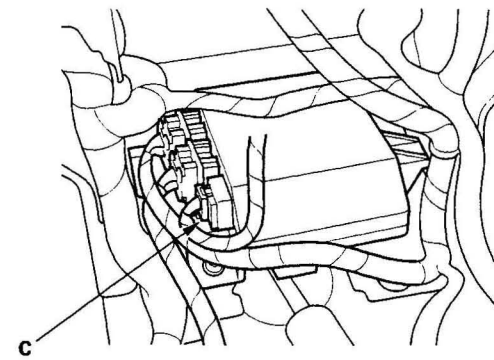
YES – Go to step 13.

NO – Open in the driver's power seat wire harness, left side wire harness, or driver's under-dash fuse/relay box, or dashboard wire harness A. Isloate the faulty harness, and replace the harness or component as necessary. ■

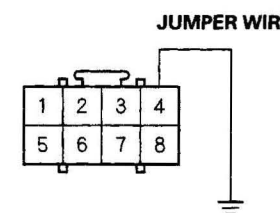
13. Turn the ignition switch OFF, disconnect the negative cable from the battery, then wait at least 3 minutes.

14. Disconnect all SRS unit connectors, and reconnect the battery.

15. Connect the No. 4 terminal of SRS unit connector C (8P) to body ground with a jumper wire. Turn the ignition switch ON (II).



SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

Does the seat belt reminder come on?

YES – Go to step 18.

NO – Open in dashboard wire harness A. Replace dashboard wire harness A. ■

16. Turn the ignition switch OFF, disconnect the negative cable from the battery, then wait at least 3 minutes.

17. Disconnect all SRS unit connectors, reconnect the battery, then turn the ignition switch ON (II).

Does the seat belt reminder come on?

YES – Short to ground in the dashboard wire harness A, driver's under-dash fuse/relay box, driver's multiplex control unit, left side wire harness, driver's power seat wire harness, or gauge assembly/circuit board. Replace the faulty harness or component. ■

NO – Replace the SRS unit. ■

(cont'd)

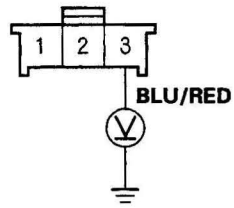
BACK

Protected by AR

DTC Troubleshooting (cont'd)

18. Measure the voltage between the No. 3 terminal of the driver's power seat wire harness 3P connector and body ground.

DRIVER'S POWER SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

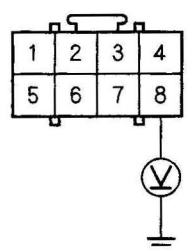
Is there battery voltage?

YES – Go to step 19.

NO – Go to step 20.

19. Measure the voltage between the No. 8 terminal of SRS unit connector C (8P) and body ground.

SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

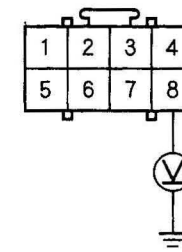
Is there battery voltage?

YES – Replace the SRS unit. ■

NO – Open in the dashboard wire harness A, or left side wire harness. Replace the faulty wire harness. ■

20. Measure voltage between the No. 8 terminal of SRS unit connector C (8P) and body ground.

SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

Is there battery voltage?

YES – Open in the driver's power seat wire harness, or left side wire harness. Replace the faulty wire harness. ■

NO – Go to step 21.

21. Turn the ignition switch OFF.

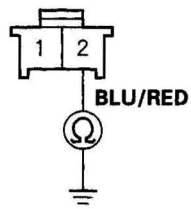
22. Disconnect the driver's tension reducer solenoid 2P connector.

BACK

Protected by AR

23. Check for continuity between the No. 2 terminal of the driver's tension reducer solenoid 2P connector and body ground.

DRIVER'S TENSION REDUCER SOLENOID 2P CONNECTOR



Wire side of female terminals

Is there continuity?

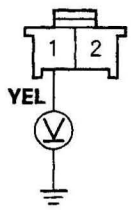
YES – Short to ground in the dashboard wire harness A, left side wire harness, or driver's power seat wire harness. Replace the faulty harness. ■

NO – Go to step 24.

24. Turn the ignition switch ON (II).

25. Measure voltage between the No. 1 terminal of the driver's tension reducer solenoid 2P connector and body ground.

DRIVER'S TENSION REDUCER SOLENOID 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Short to ground in the driver's tension reducer solenoid. Replace the solenoid. ■

NO – Open in the left side wire harness or driver's under-dash fuse/relay box. Replace the faulty harness or driver's under-dash fuse/relay box. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'02-03 Models

DTC 9-4: Faulty front passenger's seat belt buckle switch

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), then buckle and unbuckle the front passenger's seat belt several times.
3. Read the DTC.

   Is DTC 9-4 indicated?

   YES – Go to step 4.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
4. Check the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse blown?

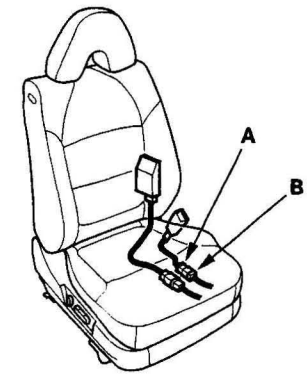
   YES – Go to step 5.

   NO – Go to step 6.
5. Replace the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box, then turn the ignition on for 30 seconds.

   Did the fuse blow again?

   YES – Locate and repair the short to ground on the No. 9 fuse circuit, and clear the DTC.■

   NO – Go to step 6.
6. Turn the ignition switch OFF.
7. Disconnect the front passenger's seat belt buckle switch 3P connector (A) from the front passenger's power seat wire harness 3P connector (B).

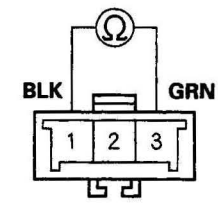


8. Buckle the front passenger's seat belt.

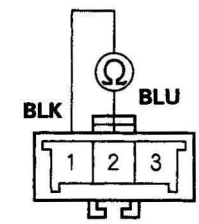
   Check resistance between the No. 1 and No. 3 terminals of the front passenger's seat belt buckle switch 3P connector. There should be 0 – 1 Ω.

   Check resistance between the No. 1 and No. 2 terminals of the same connector. There should be an open circuit, or at least 1 MΩ.

DRIVER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

Are the resistance readings as specified?

YES – Go to step 9.

NO – Replace the front passenger's seat belt buckle assembly, and clear the DTC.■

BACK

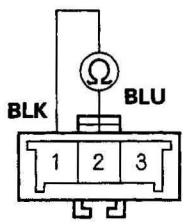
Protected by AR

9. Unbuckle the front passenger's seat belt.

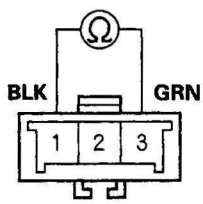
   Check resistance between the No. 1 and No. 2 terminals of the front passenger's seat belt buckle switch 3P connector. There should be 0 – 1 Ω.

   Check resistance between the No. 1 and No. 3 terminals of the same connector. There should be an open circuit, or at least 1 MΩ.

DRIVER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

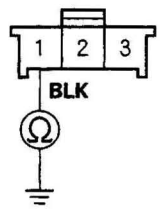
Are the resistance readings as specified?

YES – Go to step 10.

NO – Replace the front passenger's seat belt buckle assembly, and clear the DTC. ■

10. Check resistance between the No. 1 terminal of the passenger's power seat wire harness 3P connector and body ground. There should be 0 – 1 Ω.

PASSENGER'S POWER SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

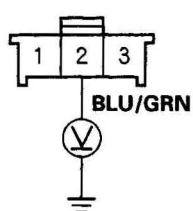
YES – Go to step 11.

NO – Open in the passenger's power seat wire harness, open in the right side wire harness, or poor ground connection at G581. If G581 is OK, replace the faulty harness. ■

11. Turn the ignition switch ON (II).

12. Measure voltage between the No. 2 terminal of the passenger's power seat harness 3P connector and body ground. There should be 1.0 V or more.

PASSENGER'S POWER SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Is the voltage as specified?

YES – Go to step 13.

NO – Go to step 23.

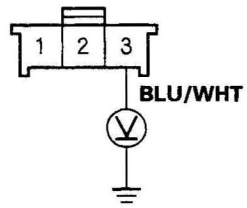
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

13. Measure voltage between the No. 3 terminal of the passenger's power seat 3P connector and body ground.

PASSENGER'S POWER SEAT WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 14.

NO – Go to step 18.

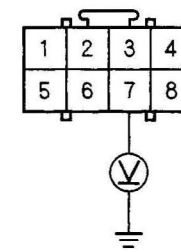
14. Turn the ignition switch OFF, disconnect the negative cable from the battery, and wait at least 3 minutes.

15. Disconnect all SRS unit connectors from the SRS unit.

16. Reconnect the negative cable to the battery, and turn the ignition switch ON (II).

17. Measure voltage between the No. 7 terminal of SRS unit connector C (8P) and body ground.

SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

Is there battery voltage?

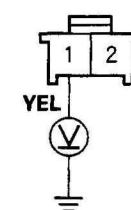
YES – Replace the SRS unit. ■

NO – Open in the dashboard wire harness A, or right side wire harness. Isolate the faulty wire harness, and replace as necessary. ■

18. Disconnect the front passenger's tension reducer solenoid 2P connector.

19. Measure voltage between the No. 1 terminal of the front passenger's tension reducer solenoid 2P connector and body ground.

FRONT PASSENGER'S TENSION REDUCER SOLENOID 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 20.

NO – Open in the right side wire harness or dashboard wire harness A. Isolate the faulty wire harness and replace as necessary. ■

BACK

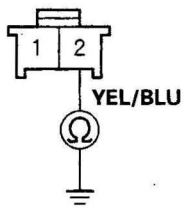
Protected by AR

20. Turn the ignition switch OFF, disconnect the negative cable from the battery, and wait at least 3 minutes.

21. Disconnect all SRS connectors from the SRS unit.

22. Check for continuity between the No. 2 terminal of the front passenger's tension reducer solenoid 2P connector and body ground.

FRONT PASSENGER'S TENSION REDUCER SOLENOID 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES – Short to ground in the passenger's power seat wire harness, right side wire harness or dashboard wire harness A. Isolate the faulty harness, and replace as necessary. ■

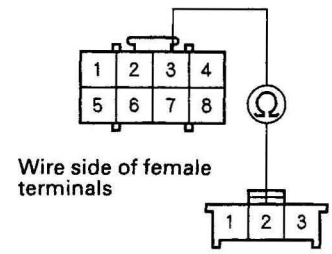
NO – Open in the right side wire harness, passenger's power seat wire harness, short to ground in the front passenger's tension reducer solenoid, or SRS unit. Isolate the faulty wire harness or component, and replace as necessary. ■

23. Turn the ignition switch OFF, disconnect the negative cable from the battery, and wait at least 3 minutes.

24. Disconnect all SRS connectors from the SRS unit.

25. Check for continuity between the No. 3 terminal of SRS unit connector C (8P) and the No. 2 terminal of the passenger's power seat wire harness 3P connector.

SRS UNIT CONNECTOR C (8P)



PASSENGER'S POWER SEAT WIRE HARNESS 3P CONNECTOR

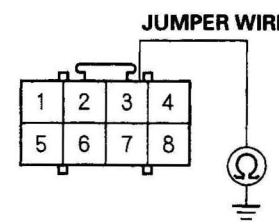
Is there continuity?

YES – Go to step 26.

NO – Open in the dashboard wire harness A, right side wire harness, or passenger's seat wire harness. Isolate the faulty wire harness, and replace as necessary. ■

26. Check for continuity between the No. 3 terminal of SRS unit connector C (8P) and body ground.

SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

Is there continuity?

YES – Short to ground in the dashboard wire harness A, right side wire harness, or the front passenger's power seat wire harness. Isolate the faulty harness, and replace as necessary. ■

NO – Replace the SRS unit. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'02-03 Models

DTC 11-1: Open in driver's side airbag inflator

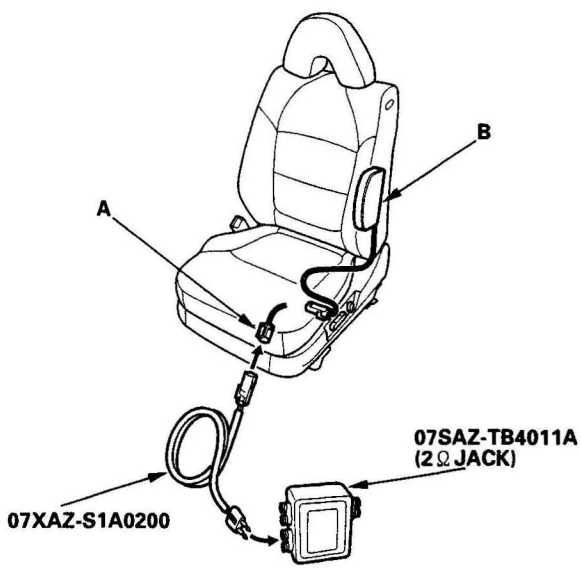
DTC 11-2: Increased resistance in driver's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).

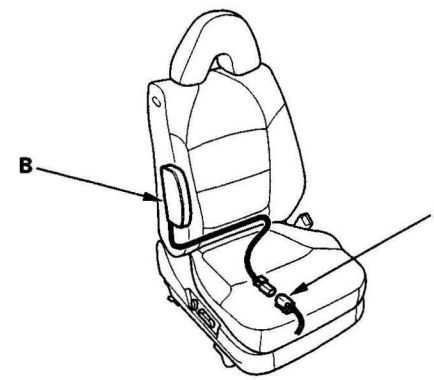


5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

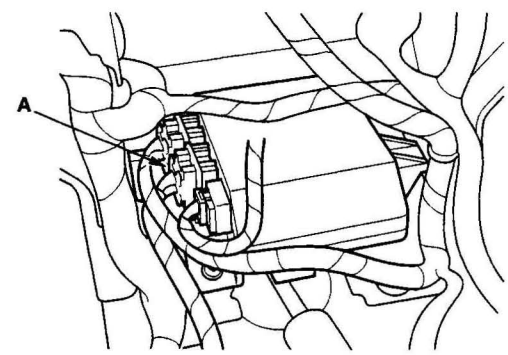
   Is DTC 11-1 or DTC 11-2 Indicated?

   YES – Go to step 9.

   NO – Open or increased resistance in the driver's side airbag inflator; replace the driver's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).



11. Disconnect SRS unit connector (A) (14P) from the SRS unit. Do not disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.

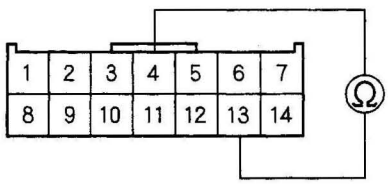


BACK

Protected by AR

12. Check resistance between the No. 4 and No. 13 terminals of SRS unit connector (A) (14P). There should be 2.0–3.0 Ω.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector A (14P) and the SRS unit; check the connection at SRS unit connector A (14P) and SRS unit. If the connector is OK, replace the SRS unit. ■

NO—Open or increased resistance in the SRS floor harness; replace the SRS floor harness. ■

'02-03 Models

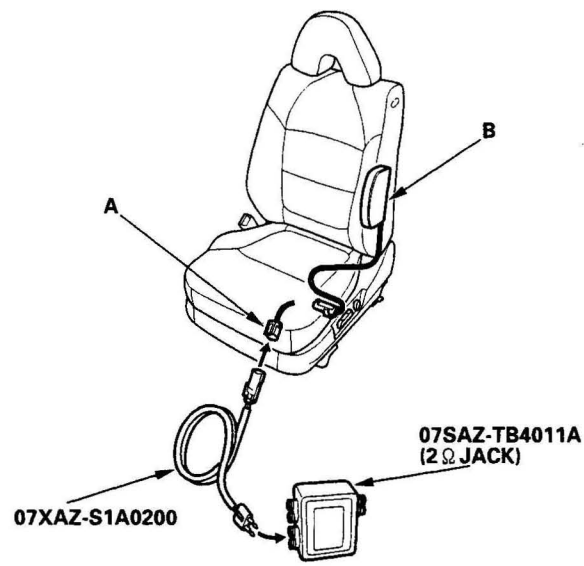
DTC 11-3: Short to another wire or decreased resistance in driver's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).



5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.

(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

8. Read the DTC.

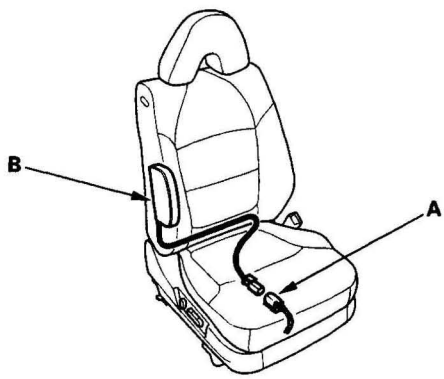
   Is DTC 11-3 indicated?

   YES – Go to step 9.

   NO – Short to another wire in the driver's side airbag inflator; replace the driver's side airbag. ■

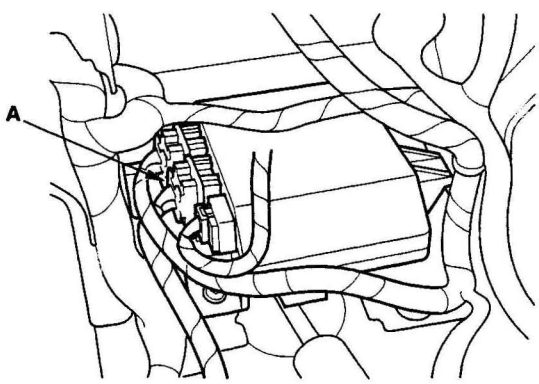
9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).



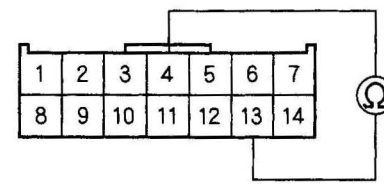
11. Disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.

12. Disconnect SRS unit connector (A) (14P) from the SRS unit.



13. Check resistance between the No. 4 and No. 13 terminals of SRS unit connector A (14P). There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to another wire in the SRS floor harness; replace the SRS floor harness. ■

BACK

Protected by AR

'02-03 Models

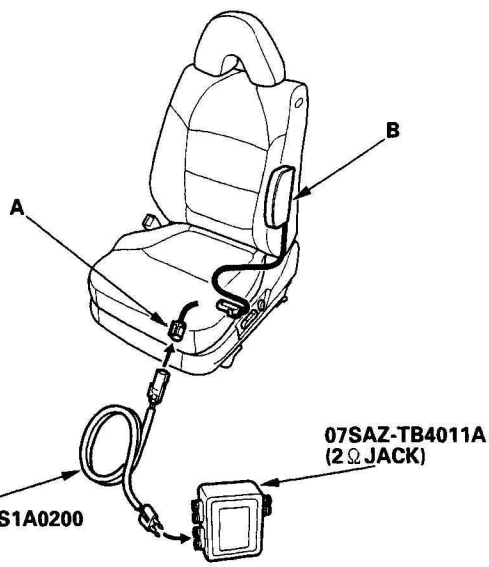
DTC 11-4: Short to power in driver's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).

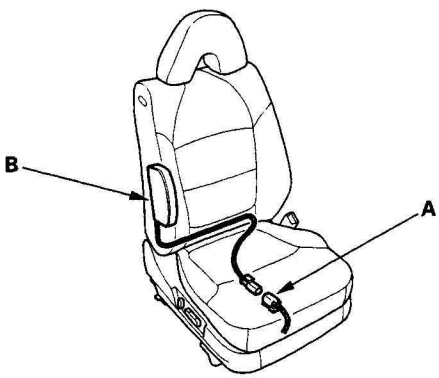


5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

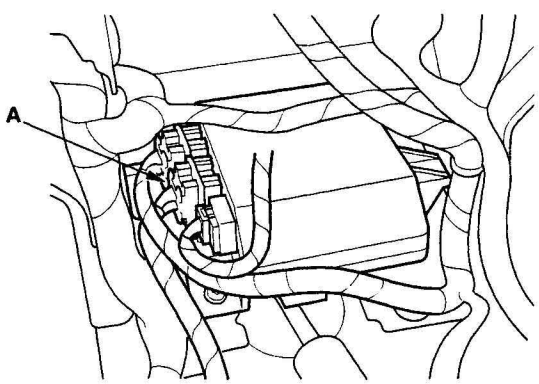
   Is DTC 11-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the driver's side airbag inflator; replace the driver's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes. ■
10. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B), and disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.



11. Disconnect SRS unit connector (A) (14P) from the SRS unit.



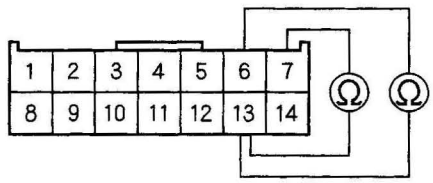
(cont'd)

Protected by AR

DTC Troubleshooting (cont'd)

12. Check resistance between the No. 13 and No. 6 terminals of SRS unit connector A (14P), and between the No. 13 and No. 7 terminals. There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to power in the SRS floor harness; replace the SRS floor harness. ■

'02-03 Models

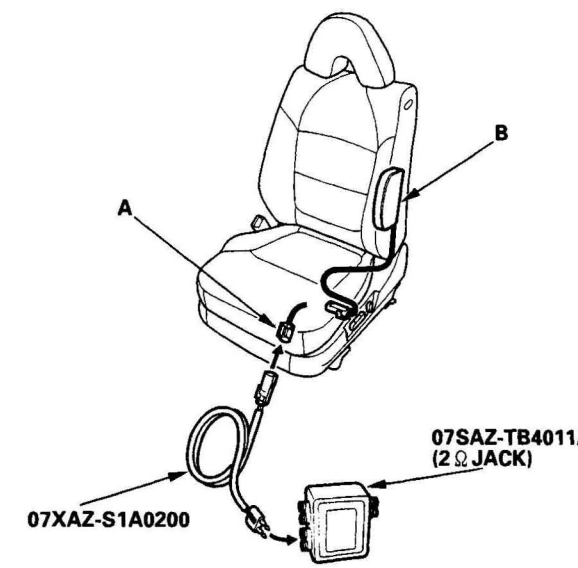
DTC 11-5: Short to ground in driver's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).



5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.

BACK

Protected by AR

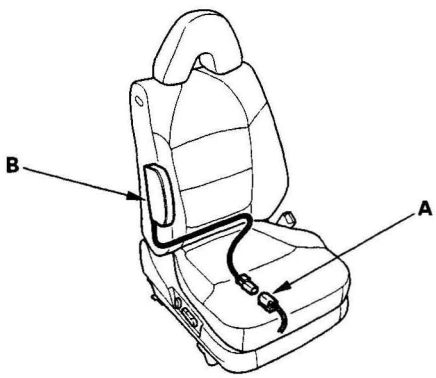
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 11-5 indicated?

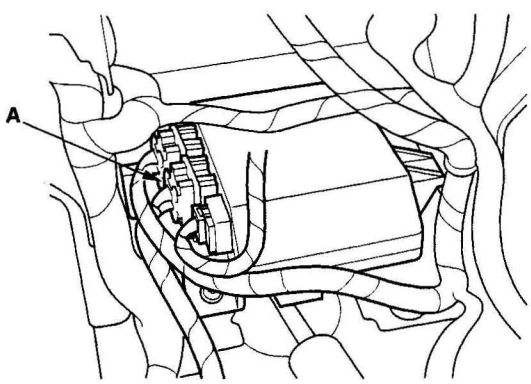
   YES – Go to step 9.

   NO – Short to ground in the driver's side airbag inflator; replace the driver's side airbag. ■

9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B), and disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.

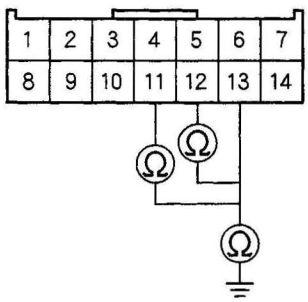


11. Disconnect the SRS unit connector (A) (14P) from the SRS unit (B).



12. Check resistance between the No. 13 and No. 11 terminals of SRS unit connector A (14P), and between the No. 13 and No. 12 terminals. Then check resistance between the No. 13 terminal of SRS unit connector A (14P) and body ground. There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to ground in the SRS floor harness; replace the SRS floor harness. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'02-03 Models

DTC 12-1: Open in front passenger's side airbag inflator

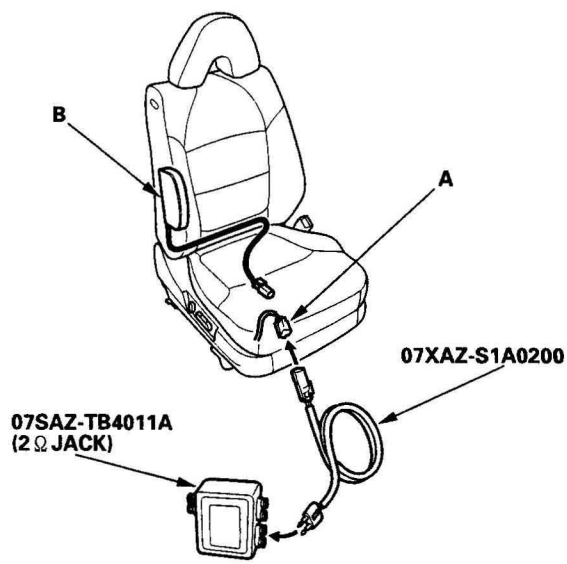
DTC 12-2: Increased resistance in front passenger's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).

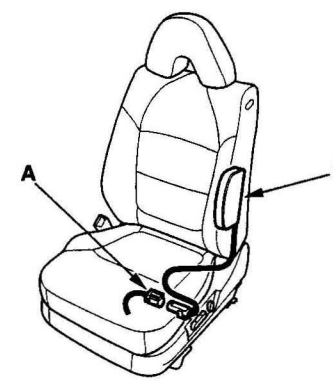


5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 12-1 or DTC 12-2 indicated?

   YES – Go to step 9.

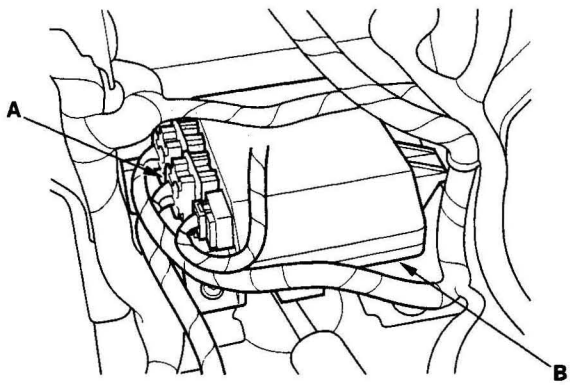
   NO – Open or increased resistance in the front passenger's side airbag inflator, replace the front passenger's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).



BACK

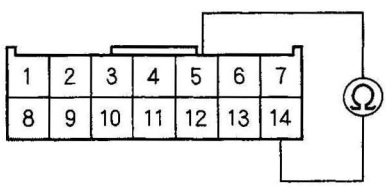
Protected by AR

11. Disconnect SRS unit connector (A) (14P) from the SRS unit (B). Do not disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.



12. Check resistance between the No. 5 and No. 14 terminals of SRS unit connector A (14P). There should be 2.0–3.0 Ω.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector A (14P) and the SRS unit; check the connection at SRS unit connector A (14P) and SRS unit. If the connector is OK, replace the SRS unit. ■

NO—Open or increased resistance in the SRS floor harness; replace the SRS floor harness. ■

'02-03 Models

DTC 12-3: Short to another wire or decreased resistance in front passenger's side airbag inflator

1. Erase the DTC memory (see page 23-32).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

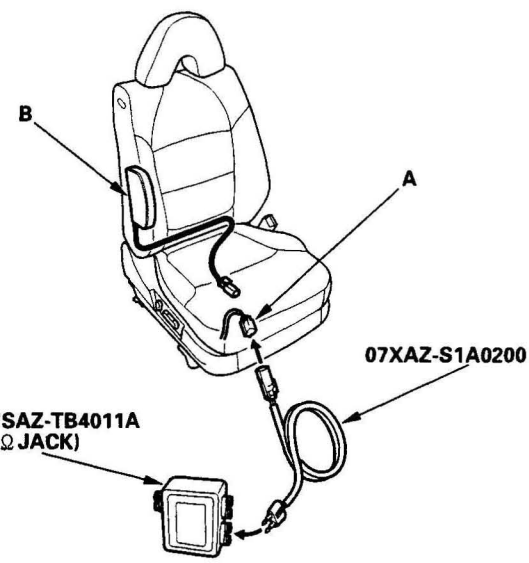
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

3. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the SRS floor harness 2P connector (A) from the passenger's side airbag (B).



5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.

(cont'd)

Protected by AR

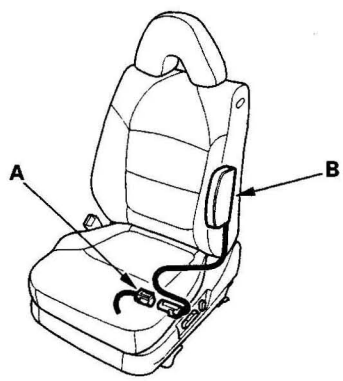
DTC Troubleshooting (cont'd)

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

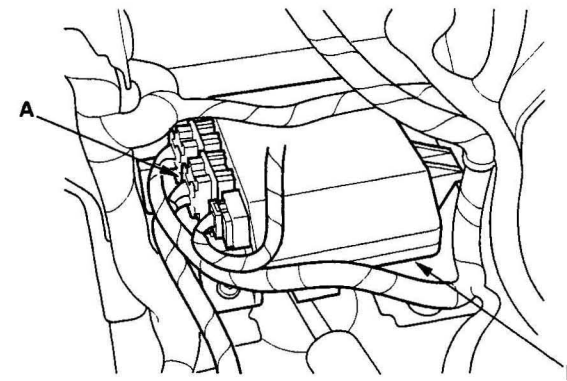
   Is DTC 12-3 indicated?

   YES—Go to step 9

   NO—Short to another wire in the front passenger's side airbag inflator; replace the front passenger's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).

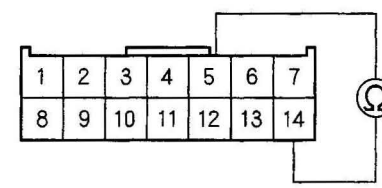


11. Disconnect the special tool (2 Ω) from the SRS floor harness 2P connector.
12. Disconnect SRS unit connector (A) (14P) from the SRS unit (B).



13. Check resistance between the No. 5 and No. 14 terminals of SRS unit connector A (14P). There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit. ■

NO—Short to another wire in the SRS floor harness; replace the SRS floor harness. ■

BACK

Protected by AR

'02-03 Models

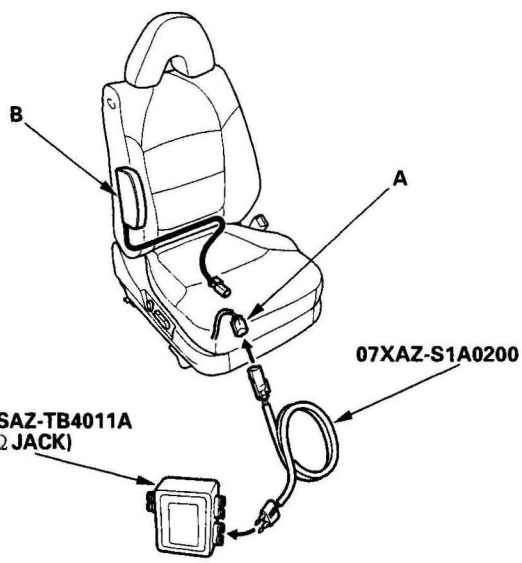
DTC 12-4: Short to power in front passenger's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).

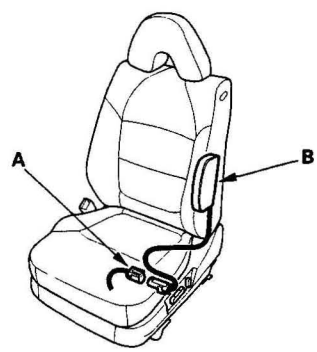


5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

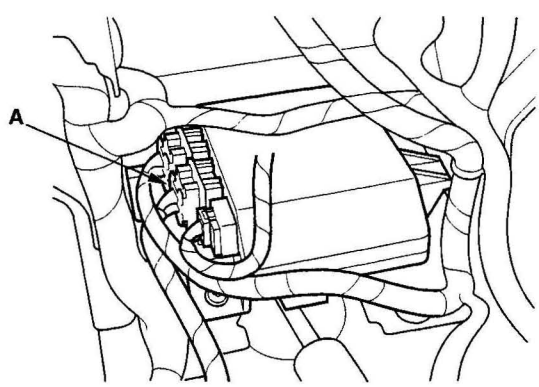
   Is DTC 12-4 indicated?

   YES – Go to step 9.

   NO – Short to power in the front passenger's side airbag inflator; replace the front passenger's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the front driver's side airbag (B).



11. Disconnect SRS unit connector (A) (14P) from the SRS unit.



(cont'd)

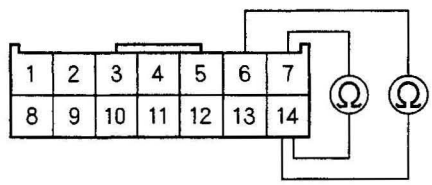
BACK

Protected by AR

DTC Troubleshooting (cont'd)

12. Check resistance between the No. 14 and No. 6 terminals of SRS unit connector A (14P), and between the No. 14 and No. 7 terminals of SRS unit connector A (14P). There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit.■

NO—Short to power in the SRS floor harness; replace the SRS floor harness.■

'02-03 Models

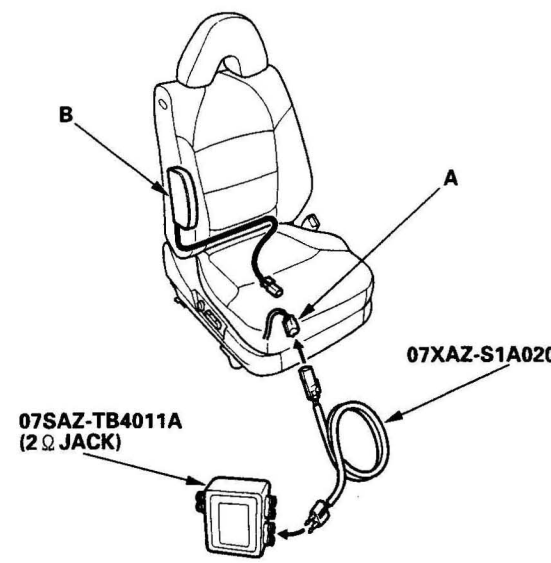
DTC 12-5: Short to ground in front passenger's side airbag inflator

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds, and then goes off.

   Does the SRS indicator light stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SRS floor harness 2P connector (A) from the front passenger's side airbag (B).



5. Connect the special tool (2 Ω) to the SRS floor harness 2P connector.

BACK

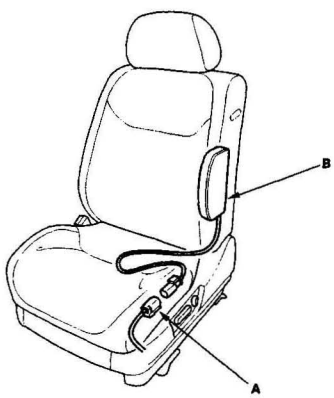
Protected by AR

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

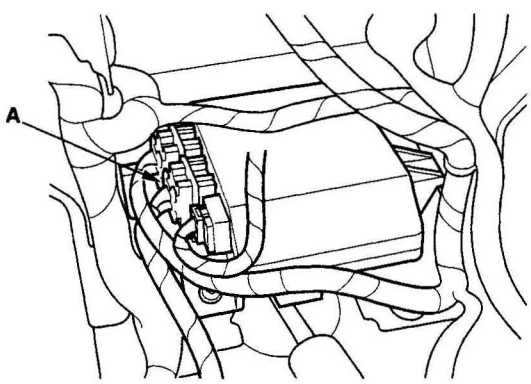
   Is DTC 12-5 indicated?

   YES – Go to step 9.

   NO – Short to ground in the front passenger's side airbag inflator, replace the front passenger's side airbag. ■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SRS floor harness 2P connector (A) from the driver's side airbag (B).

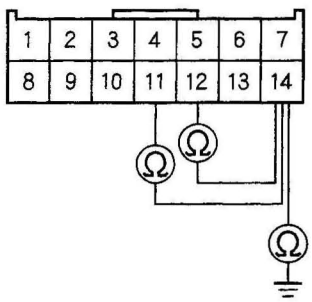


11. Disconnect SRS unit connector (A) (14P) from the SRS unit.



12. Check resistance between the No. 14 and No. 11 terminals of SRS unit connector A (14P), and between the No. 14 and No. 12 terminals. Then check resistance between the No. 14 terminal and body ground. There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Short to ground in the SRS floor harness; replace the SRS floor harness. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'02-03 Models

DTC 13-1: Faulty driver's side impact sensor or SRS unit

DTC 13-2: Faulty driver's side impact sensor or SRS unit

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Faulty driver's side impact sensor or SRS unit; replace the driver's side impact sensor. If the problem is still present, replace the SRS unit.■

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

'02-03 Models

DTC 13-3: No signal from the driver's side impact sensor

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Check the connection between the SRS floor harness 4P connector and the driver's side impact sensor.

   Is the connections OK?

   YES – Faulty SRS floor harness or driver's side impact sensor; replace the SRS floor harness. If the problem is still present, replace the driver's side impact sensor.■

   NO – Poor contact between the SRS floor harness 4P connector and the driver's side impact sensor; reconnect or replace the sensor.■

BACK

Protected by AR

'02-03 Models

DTC 14-1: Faulty front passenger's side impact sensor or SRS unit

DTC 14-2: Faulty front passenger's side impact sensor or SRS unit

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Faulty front passenger's side impact sensor or SRS unit; replace the front passenger's side impact sensor. If the problem is still present, replace the SRS unit. ■

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

'02-03 Models

DTC 14-3: No signal from the front passenger's side impact sensor

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Disconnect the battery negative cable, and wait for 3 minutes.
4. Check the connection between the SRS floor harness 4P connector and the front passenger's side impact sensor.

   Is the connections OK?

   YES – Faulty SRS floor harness or front passenger's side impact sensor; replace the SRS floor harness. If the problem is still present, replace the front passenger's side impact sensor. ■

   NO – Poor contact between the SRS floor harness 4P connector and the front passenger's side impact sensor; reconnect or replace the sensor. ■

Protected by AR

DTC Troubleshooting (cont'd)

'02-03 Models

DTC 15-1: Faulty OPDS Unit

NOTE: If a new OPDS unit was installed,verify it has the correct part number before continuing.

1. Make sure nothing is on the front passenger's seat.
2. Initialize the OPDS unit (see page 23-33).
3. Erase the DTC memory (see page 23-32).
4. Read the DTC.

   Is DTC 15-1 indicated?

   YES – Go to step 5.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

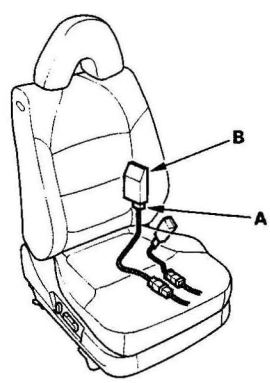
5. Check the No. 7 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 6.

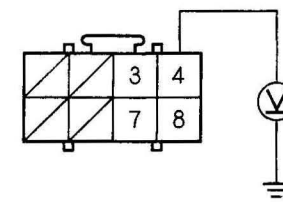
   NO – Go to step 9.

6. Disconnect OPDS unit harness 8P connector (A) from the OPDS unit (B).



7. Turn the ignition switch ON (II).
8. Check for voltage between the No. 4 terminal of OPDS unit harness 8P connector and body ground. There should be battery voltage.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 16.

NO – Open in the right side wire harness, OPDS unit harness, or dashboard wire harness A; replace the faulty harness. ■

9. Replace the No. 7 (7.5A) fuse in the driver's under-dash fuse/relay box.
10. Turn the ignition switch ON (II) for 30 seconds, then turn it OFF.
11. Check the No. 7 (7.5A) fuse in driver's under-dash fuse/relay box.

    Is the fuse OK?

    YES – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

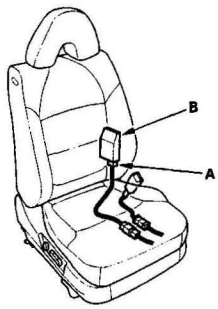
    NO – Go to step 12.

12. Replace the No. 7 (7.5A) fuse in the driver's under-dash fuse/relay box.

BACK

Protected by AR

13. Disconnect OPDS unit harness 8P connector (A) from the OPDS unit (B).



14. Turn the ignition switch ON (II) for 30 seconds, then turn it off.

15. Check the No. 7 (7.5A) fuse in the driver's under-dash fuse/relay box.

Is the fuse OK?

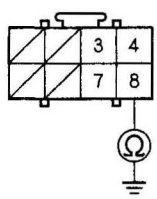
YES – Short to ground in the OPDS unit; replace the OPDS unit (see page 23-240). ■

NO – Short to ground in the No. 7 (7.5A) circuit (dashboard wire harness A, right side wire harness or OPDS unit harness); repair or replace the appropriate harness. ■

16. Turn the ignition switch OFF.

17. Check resistance between the No. 8 terminal of OPDS unit harness 8P connector and body ground. There should be 0 – 1.0 Ω.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

YES – Go to step 18.

NO – Open in right side wire harness or OPDS unit harness, or poor ground (G581). If G581 is OK, replace the faulty harness. ■

18. Disconnect the battery negative cable, and wait for 3 minutes.

19. Disconnect both side airbag connectors.

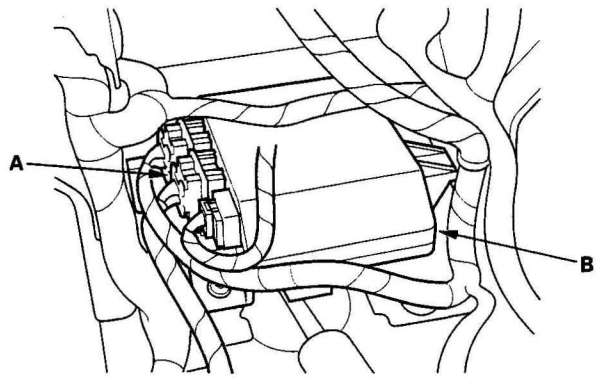


(cont'd)

Protected by AR

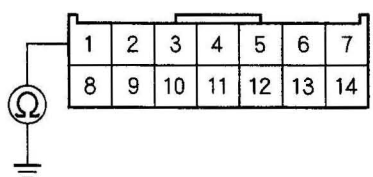
DTC Troubleshooting (cont'd)

20. Disconnect SRS unit connector A (14P) from the SRS unit (B).



21. Check resistance between the No. 1 terminal of SRS unit connector A (14P) and body ground. There should be an open circuit, or at least 1 MΩ.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

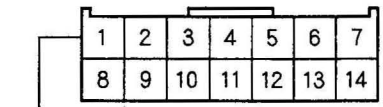
Is the resistance as specified?

YES – Go to step 22.

NO – Short to ground in the SRS floor harness, right side wire harness, or OPDS unit harness; replace the faulty harness. ■

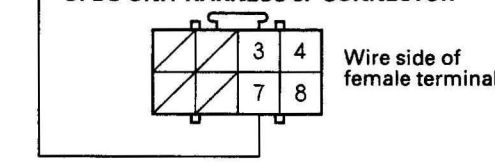
22. Check resistance between the No. 1 terminal of SRS unit connector A (14P) and the No. 7 terminal of the OPDS unit harness 8P connector. There should be 0 – 1.0 Ω.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

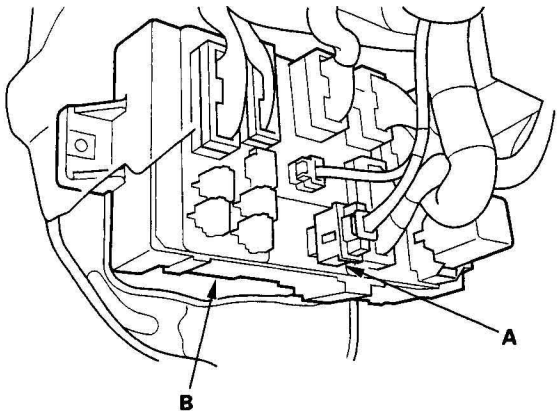
YES – Go to step 23.

NO – Open in the SRS floor harness, right side wire harness, or OPDS unit harness; replace the faulty harness. ■

BACK

Protected by AR

23. Disconnect the SRS main harness 2P connector (A) from the driver's under-dash fuse/relay box (B).

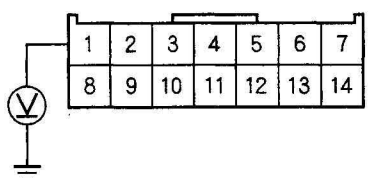


24. Reconnect the negative battery cable.

25. Turn the ignition switch ON (II).

26. Check for voltage between the No. 1 terminal of SRS unit connector A (14P) and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (14P)



Wire side of female terminals

Is the voltage as specified?

YES – Go to step 27.

NO – Short to power in the SRS floor harness, right side wire harness, or OPDS unit harness; replace the faulty harness. ■

27. Replace the OPDS unit (see page 23-240), then initialize the system (see page 23-33).

28. Erase the DTC memory, then check for DTC 15-1.

Is DTC 15-1 indicated?

YES – Replace the SRS unit (see page 23-237). ■

NO – The system is OK. ■

BACK

Protected by AR

DTC Troubleshooting (cont'd)

'02-03 Models

DTC 15-2: Faulty Side Airbag Cutoff Indicator Circuit

1. Make sure nothing is on the front passenger's seat.
2. Erase the DTC memory (see page 23-32).
3. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES – Turn the ignition switch OFF, and go to step 4.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

   NOTE: This DTC may have been caused by turning the ignition switch ON (II) with the gauge assembly disconnected.
4. Turn the ignition switch ON (II), and check that the side airbag cutoff indicator comes on.

   Does the side airbag cutoff indicator come on?

   YES – Go to step 5.

   NO – Go to step 6.
5. Make sure the side airbag cutoff indicator goes off after 5 seconds.

   Does the side airbag cutoff indicator go off after 5 seconds?

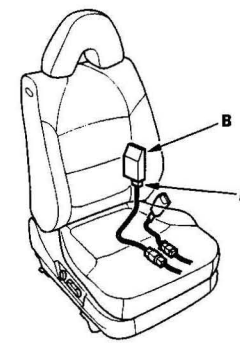
   YES – Faulty OPDS unit or SRS unit; replace the OPDS unit (see page 23-240). If the problem is still present, replace the SRS unit (see page 23-238). ■

   NO – Go to step 32.
6. Turn the ignition switch OFF.
7. Check the No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

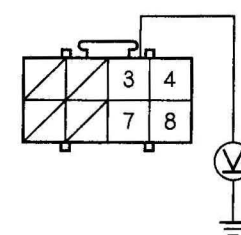
   YES – Go to step 8.

   NO – Replace the fuse, then turn the ignition switch ON (II). If the fuse blows again, check for a short in the No. 9 (7.5 A) fuse circuit (dashboard wire harness A, right side wire harness, or OPDS unit harness). ■
8. Disconnect OPDS unit harness 8P connector (A) from the OPDS unit (B).



9. Turn the ignition switch ON (II).
10. Check for voltage between the No. 3 terminal of OPDS unit harness 8P connector and body ground. There should be battery voltage.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES – Go to step 11.

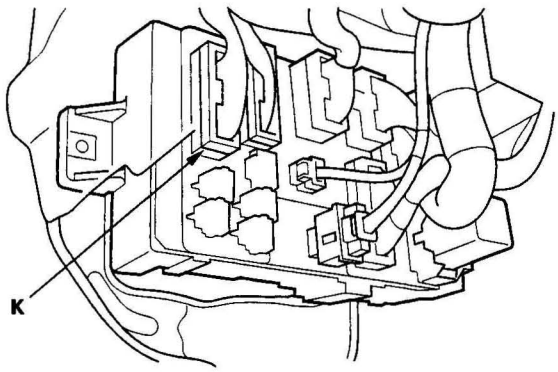
NO – Go to step 23.

BACK

Protected by AR

11. Turn the ignition switch OFF.

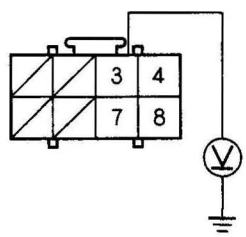
12. Disconnect the dashboard wire harness A 18P connector (K) from the driver's under-dash fuse/relay box.



13. Turn the ignition switch ON (II).

14. Check for voltage between the No. 3 terminal of OPDS unit harness 8P connector and body ground. There should be 0.5 V or less.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals

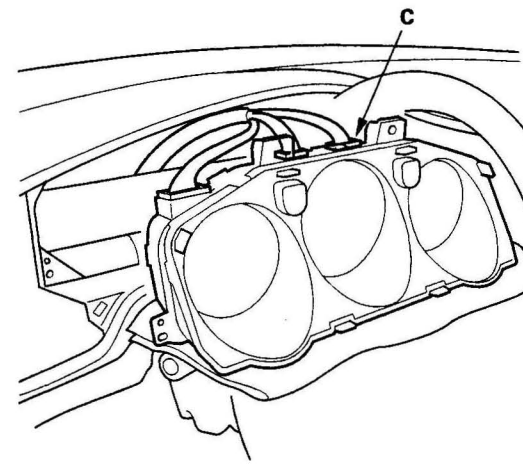
Is the voltage as specified?

YES – Faulty OPDS unit; replace the OPDS unit (see page 23-240). ■

NO – Go to step 15.

15. Turn the ignition switch OFF.

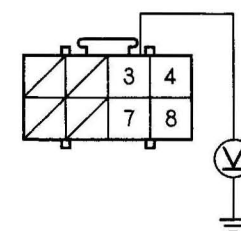
16. Disconnect gauge assembly connector C (18P) from the gauge assembly.



17. Turn the ignition switch ON (II).

18. Check for voltage between the No. 3 terminal of OPDS unit harness 8P connector and body ground. There should be 0.5 V or less.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals

Is the voltage as specified?

YES – Short to power in the gauge assembly; replace the gauge assembly. ■

NO – Go to step 19.

(cont'd)

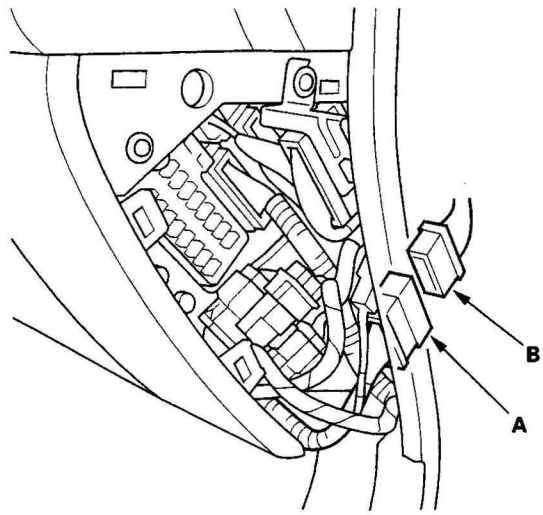
BACK

Protected by AR

DTC Troubleshooting (cont'd)

19. Turn the ignition switch OFF.

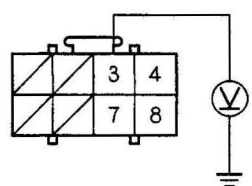
20. Disconnect the right side wire harness 20P connector C501 (A) from the dashboard wire harness A 20P connector (B).



21. Turn the ignition switch ON (II).

22. Check for voltage between the No. 3 terminal of the OPDS unit harness 8P connector and body ground. There should be 0.5 V or less.

OPDS UNIT HARNESS 8P CONNECTOR



Wire side of female terminals.

Is the voltage as specified?

YES – Short to power in dashboard wire harness A; replace dashboard wire harness A. ■

NO – Short to power in the right side wire harness or in the OPDS unit harness; if the OPDS unit harness is OK, replace the right side wire harness. ■

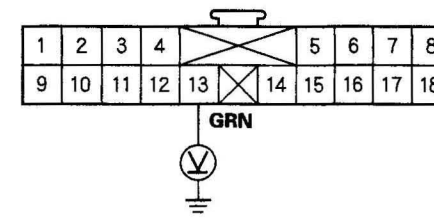
23. Turn the ignition switch OFF.

24. Backprobe the No. 13 terminal of gauge assembly connector C (18P). Do not disconnect gauge assembly connector C (18P) from the gauge assembly.

25. Turn the ignition switch ON (II).

26. Check for voltage between the No. 13 terminal of gauge assembly connector C (18P) and body ground. There should be battery voltage.

GAUGE ASSEMBLY CONNECTOR C (18P)



Wire side of female terminals

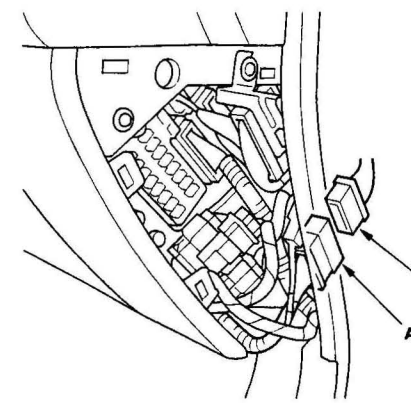
Is there battery voltage?

YES – Go to step 26.

NO – Go to step 30.

27. Turn the ignition switch OFF.

28. Disconnect the right side wire harness 20P connector C501 (A) from the dashboard wire harness A 20P connector (B).



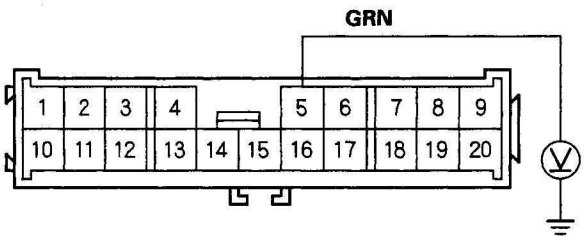
BACK

Protected by AR

29. Turn the ignition switch ON (II).

30. Check for voltage between the No. 5 terminal of the dashboard wire harness A 20P connector C501 and body ground. There should be battery voltage.

DASHBOARD WIRE HARNESS A 20P CONNECTOR



Terminal side of male terminals

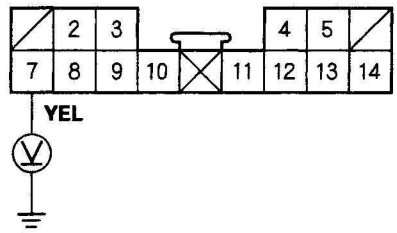
Is there battery voltage?

YES – Poor contact at the dashboard wire harness A 20P connector and right side wire harness, or an open in right side wire harness or in the OPDS unit harness. Check the connection; if the connection is OK, replace the faulty harness. ■

NO – Poor contact at gauge assembly connector C (18P) or an open in the dashboard wire harness A. Check gauge assembly connector C (18P); if the connections are OK, replace dashboard wire harness A. ■

31. Check for voltage between the No. 7 terminal of gauge assembly connector A (14P) and body ground. There should be battery voltage.

GAUGE ASSEMBLY CONNECTOR A (14P)



Wire side of female terminals

Is there battery voltage?

YES – Faulty side airbag cutoff indicator circuit; replace the gauge assembly. ■

NO – Open in dashboard wire harness A; replace dashboard wire harness A. ■

(cont'd)

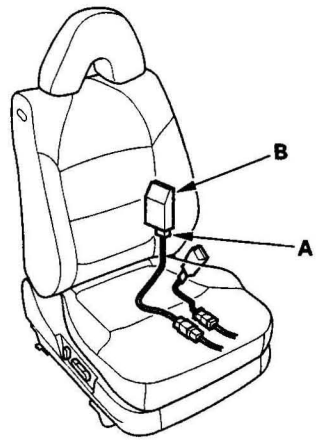
BACK

Protected by AR

DTC Troubleshooting (cont'd)

32. Turn the ignition switch OFF.

33. Disconnect the OPDS unit harness 8P connector (A) from the OPDS unit (B).



34. Turn the ignition switch ON (II).

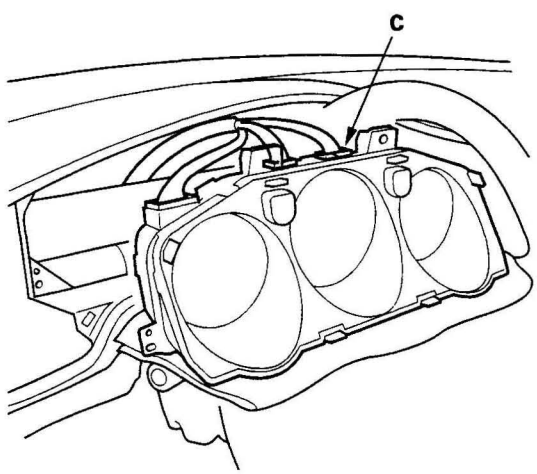
    Does the side airbag cutoff indicator come on?

    YES – Go to step 37.

    NO – Faulty OPDS unit; replace the OPDS unit. ■

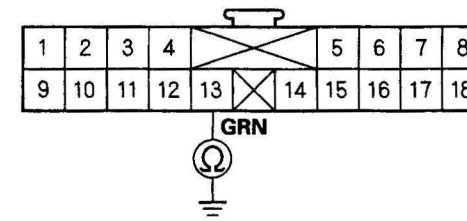
35. Turn the ignition switch OFF.

36. Disconnect gauge assembly connector C (18P) from the gauge assembly.



37. Check resistance between the No. 13 terminal of gauge assembly connector C (18P) and body ground. There should 1 MΩ or more.

GAUGE ASSEMBLY CONNECTOR C (18P)



Wire side of female terminals

Is the resistance as specified?

YES – Short to ground in the side airbag cutoff indicator circuit; replace the gauge assembly. ■

NO – Short to ground in the dashboard wire harness A, right side wire harness, or OPDS unit harness; replace the faulty harness. ■

BACK

Protected by AR

'02-03 Models

DTC 15-3: Faulty OPDS Sensor

1. Erase the DTC memory (see page 23-32).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

   NOTE: Aftermarket devices (fluorescent lights, laptop computers, etc.) used near the front passenger's seat-back can interfere with the seat-back sensors and cause a false DTC 15-3. If one of these devices was used, erase the DTC, operate the device near the seat-back, and recheck for DTCs. If DTC 15-3 is reset, erase it, and do not use the device near the seat-back.
3. Check the connection at the OPDS sensor harness connector and the OPDS unit connector.

   Are the connections OK?

   YES—Go to step 4.

   NO—Reconnect the OPDS sensor harness connector, and clear the DTC. ■
4. Replace the OPDS sensor/seat back foam (see page 20-90), and initialize the OPDS (see page 23-33).
5. Erase the DTC memory, then check for DTC 15-3.

   Is DTC 15-3 indicated?

   YES—Replace the OPDS unit (see page 23-240). ■

   NO—The system is OK. ■

Protected by AR

SRS Indicator Circuit Troubleshooting

'99 Model

When the ignition key is turned to the ON (II) position, the SRS control unit performs a self-test that takes about 6 seconds. During the self-test, there is not any voltage from the control unit going to the SRS indicator circuit. This turns the indicator light on. If the self-test is OK, the control unit will send approximately 8.5 V to the SRS indicator circuit. This turns the indicator light off.

The SRS Indicator Doesn't Come On

1. Turn the ignition switch ON (II), and check to see if the other indicator lights come on (brake system, etc).

   Do the other indicator lights come on?

   YES – Go to step 5.

   NO – Go to step 2.

2. Check the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 4.

   NO – Go to step 3.

3. Replace the No. 9 (7.5 A) fuse, and check to see if the SRS indicator light comes on.

   Does the SRS indicator come on?

   YES – The system is OK.■

   NO – Go to step 4.

4. Check for an open in the wire harness between fuse No. 9 (7.5 A) and the gauge assembly, and repair. Check that the SRS indicator comes on.

   Does the SRS indicator come on?

   YES – The system is OK.■

   NO – Go to step 5.

5. Turn the ignition switch OFF.

6. Remove the gauge assembly.

7. Check for a blown SRS indicator bulb.

   Is the SRS indicator light bulb OK?

   YES – Go to step 9.

   NO – Go to step 8.

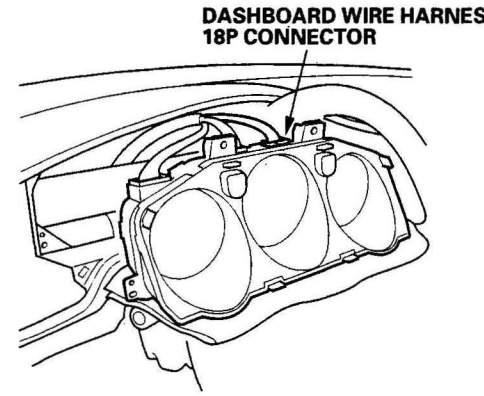
8. Replace the bulb, and reconnect the gauge assembly connectors. Then turn the ignition switch ON (II).

   Does the SRS indicator come on?

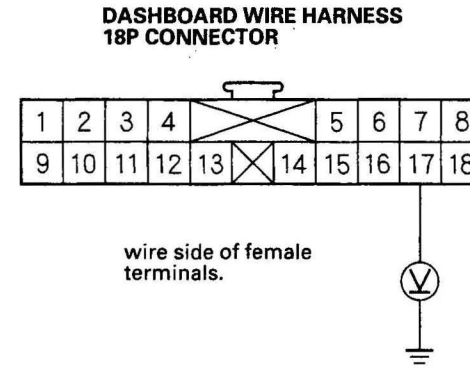
   YES – The system is OK.■

   NO – Go to step 9.

9. Turn the ignition switch OFF, and disconnect the dashboard wire harness 18P connector from the gauge assembly.



10. Connect a voltmeter between the No. 17 terminal (+) of the 18P connector and body ground.



BACK

Protected by AR

11. Turn the ignition switch ON (II), and measure voltage.

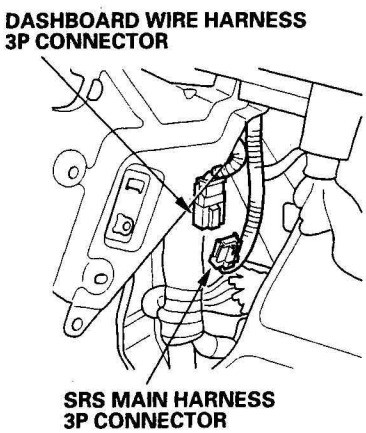
    Is there 8.5 V or less within the first 6 seconds after the ignition switch has been turned ON (II)?

    YES – Faulty SRS indicator circuit in the gauge assembly; replace the SRS indicator circuit board in the gauge assembly. ■

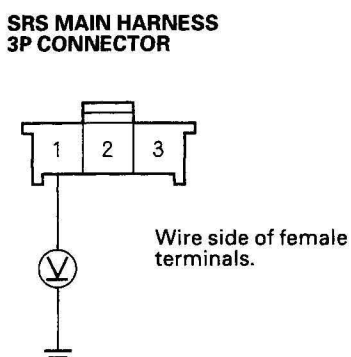
    NO – Go to step 12.

12. Turn the ignition switch OFF.

13. Disconnect the dashboard wire harness 3P connector from the SRS main harness.



14. Connect a voltmeter between the No. 1 terminal(+) of the SRS main harness 3P connector and body ground.



15. Turn the ignition switch ON (II), and measure voltage.

    Is there 8.5 V or more within the first 6 seconds after the ignition switch has been turned ON (II)?

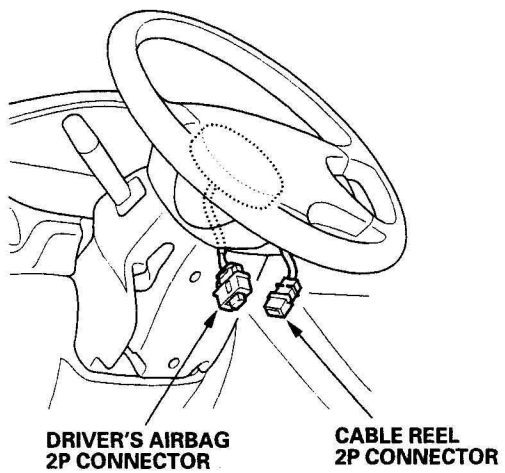
    YES – Short to power in the BLU wire of the dashboard wire harness; repair the harness. ■

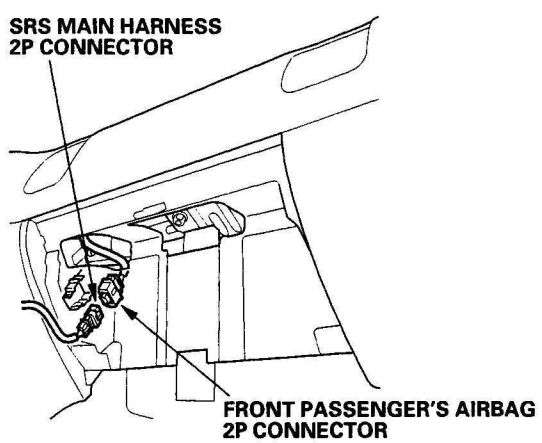
    NO – Go to step 16.

16. Turn the ignition switch OFF.

17. Disconnect the battery negative cable, and wait 3 minutes.

18. Disconnect the driver's and front passenger's airbag connectors.



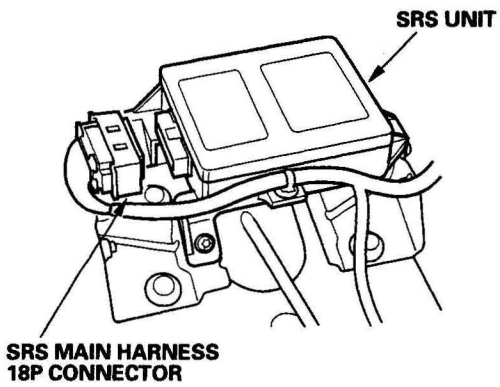


(cont'd)

Protected by AR

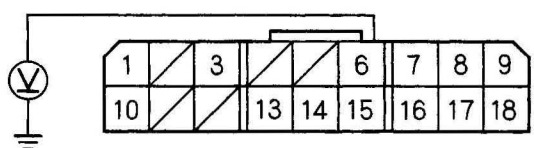
SRS Indicator Circuit Troubleshooting (cont'd)

19. Disconnect the SRS main harness 18P connector from the SRS unit.



20. Connect a voltmeter between the No. 6 terminal(+) of the SRS main harness 18P connector and body ground.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

21. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.

Is voltage as specified?

YES – Faulty SRS unit; replace the unit (see page 23-237). ■

NO – Short to power in the BLU wire of the SRS main harness; replace the harness. ■

'99 Model

SRS Indicator Stays On After the Ignition Switch is Turned ON (II)

1. Erase the DTC memory (see page 23-32). If the memory can't be erased, go to step 3.
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and goes off.

   Does the SRS indicator stay on?

   YES – Go to step 3.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).
3. Turn the ignition switch OFF.
4. Check for blown No. 2 (10 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 8.

   NO – Go to step 5.
5. Replace the No. 2 (10 A) fuse.
6. Erase the DTC memory.
7. Turn the ignition switch ON (II).

   Does the SRS indicator go off after 6 seconds?

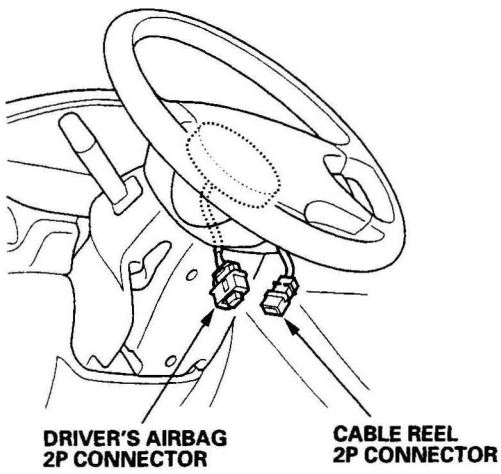
   YES – The system is OK. ■

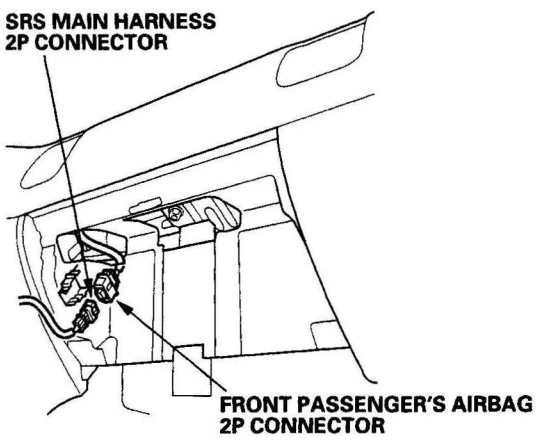
   NO – Confirm the DTC, and continue troubleshooting.
8. Disconnect the battery negative cable, and wait for 3 minutes.

BACK

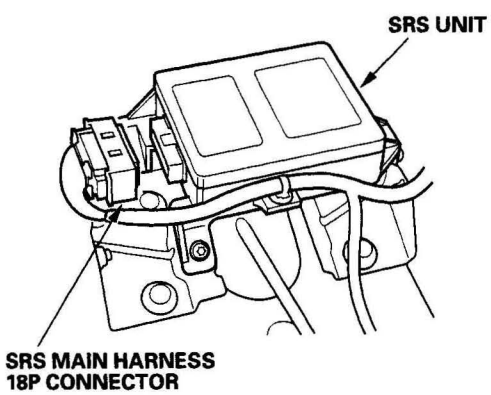
Protected by AR

9. Disconnect the driver's and front passenger's airbag connectors.





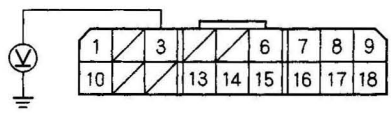
10. Disconnect the SRS main harness 18P connector from the SRS unit.



11. Reconnect the battery negative cable.

12. Connect a voltmeter between the No. 3 terminal (+) of the SRS main harness 18P connector and body ground.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

13. Turn the ignition switch ON (II).

Is there battery voltage?

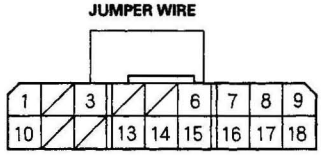
YES – Go to step 14.

NO – Open in the SRS main harness (VB line); replace the harness. ■

14. Connect the SRS main harness 18P connector terminals No. 6 and No. 3 with a jumper wire and backprobe adapters.

SRS MAIN HARNESS 18P CONNECTOR

JUMPER WIRE



Wire side of female terminals.

Does the SRS indicator light go off?

YES – Faulty SRS unit or poor contact at the SRS main harness 18P connector; check the connector. If the connector is OK, replace the SRS unit (see page 23-237). ■

NO – Go to step 15.

15. Remove the jumper wire, and check the No. 2 (10A) fuse in the driver's under-dash fuse/relay box.

Did fuse No. 2 (10 A) blow?

YES – Go to step 16.

NO – Go to step 19.

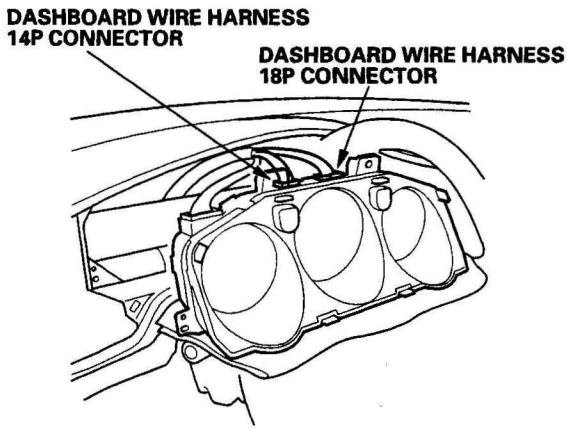
(cont'd)

Protected by AR

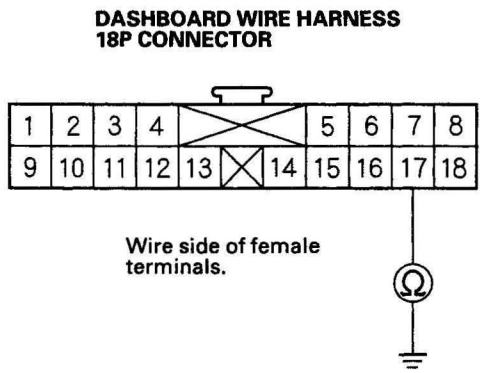
SRS Indicator Circuit Troubleshooting (cont'd)

16. Turn the ignition switch OFF.

17. Disconnect the dashboard wire harness 18P connector from the gauge assembly.



18. Check resistance between the No. 17 terminal of the dashboard wire harness 18P connector and body ground. There should be 1 MΩ or more.



Is the resistance as specified?

YES – Short to ground in the gauge assembly; replace the gauge assembly. ■

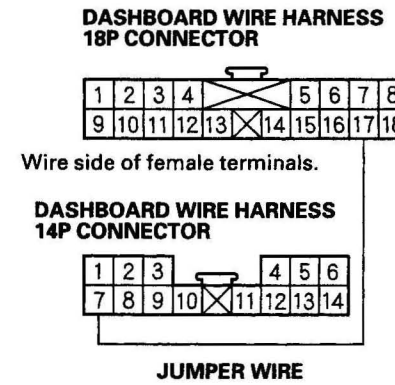
NO – Go to step 26.

19. Turn the ignition switch OFF.

20. Remove the gauge assembly. Do not disconnect the connector from the gauge assembly.

21. Turn the ignition switch ON (II).

22. Connect the No. 17 terminal of the dashboard wire harness 18P connector and No. 7 terminal of the dashboard wire harness 14P connector with a jumper wire.



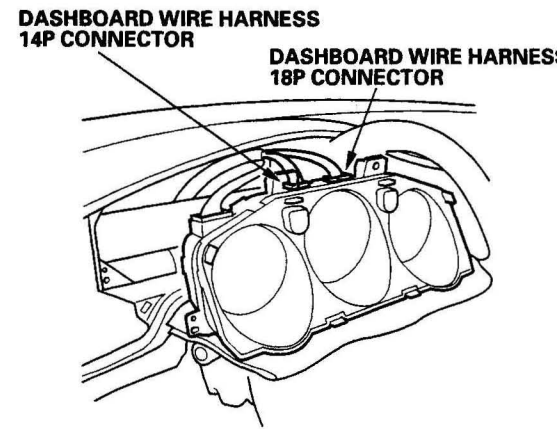
Does the SRS indicator light go off?

YES – Remove the jumper wire, then go to step 23.

NO – Faulty SRS indicator light circuit in the gauge assembly; replace the SRS printed circuit board in the gauge assembly. ■

23. Turn the ignition switch OFF.

24. Disconnect the dashboard wire harness 18P connector from the gauge assembly.

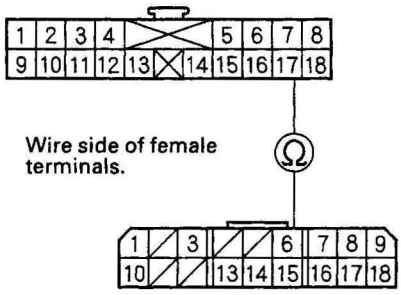


BACK

Protected by AR

25. Check resistance between the No. 6 terminal of the SRS main harness 18P connector and No. 17 terminal of the dashboard wire harness 18P connector; there should be 0 – 1.0 Ω.

DASHBOARD WIRE HARNESS 18P CONNECTOR



SRS MAIN HARNESS 18P CONNECTOR

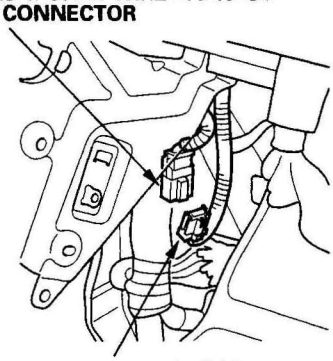
Is the resistance as specified?

YES – Go to step 28.

NO – Go to step 31.

26. Disconnect the SRS main harness 3P connector from the dashboard wire harness.

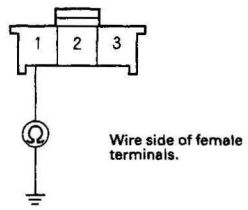
DASHBOARD WIRE HARNESS 3P CONNECTOR



SRS MAIN HARNESS 3P CONNECTOR

27. Check resistance betweeen the No. 1 terminal of the SRS main harness 3P connector and body ground. There should be 1 MΩ or more.

SRS MAIN HARNESS 3P CONNECTOR



Is the resistance as specified?

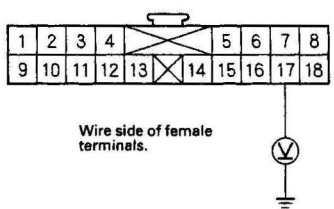
YES – Short to ground in the dashboard wire harness; repair the dashboard wire harness. ■

NO – Short to ground in the SRS main harness; replace the SRS main harness. ■

28. Reconnect the SRS main harness 18P connector to the SRS unit.

29. Connect a voltmeter between the No. 17 terminal (+) of the dashboard wire harness 18P connector and body ground.

DASHBOARD WIRE HARNESS 18P CONNECTOR



30. Turn the ignition switch ON (II), wait for 6 seconds, then measure voltage.

Is there 8.5 V or more?

YES – The problem corrected itself after disconnecting and connecting the connectors. Be sure all terminals make good contact, and recheck the system for an intermittent failure (see page 23-32). ■

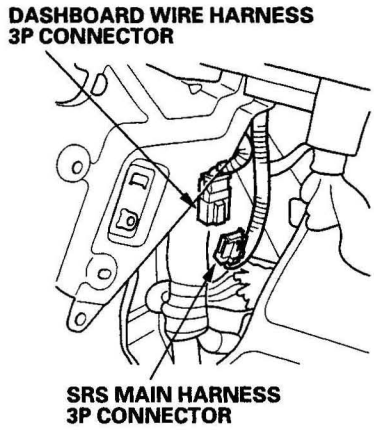
NO – Poor contact at the SRS main harness 18P connector; check the connector.
If the connector is OK, substitute a known-good SRS unit, and recheck.
If the connector is damaged, replace the SRS main harness. ■

(cont'd)

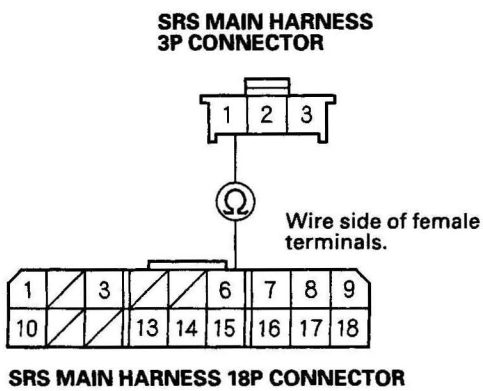
Protected by AR

SRS Indicator Circuit Troubleshooting (cont'd)

31. Disconnect the SRS main harness 3P connector from the dashboard wire harness.



32. Check resistance between the No. 6 terminal of the SRS main harness 18P connector and No. 1 terminal of the SRS main harness 3P connector; there should be 0 – 1.0 Ω.



Is the resistance as specified?

YES – Open in the BLU wire of the dashboard wire harness; repair the dashboard wire harness. ■

NO – Open in the SRS main harness; replace the SRS main harness. ■

'99 Model

SRS Indicator Stays On, But No DTCs are Stored.

NOTE: If not already done, check for DTCs using the SCS menu method before you begin.

1. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 2.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

2. Check for blown No. 1 (15 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 11.

   NO – Go to step 3.

3. Replace the fuse. Turn the ignition switch ON (II), and check that the fuse doesn't blow.

   Is the fuse OK?

   YES – The problem has disappeared. Test-drive the vehicle and see Troubleshooting Intermittent Failures (see page 23-32).

   NO – Go to step 4.

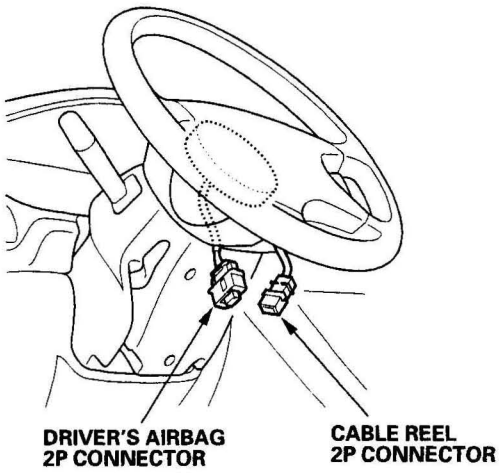
4. Turn the ignition switch OFF.

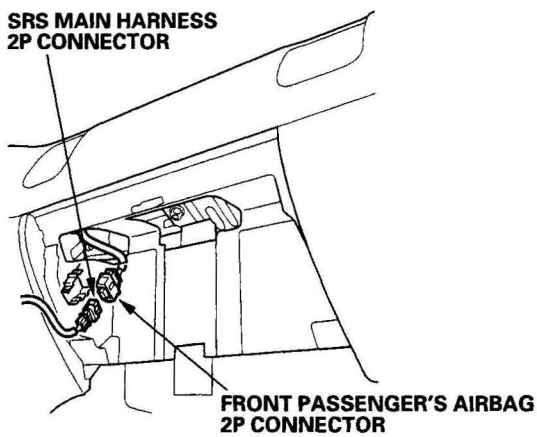
5. Disconnect the battery negative cable, and wait for 3 minutes.

BACK

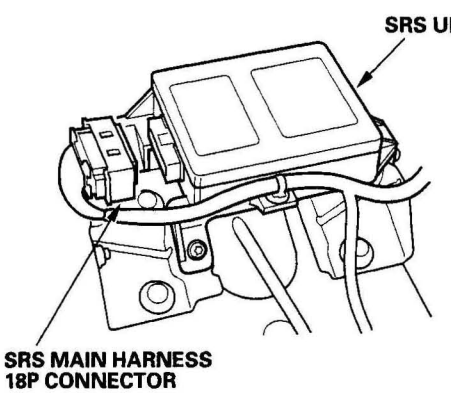
Protected by AR

6. Disconnect the driver's and front passenger's airbag connectors.



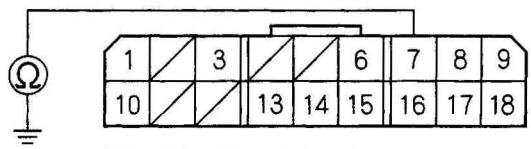


7. Disconnect the SRS main harness 18P connector from the SRS unit.



8. Check resistance between the No. 7 terminal of the SRS main harness 18P connector and body ground. There should be 1 MΩ or more.

SRS MAIN HARNESS 18P CONNECTOR



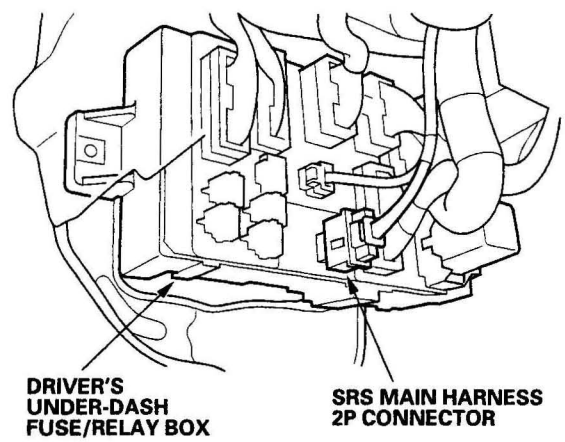
Wire side of female terminals

Is the resistance as specified?

YES — Faulty SRS unit; replace the SRS unit (see page 23-237). ■

NO — Go to step 9.

9. Disconnect the SRS main harness 2P connector from the driver's under-dash fuse/relay box.



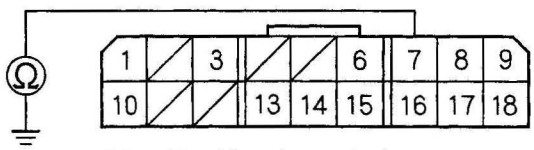
(cont'd)

Protected by AR

SRS Indicator Circuit Troubleshooting (cont'd)

10. Check resistance between the No. 7 terminal of the SRS main harness 18P connector and body ground. There should be 1.0 MΩ or more.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals

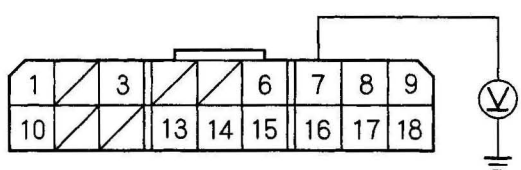
Is the resistance as specified?

YES – Short to ground in the driver's under-dash fuse/relay box; replace the driver's under-dash fuse/relay box. ■

NO – Short to ground in the SRS main harness; replace the SRS main harness. ■

11. Connect a voltmeter between the No. 7 terminal of the SRS main harness 18P connector and body ground.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

12. Turn the ignition switch ON (II), and measure voltage.

Is there battery voltage?

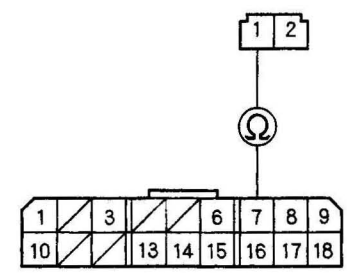
YES – Poor contact at the SRS main harness 18P connector; check the connector.
If the connector is OK, substitute a known-good SRS unit, and recheck.
If the connector is damaged, replace the SRS main harness. ■

NO – Go to step 13.

13. Turn the ignition switch OFF.

14. Check resistance between the No. 1 terminal of the SRS main harness 2P connector and the No. 7 terminal of the SRS main harness 18P connector. There should be 0 – 0.5 Ω.

SRS MAIN HARNESS 2P CONNECTOR



SRS MAIN HARNESS 18P CONNECTOR

Wire side of female terminals.

Is the resistance as specified?

YES – Poor contact at the SRS main harness 2P connector; check the connector.
If the connector is OK, substitute a known-good under-dash fuse/relay box, and recheck.
If the connector is damaged, replace the SRS main harness. ■

NO – Open in the SRS main harness, replace the SRS main harness. ■

BACK

Protected by AR

'00-01 Models

The SRS Indicator Doesn't Come On

1. Turn the ignition switch ON (II), and check to see if the other indicator lights come on (brake system, etc).

   Do the other indicator lights come on?

   YES – Go to step 5.

   NO – Go to step 2.

2. Turn the ignition switch OFF, and check the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 14.

   NO – Go to step 3.

3. Replace the No. 9 (7.5 A) fuse, and check to see if the SRS indicator comes on.

   Does the SRS indicator come on?

   YES – The system is OK. ■

   NO – Go to step 4.

4. Check for a short to ground between fuse No. 9 (7.5 A) and the gauge assembly, and repair. Make sure the SRS indicator comes on.

   Does the SRS indicator come on?

   YES – The system is OK. ■

   NO – Short to ground in the gauge assembly; replace the circuit board in the gauge assembly. ■

5. Turn the ignition switch OFF.

6. Remove the gauge assembly.

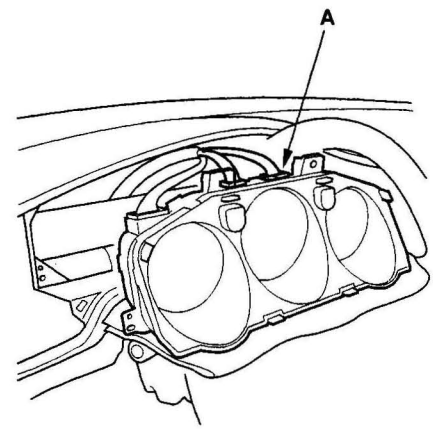
7. Check for a blown SRS indicator bulb.

   Is the SRS indicator bulb OK?

   YES – Go to step 8.

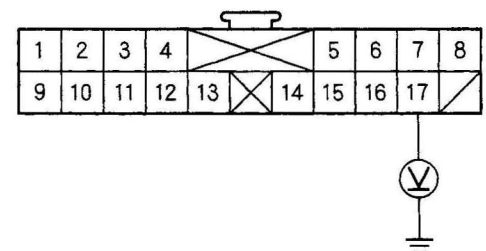
   NO – Blown SRS indicator bulb; replace the bulb. ■

8. Disconnect the dashboard wire harness A 18P connector (A) from the gauge assembly.



9. Connect a voltmeter between the No. 17 terminal (+) of the dashboard wire harness A 18P connector and body ground.

DASHBOARD WIRE HARNESS A 18P CONNECTOR



Wire side of female terminals.

10. Turn the ignition switch ON (II), and measure voltage.

    Is there 8.5 V or less for 6 seconds after the ignition switch has been turned ON (II)?

    YES – Faulty SRS indicator circuit in the gauge assembly; replace the SRS indicator circuit board in the gauge assembly. ■

    NO – Go to step 11.

11. Turn the ignition switch OFF.

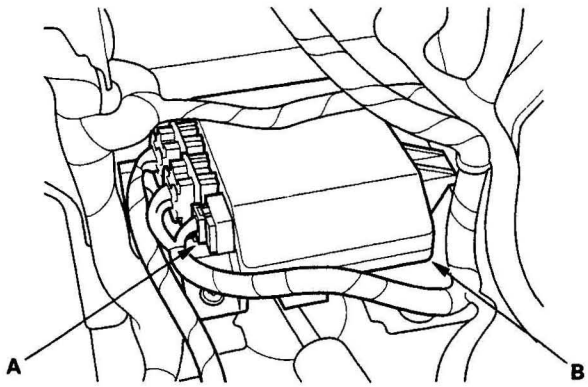
(cont'd)

BACK

Protected by AR

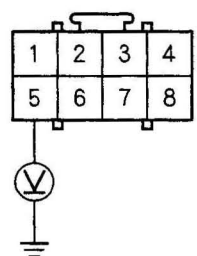
SRS Indicator Circuit Troubleshooting (cont'd)

12. Disconnect the SRS main harness A 8P connector (A) from the SRS unit (B).



13. Connect a voltmeter between the No. 5 terminal (+) of the SRS main harness 8P connector and body ground. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.

SRS MAIN HARNESS 8P CONNECTOR



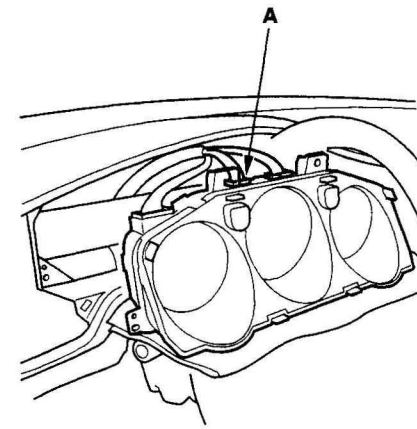
Wire side of female terminals.

Is voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-237).■

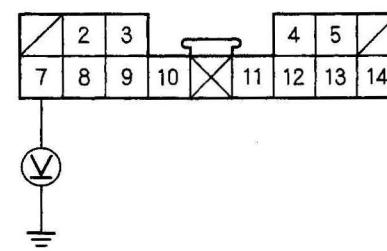
NO—Short to power in the BLU wire of dashboard wire harness A or the SRS main harness; replace dashboard wire harness A or the SRS main harness. ■

14. Disconnect the dashboard wire harness A 14P connector (A) from the gauge assembly.



15. Connect the voltmeter between the No. 7 terminal of the dashboard wire harness A 14P connector and body ground. Turn the ignition switch ON (II), and measure voltage. There should be battery voltage.

DASHBOARD WIRE HARNESS 14P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 16.

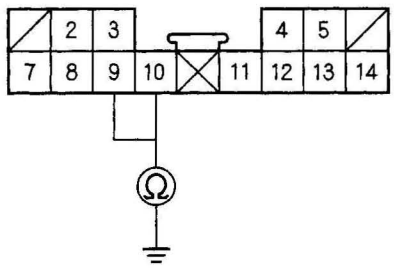
NO—Open in dashboard wire harness A; repair or replace dashboard wire harness A.■

BACK

Protected by AR

16. Turn the ignition switch OFF. Check resistance between the No. 9 (or No. 10) terminal of the dashboard wire harness A 14P connector and body ground. There should be 0 – 1.0 Ω.

DASHBOARD WIRE HARNESS A 14P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

YES – Faulty SRS indicator circuit in the gauge assembly; replace the SRS indicator circuit board in the gauge assembly. ■

NO – Open in dashboard wire harness A or body ground; check the body ground. If body ground is OK, repair or replace the dashboard wire harness A. ■

'00-01 Models

The SRS Indicator Stays On When In "SCS" Menu Method

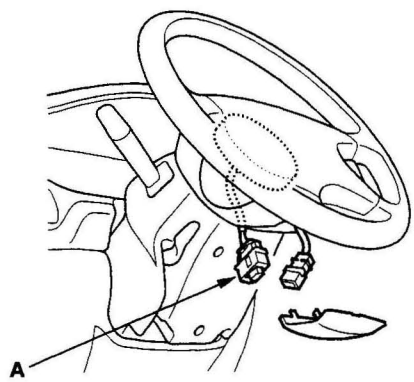
1. Check for blown No. 2 (10 A) fuse in the driver's under-dash fuse/relay box.

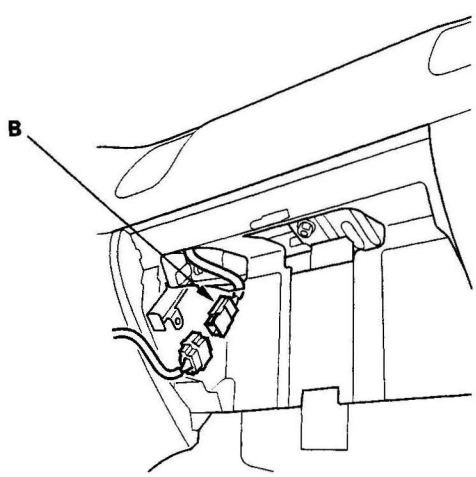
   Is the fuse OK?

   YES – Go to step 2.

   NO – Replace the No. 2 (10 A) fuse. Turn the ignition switch ON (II), and check for blown No. 2 (10 A) fuse. If the fuse is blown, replace the SRS main harness. If the fuse is OK; replace the SRS unit. ■

2. Disconnect the driver's airbag 2P connector (A) and front passenger's airbag 4P connector (B).



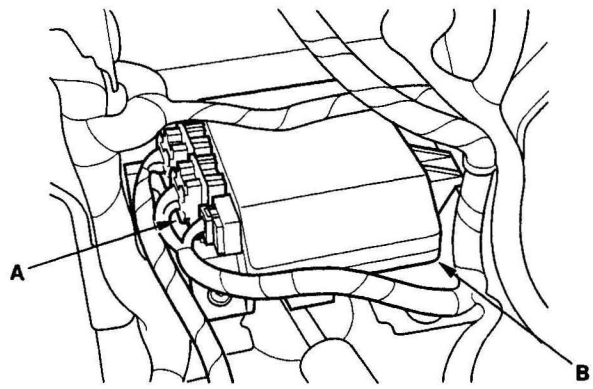


(cont'd)

Protected by AR

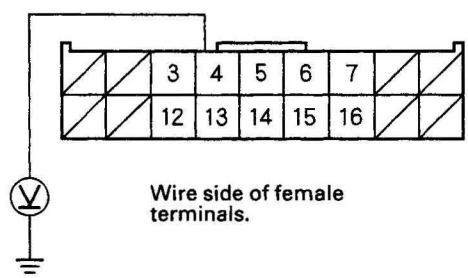
SRS Indicator Circuit Troubleshooting (cont'd)

3. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



4. Connect a voltmeter between the No. 4 terminal (+) of the SRS main harness 18P connector and body ground.

SRS MAIN HARNESS 18P CONNECTOR



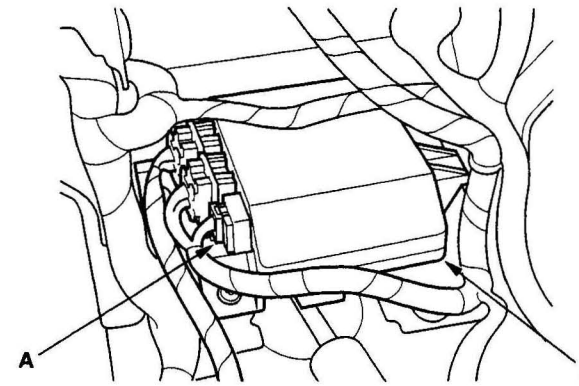
5. Turn the ignition switch ON (II).

Is there battery voltage?

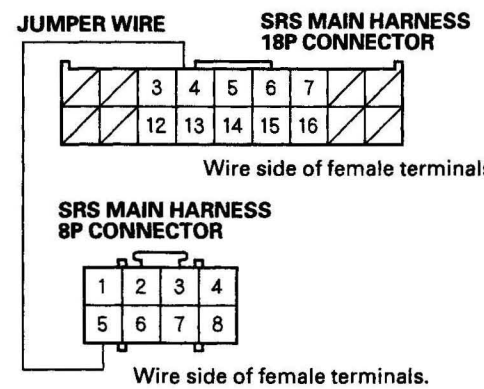
YES—Go to step 6.

NO—Open in the SRS main harness (VB line); replace the SRS main harness. ■

6. Turn the ignition switch OFF. Disconnect the SRS main harness 8P connector (A) from the SRS unit (B).



7. Connect the No. 4 terminal of the SRS main harness 18P connector and the No. 5 terminal of the SRS main harness 8P connector with a jumper wire and backprobe adapters. Turn the ignition switch ON (II).



Does the SRS indicator go off?

YES—Faulty SRS unit or poor contact at the SRS main harness 18P connector or poor contact at the SRS main harness 8P connector; check the connectors. If the connectors are OK, replace the SRS unit (see page 23-237). ■

NO—Go to step 8.

BACK

Protected by AR

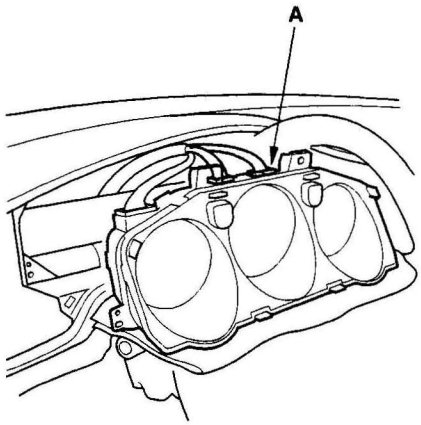
8. Turn the ignition switch OFF. Check the No. 2 (10 A) fuse in the driver's under-dash fuse/relay box.

   Did fuse No. 2 (10 A) blow?

   YES – Go to step 9.

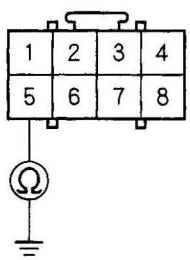
   NO – Go to step 11.

9. Disconnect the dashboard wire harness A 18P connector (A) from the gauge assembly.



10. Check resistance between the No. 5 terminal of the SRS main harness 8P connector and body ground. There should be 1 MΩ or more.

SRS MAIN HARNESS 8P CONNECTOR



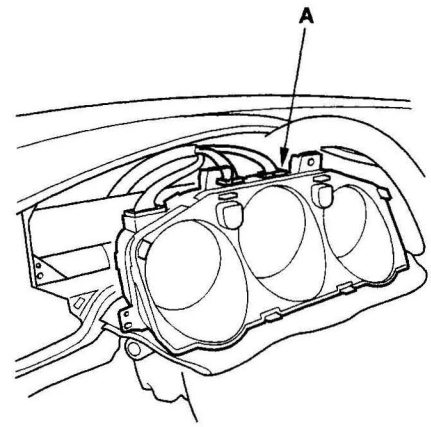
Wire side of female terminals.

Is the resistance as specified?

YES – Short to ground in the gauge assembly; replace the gauge assembly. ■

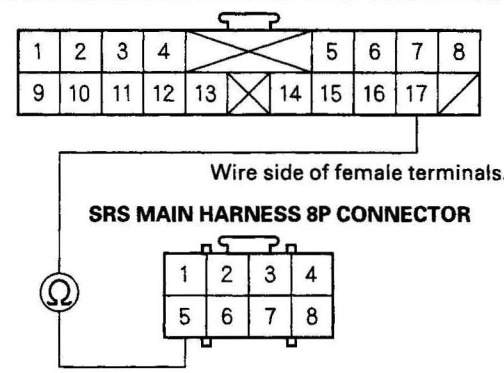
NO – Short to ground in the BLU wire of the dashboard wire harness A or the SRS main harness; replace the dashboard wire harness or the SRS main harness. ■

11. Disconnect the dashboard wire harness 18P connector (A) from the gauge assembly.



12. Check resistance between the No. 5 terminal of the SRS main harness 8P connector and the No. 17 terminal of the dashboard wire harness A 18P connector. There should be 0 – 1.0 Ω.

DASHBOARD WIRE HARNESS A 18P CONNECTOR



Is the resistance as specified?

YES – Faulty SRS indicator circuit in the gauge assembly; replace the SRS indicator circuit board in the gauge assembly. ■

NO – Open in the BLU wire of dashboard wire harness A or the SRS main harness; replace dashboard wire harness A or the SRS main harness. ■

(cont'd)

Protected by AR

SRS Indicator Circuit Troubleshooting (cont'd)

'00-01 Models

The SRS Indicator Stays On, But No DTCs are Stored (NEC SRS unit only)

NOTE: If not already done, check for DTCs using the SCS menu method before you begin.

1. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 2.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

2. Check for blown No. 1 (15 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 10.

   NO – Go to step 3.

3. Replace the fuse. Turn the ignition switch ON (II), and check that the fuse doesn't blow.

   Is the fuse OK?

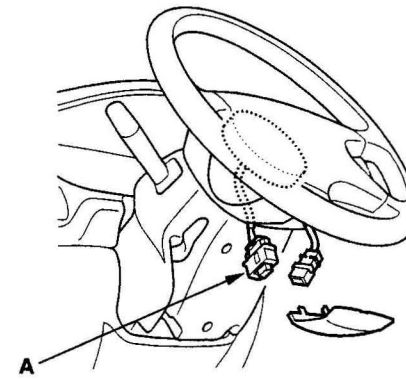
   YES – The problem has disappeared. Test-drive the vehicle and see Troubleshooting Intermittent failures (see page 23-32). ■

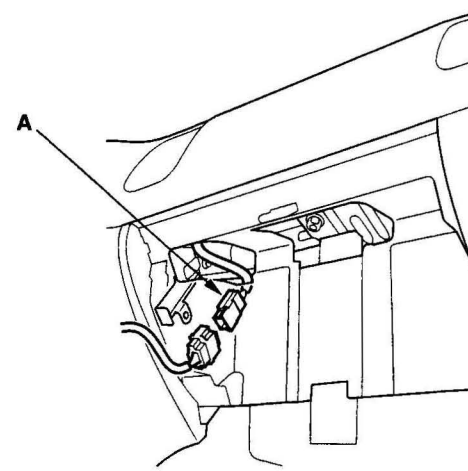
   NO – Go to step 4.

4. Turn the ignition switch OFF.

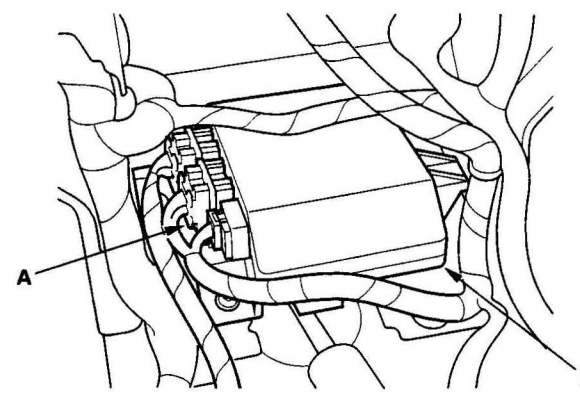
5. Disconnect the battery negative cable, and wait for 3 minutes.

6. Disconnect the driver's and front passenger's airbag connectors.





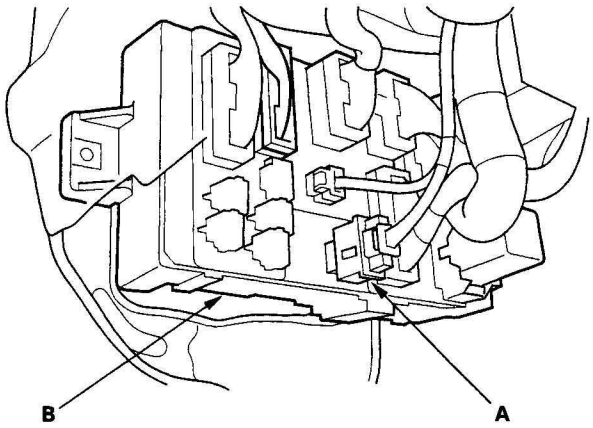
7. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



BACK

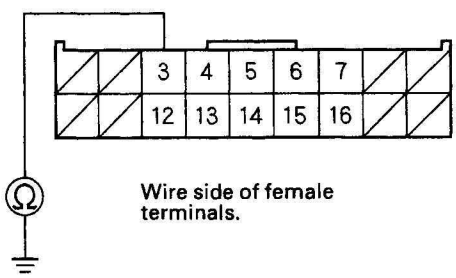
Protected by AR

8. Disconnect the SRS main harness 2P connector (A) from the driver's under-dash fuse/relay box (B).



9. Check resistance between the No. 3 terminal of the SRS main harness 18P connector and body ground. There should be 1 MΩ or more.

SRS MAIN HARNESS 18P CONNECTOR



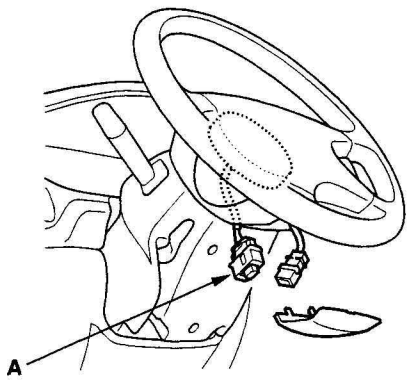
Is the resistance as specified?

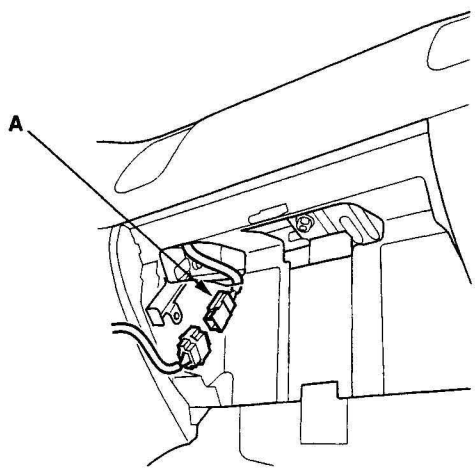
YES – Short to ground in No. 1 (15 A) fuse circuit or faulty SRS unit; check the No. 1 (15 A) fuse circuit. If the circuit is OK, replace the SRS unit (see page 23-237). ■

NO – Short to ground in the SRS main harness; replace the harness. ■

10. Disconnect the battery negative cable, and wait for 3 minutes.

11. Disconnect the driver's airbag and front passenger's airbag connectors (A).



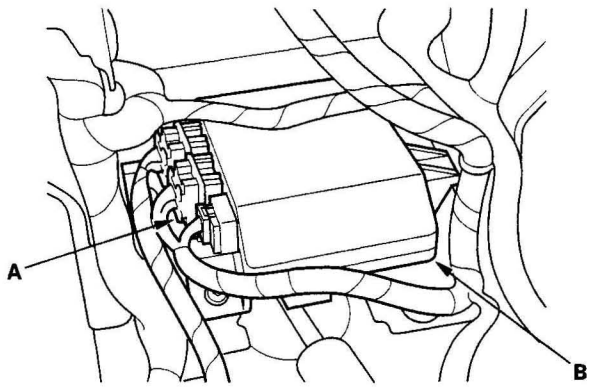


(cont'd)

Protected by AR

SRS Indicator Circuit Troubleshooting (cont'd)

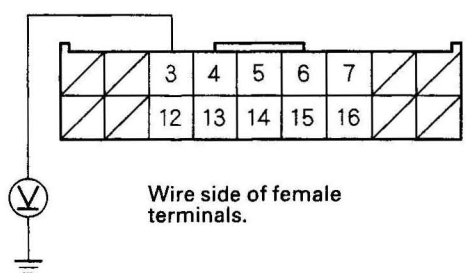
12. Disconnect the SRS main harness 18P connector (A) from the SRS unit (B).



13. Reconnect the battery negative cable.

14. Connect a voltmeter between the No. 3 terminal of the SRS main harness 18P connector and body ground.

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals.

15. Turn the ignition switch ON (II), and measure voltage.

Is there battery voltage?

YES – Poor contact at the SRS main harness 18P connector or faulty SRS unit; check the connector. If the connector is OK, replace the SRS unit. ■

NO – Poor contact at the SRS main harness 2P connector or open in the SRS main harness; check the connector. If the connector is OK, replace the SRS main harness. ■

BACK

Protected by AR

'02-03 Models

The SRS Indicator Doesn't Come On

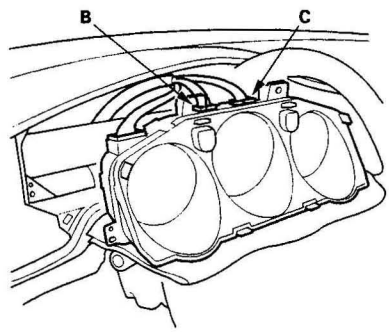
1. Turn the ignition switch ON (II), and check to see if the other indicators come on (brake system, etc).

   Do the other indicators come on?

   YES – Go to step 2.

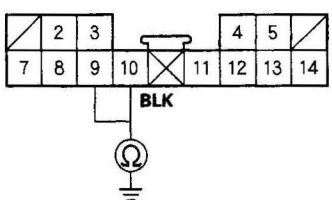
   NO – Go to step 8.

2. Turn the ignition switch OFF, then disconnect gauge assembly connector B (14P) and C (18P) from the gauge assembly.



3. Check resistance between the No. 9 (or No. 10) terminals of gauge assembly connector A (14P) and body ground. There should be 0 – 1.0 Ω.

GAUGE ASSEMBLY CONNECTOR A (14P)



Wire side of female terminals

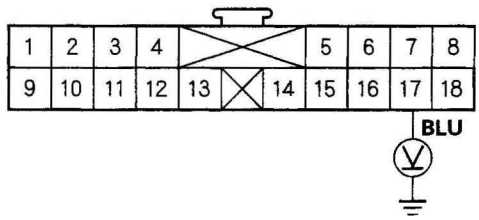
Is the resistance as specified?

YES – Go to step 4.

NO – Open in the BLK wire of dashboard wire harness A or faulty body ground terminal (G501). If the body ground terminal is OK, replace dashboard wire harness A.■

4. Check for voltage between the No. 17 terminal of gauge assembly connector C (18P) and body ground within the first 6 seconds after turning the ignition switch ON (II). There should be 8.5 V or less.

GAUGE ASSEMBLY CONNECTOR C (18P)



Wire side of female terminals

Is the voltage as specified?

YES – Faulty SRS indicator circuit in the gauge assembly; replace the gauge assembly.■

NO – Go to step 5.

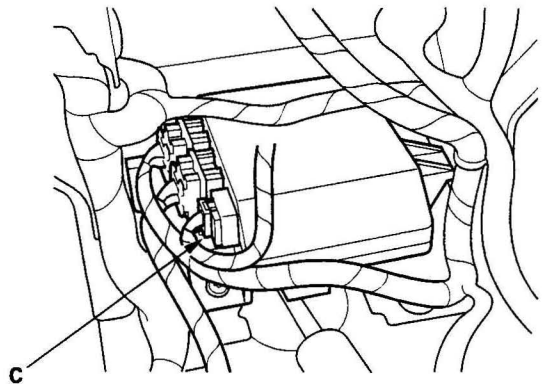
5. Turn the ignition switch OFF.

(cont'd)

Protected by AR

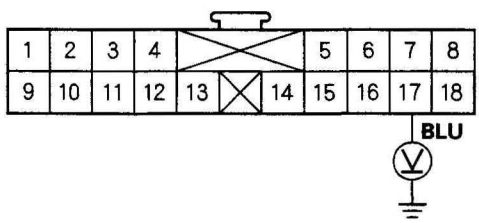
SRS Indicator Circuit Troubleshooting (cont'd)

6. Disconnect the SRS unit connector C (8P) from the SRS unit.



7. Connect a voltmeter between the No. 17 terminal (+) of gauge assembly connector C (18P) and body ground. Turn the ignition switch ON (II), and measure the voltage. There should be 0.5 V or less.

GAUGE ASSEMBLY CONNECTOR C (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit.■

NO—Short to power in the BLU wire of dashboard wire harness A; replace dashboard wire harness A.■

8. Turn the ignition switch OFF. Check the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box.

Is the fuse blow?

YES—Go to step 10.

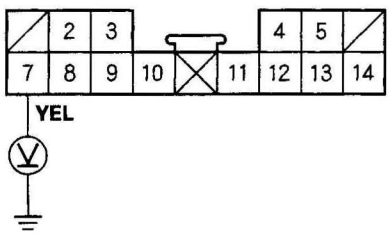
NO—Go to step 9.

BACK

Protected by AR

9. Connect a voltmeter between the No. 7 terminal (+) of gauge assembly connector A (14P) and body ground. Turn the ignition switch ON (II), and measure the voltage. There should be battery voltage.

GAUGE ASSEMBLY CONNECTOR A (14P)



Wire side of female terminals

Is there battery voltage?

YES—Faulty SRS indicator circuit in the gauge assembly or poor contact at the gauge assembly connector A (14P) and gauge assembly; if the connection is OK, replace the gauge assembly. ■

NO—Open in the driver's under-dash fuse/relay box No. 10 (7.5 A) fuse line or open in the YEL wire of dashboard wire harness A. If the driver's under-dash fuse/relay box is OK, replace dashboard wire harness A. ■

10. Replace the No. 9 (7.5 A) fuse, and check to see if the SRS indicator comes on.

Do the indicators come on?

YES—The system is OK at this time. ■

NO—Repair the short to ground in the driver's under-dash fuse/relay box No. 9 (7.5A) fuse circuit. ■

(cont'd)

BACK

Protected by AR

SRS Indicator Circuit Troubleshooting (cont'd)

'02-03 Models

The SRS Indicator Stays On After the Ignition Switch is Turned ON (II)

NOTE:
- If you cannot retrieve DTCs with the PGM Tester using the SCS menu method, retrieve the flash codes with the Tester in SCS mode (see page 23-24).
- A new SRS unit must sense the entire system is OK before completing its initial self-test. The most common cause of an incomplete self-test is the failure to replace all deployed parts after a collision,in particular, seat belt tensioners and seat belt buckle tensioners.
- An incoplete self-test prevents the PGM Tester from retrieving DTCs, although flash codes are available in the Testers SCS mode.

1. Erase the DTC memory, using the MES connector (see page 23-32).

   Does the SRS indicator blink twice, go off, and then come back on while you are erasing the DTC memory?

   YES – Go to step 42.

   NO – Go to step 2.

2. Check the No. 13 (10 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 19.

   NO – Go to step 3.

3. Replace the No. 13 (10 A) fuse in the under-dash fuse/relay box.

4. Turn the ignition switch ON (II) and wait for 30 seconds. Then turn the ignition switch OFF.

5. Check the No. 13 (10 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

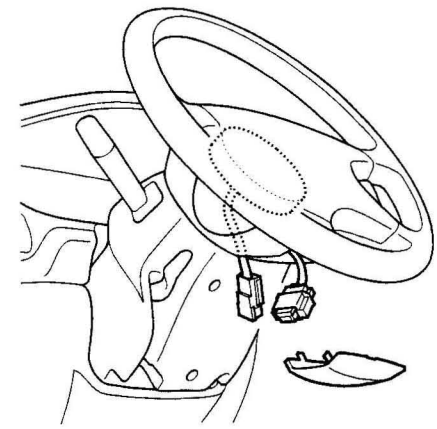
   YES – The system is OK at this time.■

   NO – Go to step 6.

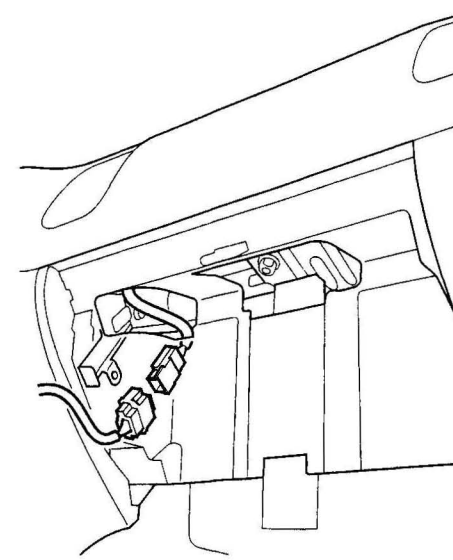
6. Replace the No. 13 (10 A) fuse in the under-dash fuse/relay box.

7. Disconnect the battery negative cable, and wait for 3 minutes.

8. Disconnect the driver's airbag 4P connector.



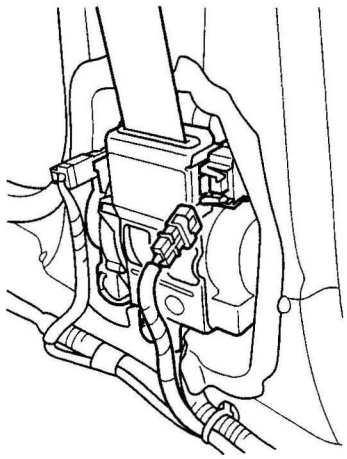
9. Disconnect the front passenger's airbag 4P connector.



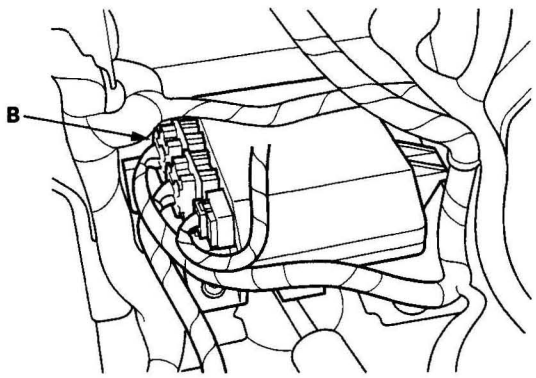
BACK

Protected by AR

10. Disconnect both seat belt tensioner 2P connectors.



11. Disconnect SRS unit connector B (18P) from the SRS unit.



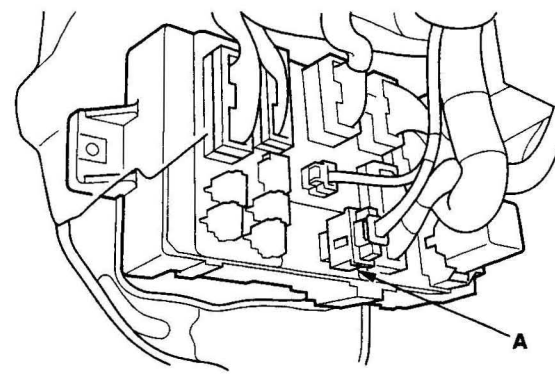
12. Reconnect the negative battery cable.
13. Turn the ignition switch ON (II) and wait for 30 seconds. Then turn the ignition switch OFF.
14. Check the No. 2 (10 A) fuse in the driver's under-dash fuse/relay box.

    Is the fuse OK?

    YES — Short to ground in the SRS unit; replace the SRS unit. ■

    NO — Go to step 15.

15. Replace the No. 2 (10 A) fuse in the driver's under-dash fuse/relay box.
16. Disconnect the SRS main harness 2P connector (A) from the driver's under-dash fuse/relay box.



17. Turn the ignition switch ON (II) and wait for 30 seconds. Then turn the ignition switch OFF.
18. Check the No. 2 (10 A) fuse in the driver's under-dash fuse/relay box.

    Is the fuse OK?

    YES — Short to ground in the SRS main harness; replace the SRS main harness. ■

    NO — Short to ground in the driver's under-dash fuse/relay box; replace the driver's under-dash fuse/relay box. ■

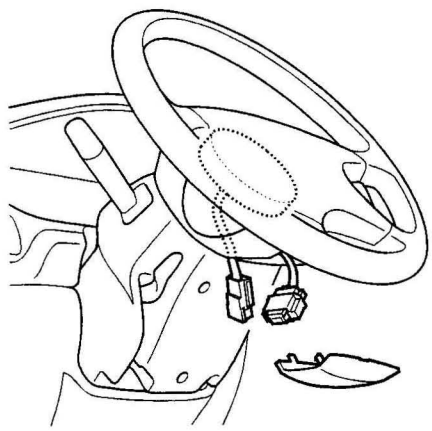
(cont'd)

Protected by AR

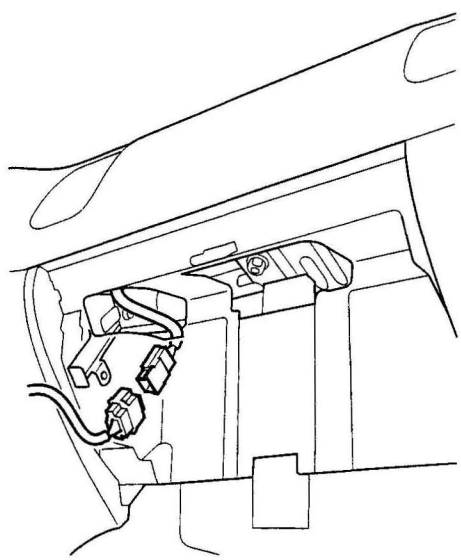
SRS Indicator Circuit Troubleshooting (cont'd)

19. Disconnect the battery negative cable and wait for 3 minutes.

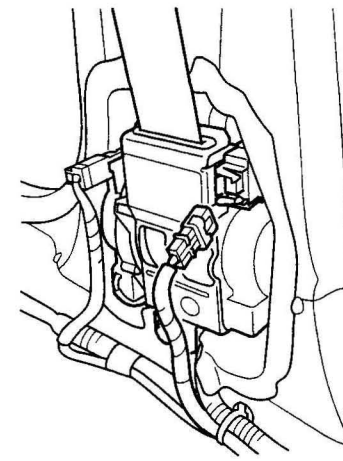
20. Disconnect the driver's airbag 4P connector.



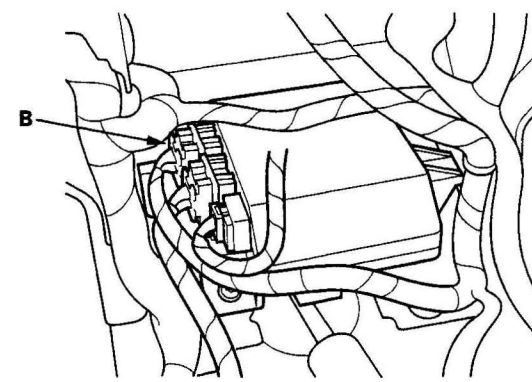
21. Disconnect the front passenger's 4P connector.



22. Disconnect both seat belt tensioner 2P connectors.



23. Disconnect SRS unit connector B (18P) from the SRS unit.



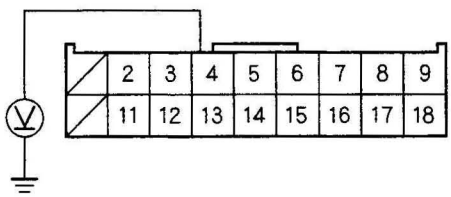
BACK

Protected by AR

24. Reconnect the battery negative cable.

25. Connect a voltmeter between the No. 4 terminal of SRS unit connector B (18P) and body ground. Turn the ignition switch ON (II), and measure voltage. There should be battery voltage.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

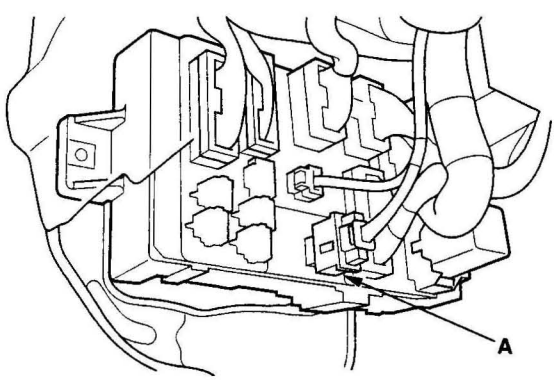
Is there battery voltage?

YES – Go to step 29.

NO – Go to step 26.

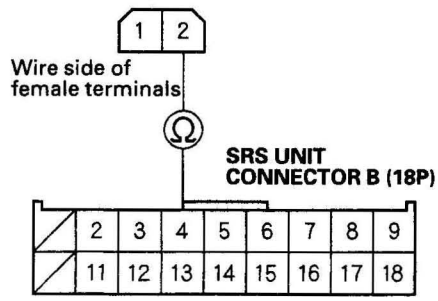
26. Turn the ignition switch OFF.

27. Disconnect the SRS main harness 2P connector (A) from the driver's under-dash fuse/relay box.



28. Check resistance between the No. 4 terminal of SRS unit connector B (18P) and the No. 2 terminal of SRS main harness 2P connector. There should be 0 – 1.0 Ω.

SRS MAIN HARNESS 2P CONNECTOR



Wire side of female terminals

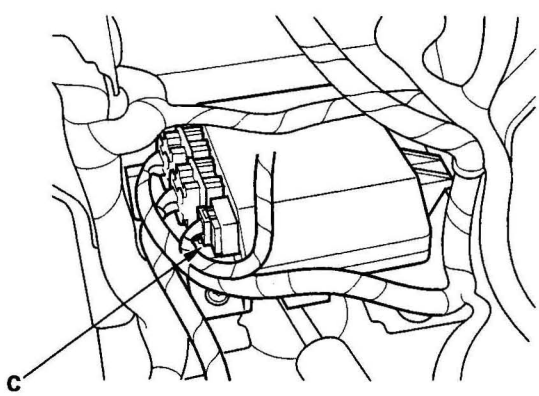
Is the resistance as specified?

YES – Open in the driver's under-dash fuse/relay box, or poor contact at the SRS main harness 2P connector; check the connection. If the connection is OK, replace the driver's under-dash fuse/relay box. ■

NO – Open in the SRS main harness; replace the SRS main harness. ■

29. Turn the ignition switch OFF.

30. Disconnect SRS unit connector C (8P) from the SRS unit.



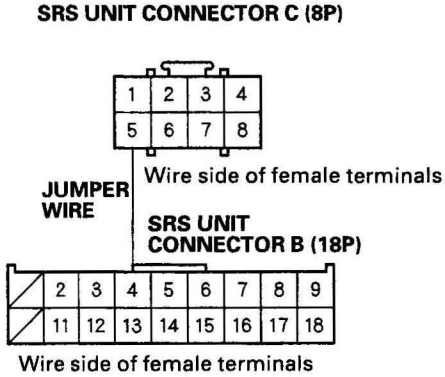
(cont'd)

BACK

Protected by AR

SRS Indicator Circuit Troubleshooting (cont'd)

31. Connect the No. 4 terminal of SRS unit connector B (18P) and the No. 5 terminal of SRS unit connector C (8P) with a jumper wire.



32. Turn the ignition switch ON (II).

33. Check the SRS indicator.

Did the SRS indicator go off?

YES – Faulty SRS unit; replace the SRS unit. ■

NO – Go to step 34.

34. Turn the ignition switch OFF.

35. Disconnect the jumper wire between the No. 4 terminal of SRS unit connector B (18P) and the No. 5 terminal of SRS unit connector C (8P).

36. Check the No. 2 (10 A) fuse in the driver's under-dash fuse/relay box.

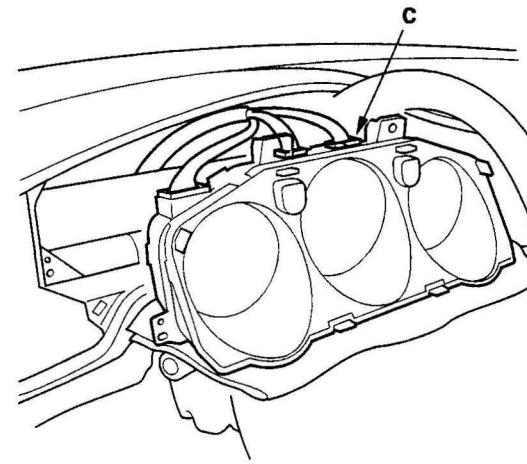
Is the fuse OK?

YES – Go to step 40.

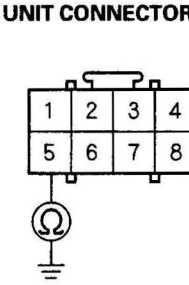
NO – Go to step 37.

37. Replace the No. 2 (10 A) fuse in the driver's under-dash fuse/relay box.

38. Disconnect gauge assembly connector C (18P) from the gauge assembly.



39. Check resistance between the No. 5 terminal of SRS unit connector C (8P) and body ground. There should be 1 MΩ or more.



Is the resistance as specified?

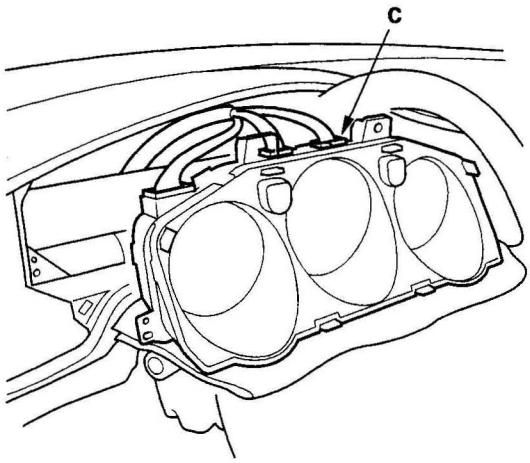
YES – Faulty SRS indicator circuit in the gauge assembly; replace the gauge assembly. ■

NO – Short to ground in dashboard wire harness A; replace dashboard wire harness A. ■

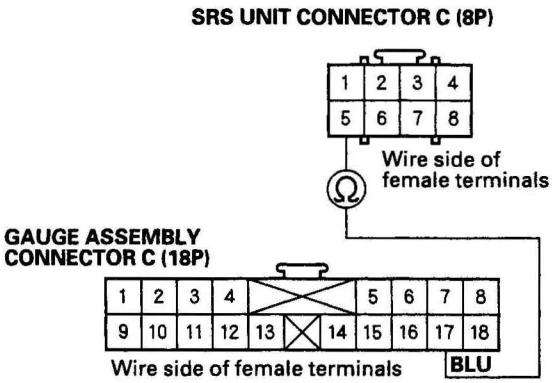
BACK

Protected by AR

40. Disconnect gauge assembly connector C (18P) from the gauge assembly.



41. Check resistance between the No. 17 terminal of the gauge assembly connector C (18P) and the No. 5 terminal of SRS unit connector C (8P). There should be 1 Ω or less.

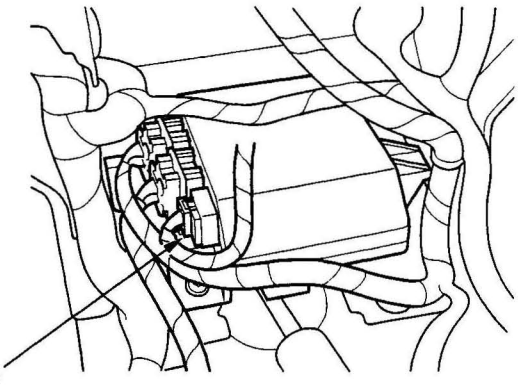


Is the resistance as specified?

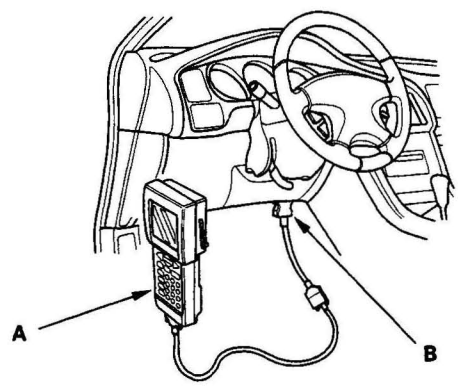
YES – Faulty SRS indicator circuit in the gauge assembly or poor contact at gauge assembly connector C (18P) ; Check the connection. If the connection is OK, replace the gauge assembly. ■

NO – Open in dashboard wire harness A; replace the dashboard wire harness A. ■

42. Disconnect the SRS unit connector C (8P) from the SRS unit.



43. Connect the Honda PGM Tester (A) to the Data Link Connector (16 P) (B), and follow the Tester's prompts in the "SCS" menu (See the Tester's operating manual).



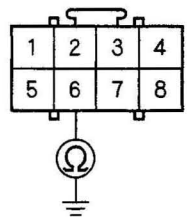
(cont'd)

Protected by AR

SRS Indicator Circuit Troubleshooting (cont'd)

44. Check resistance between the No. 6 terminal of SRS unit connector C (8P) and body ground. There should be 0—1.0 Ω.

SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector C (8P); check the connection. If the connection is OK, replace the SRS unit. ■

NO—Open in the SCS line between the No. 6 terminal of SRS unit connector C (8P) and the No. 9 terminal (BRN wire) of the Data Link Connector (DLC) (16P), or open between the No. 4 terminal of the Data Link Connector (DLC) (16P) and body ground. Repair the open wire(s). ■

BACK

Protected by AR

'02-03 Models

The SRS Indicators, But No DTCs are Stored (NEC SRS unit only)

NOTE: If not already done, check for DTCs using the SCSmenu method before you begin.

1. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds, and then goes off.

   Does the SRS indicator stay on?

   YES – Go to step 2.

   NO – Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-32).

2. Check for blown No. 1 (15 A) fuse in the driver's under-dash fuse/relay box.

   Is the fuse OK?

   YES – Go to step 10.

   NO – Go to step 3.

3. Replace the fuse. Turn the ignition switch ON (II), and check that the fuse doesn't blow.

   Is the fuse OK?

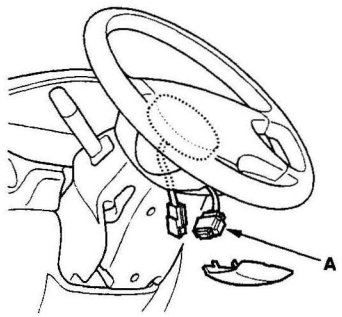
   YES – The problem has disappeared. Test-drive the vehicle and see Troubleshooting Intermittent failures (see page 23-32).■

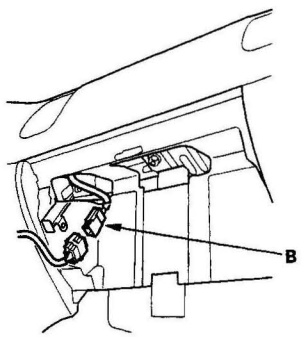
   NO – Go to step 4.

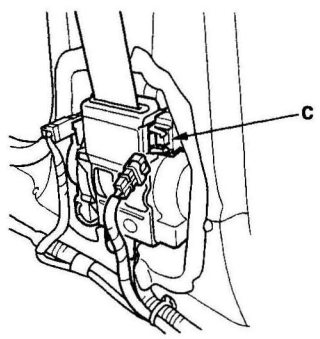
4. Turn the ignition switch OFF.

5. Disconnect the battery negative cable, and wait for 3 minutes.

6. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and both seat belt tensioner connectors (C).





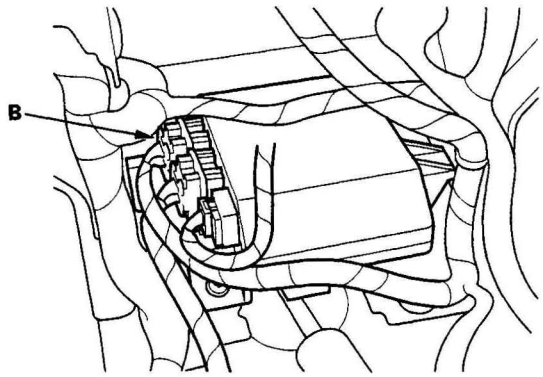


(cont'd)

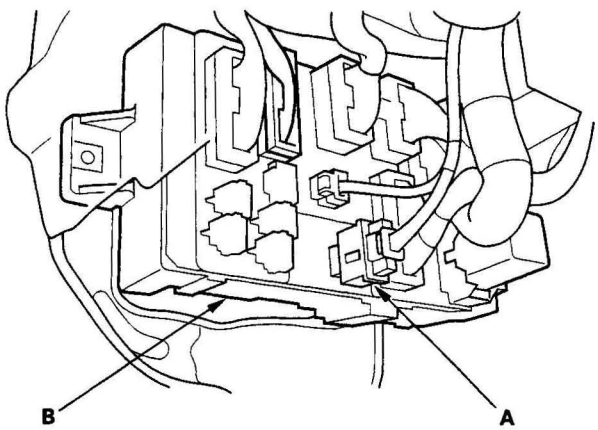
Protected by AR

SRS Indicator Circuit Troubleshooting (cont'd)

7. Disconnect the SRS unit connector (B) from the SRS unit.

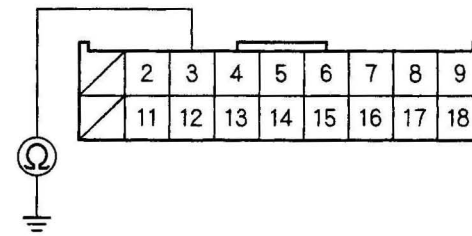


8. Disconnect the SRS main harness 2P connector (A) from the driver's under-dash fuse/relay box (B).



9. Check resistance between the No. 3 terminal of SRS unit connector B (18P) and body ground. There should be an open circuit, or at laast 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Short to ground in No. 1 (15 A) fuse circuit or faulty SRS unit; check the No. 1 (15 A) fuse circuit. If the circuit is OK, replace the SRS unit (see page 23-237).■

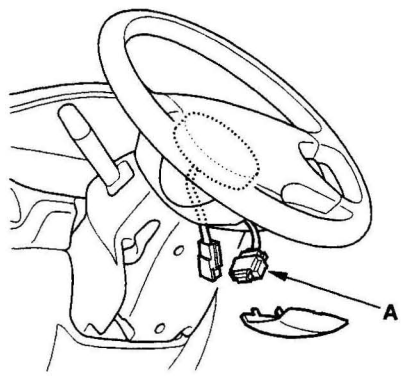
NO—Short to ground in the SRS main harness; replace the harness.■

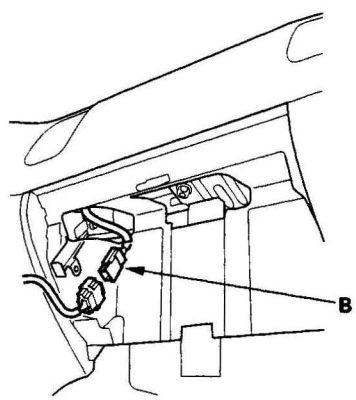
BACK

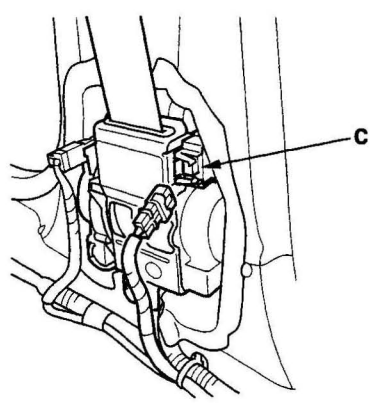
Protected by AR

10. Disconnect the battery negative cable, and wait for 3 minutes.

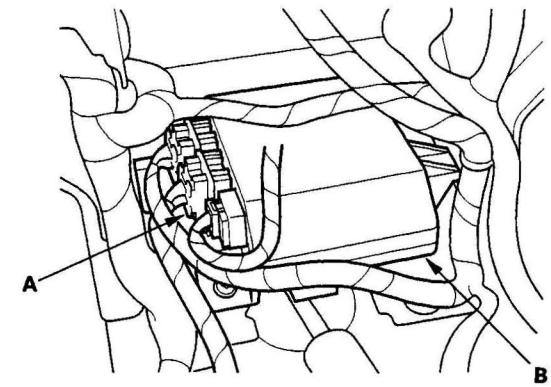
11. Disconnect the driver's airbag connector (A), front passenger's airbag connector (B), and both seat belt tensioner connectors (C).







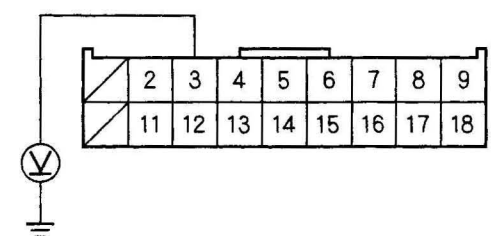
12. Disconnect SRS unit connector (A) (18P) from the SRS unit (B).



13. Reconnect the battery negative cable.

14. Connect a voltmeter between the No. 3 terminal of SRS unit connector A (18P) and body ground.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

15. Turn the ignition switch ON (II), and measure voltage.

Is there battery voltage?

YES – Poor contact at the SRS main harness 18P connector or faulty SRS unit; check the connector. If the connector is OK, replace the SRS unit. ■

NO – Poor contact at the SRS main harness 2P connector or open in the SRS main harness; check the connector. If the connector is OK, replace the SRS main harness. ■

BACK

Protected by AR

Component Replacement/Inspection After Deployment

NOTE: Before doing any SRS repairs, use the PGM Tester SRS menu method to check for DTCs; refer to the DTC Troubleshooting Index for the less obvious deployed parts (seat belt tensioners, OPDS sensor, side airbag sensors, etc.)

After a collision where the seat belt tensioners deployed ('02-03 Models), replace these items:
- Seat belt tensioners
- SRS unit

After a collision where the front airbag(s) deployed, replace these items:
- SRS unit
- Deployed airbag(s)
- Seat belt tensioners ('02-03 Models)

After a collision where the side airbag(s) deployed, replace these items:
- SRS unit
- Deployed side airbag(s)
- Side impact sensor(s) for the side(s) that deployed

During the repair process, inspect these areas:
- Inspect all the SRS wire harnesses. Replace, don't repair, any damaged harnesses.
- Inspect the cable reel for heat damage. If there is any damage, replace the cable reel.

After the vehicle is completely repaired, turn the ignition switch ON(II). If the SRS indicator comes on for about 6 seconds and then goes off, the SRS airbag system is OK. If the indicator does not function properly, use the PGM Tester SRS Menu Method to read the DTC (see page 23-28). If this doesn't retrieve any codes, use the Tester's SCS menu method (see page 23-29). If you still cannot retrieve a code, go to SRS Indicator Circuit Troubleshooting.

BACK

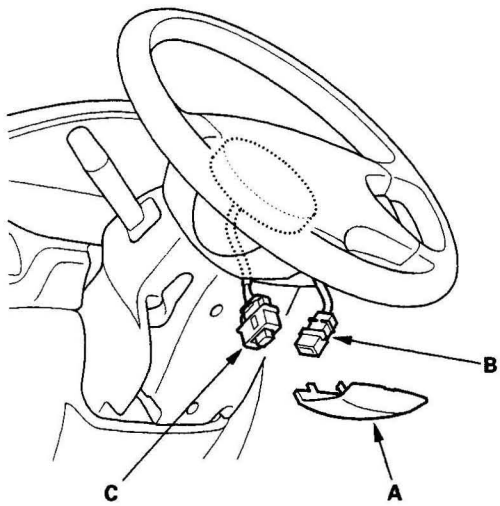
Protected by AR

Driver's Airbag Replacement

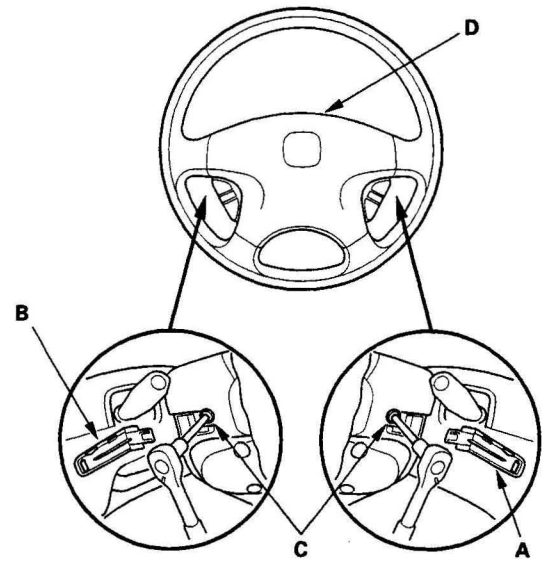
Removal

1. Disconnect the battery negative cable and wait at least 3 minutes before beginning work.

2. Remove the access panel (A) from the steering wheel, then disconnect the connector between the cable reel 2P ('99-01 Models) or 4P ('02-03 Models) connector (B) and driver's airbag 2P ('99-01 Models) or 4P ('02-03 Models) connector (C).



3. Remove the covers (A, B) from the steering wheel, then remove the two Torx bolts (C) using a Torx T30 bit. Then remove the driver's airbag (D).



4. Disconnect the horn connector from the steering wheel.

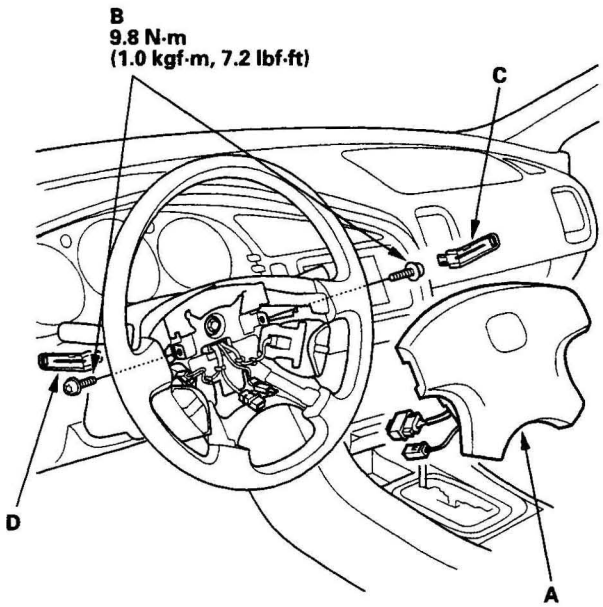
(cont'd)

Protected by AR

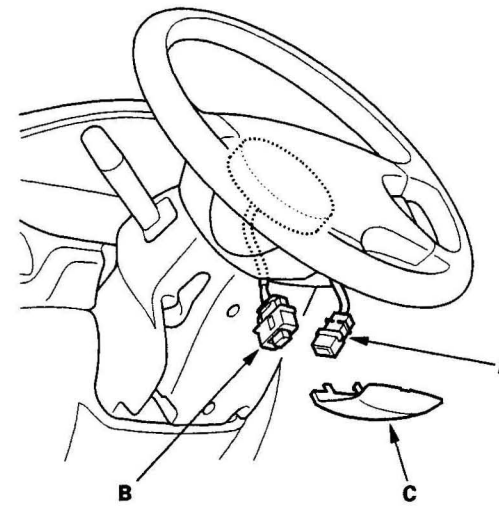
Driver's Airbag Replacement (cont'd)

Installation

1. Place the new driver's airbag (A) in the steering wheel, and secure it with new Torx bolts (B). Install the covers (C and D).



2. Connect the cable reel 2P ('99-01 Models) or 4P ('02-03 Models) connector (A) to the driver's airbag 2P ('99-01 Models) or 4P ('02-03 Models) connector (B), then install the access panel (C) on the steering wheel.



3. Connect the battery negative cable.

4. After installing the airbag, confirm proper system operation:

   - Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.
   - Make sure the horn button works.

5. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

BACK

Protected by AR

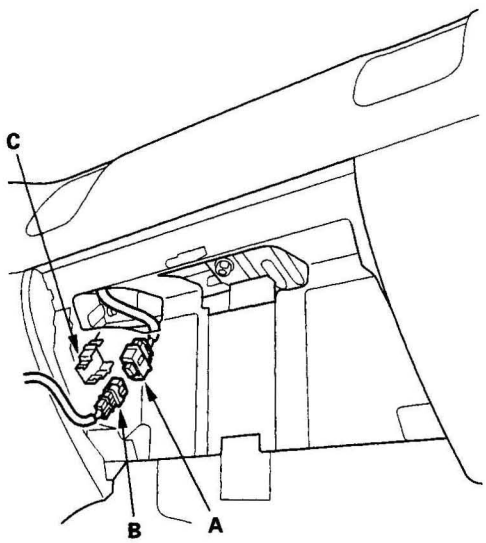
Front Passenger's Airbag Replacement

Removal

1. Disconnect the battery negative cable and wait at least 3 minutes before beginning work.

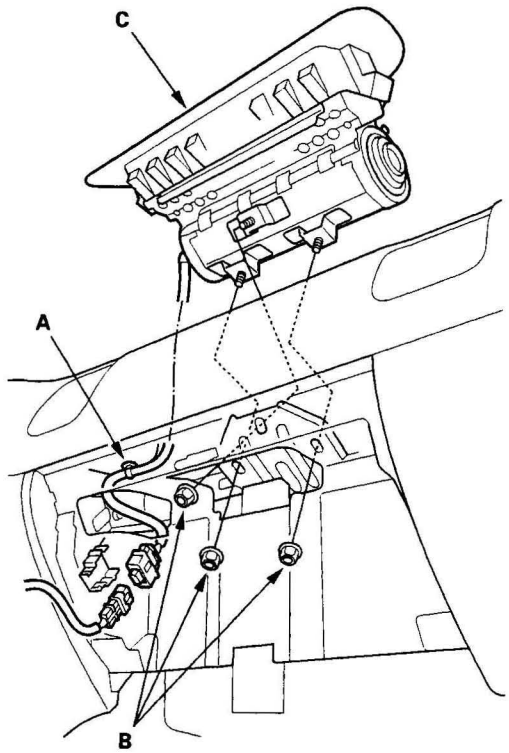
2. Remove the glove box (see page 20-66).

3. Remove the front passenger's airbag connector (A) from the holder (C), then disconnect the connector between the front passenger's airbag 2P ('99 Model) or 4P ('00-03 Models) connector (A) and SRS main harness 2P('99 Model) or 4P ('00-03 Models) connector (B).



4. Remove the harness clamp (A) and the three mounting nuts (B) from the bracket. Cover the lid and dashboard with a cloth, and pry carefully with a screwdriver to lift the front passenger's airbag (C) out of the dashboard.

   NOTE: The airbag lid has pawls on its side which attach it to the dashboard.



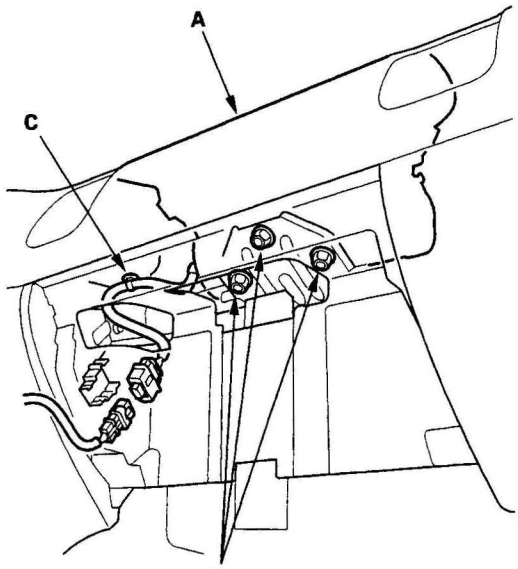
(cont'd)

Protected by AR

Front Passenger's Airbag Replacement (cont'd)

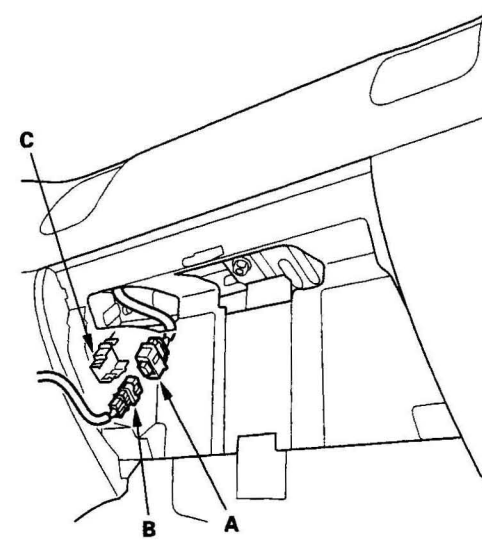
Installation

1. Place the new front passenger's airbag (A) into the dashboard. Tighten the front passenger's airbag mounting nuts (B), and install the harness clamp (C).



9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

2. Connect the front passenger's airbag 2P ('99 Model) or 4P ('00-03 Models) connector (A) to the SRS main harness 2P ('99 Model) or 4P ('00-03 Models) connector (B).
   Attach the front passenger's airbag connector to the connector holder (C), then reinstall the glove box.



3. Reconnect the battery negative cable.

4. After installing the airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.

5. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

BACK

Protected by AR

Side Airbag Replacement

NOTE: Review the seat replacement procedure in the body section (see page 20-78) before performing repair or service.

Removal

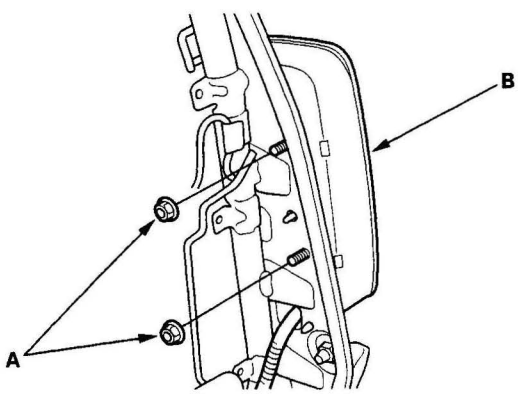
1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.

2. Disconnect the side airbag harness 2P connector (A).



3. Remove the seat assembly (see page 20-78) and seat-back cover.

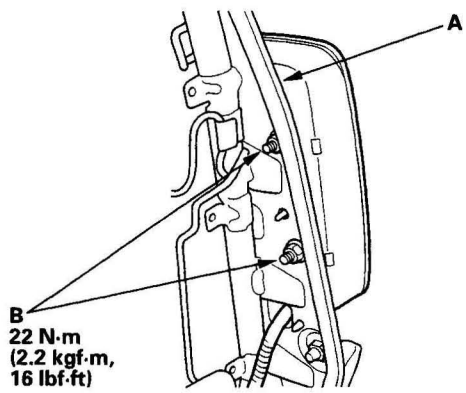
4. Remove the two mounting nuts (A) and the side airbag (B).



Installation

NOTE:
- If the side airbag lid is secured by a tape, remove the tape.
- Do not open the lid of the side airbag cover.
- Use new mounting nuts tightened to the specified torque when you replace a side airbag.
- Make sure that the seat-back cover is installed properly. Improper installation may prevent proper deployment.
- Be sure to install the harness wires so that they are not pinched or interfering with other parts.

1. Place the new side airbag on the seat back-frame (A). Tighten the side airbag mounting nuts (B).



2. Install the new seat-back cover.

3. Install the seat assembly (see page 20-78), then connect the side airbag harness 2P connector.

4. Move the front seat and the seat-back through their full ranges of movement, making sure the harness wires are not pinched or interfering with other parts.

5. Reconnect the battery negative cable.

6. After installing the side airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.

Protected by AR

Airbag Disposal

'99 Model

Special Tool Required
Deployment Tool 07HAZ-SG00500

Before scrapping any airbags (including those in a whole vehicle to be scrapped), the airbags must be deployed. If the vehicle is still within the warranty period, the Acura Parts and Service Manager must give approval and/or special instructions before you deploy the airbags. Only after the airbags have been deployed (as the result of vehicle collision, for example), can they be scrapped. If the airbags appear intact (not deployed), treat them with extreme caution. Follow this procedure:

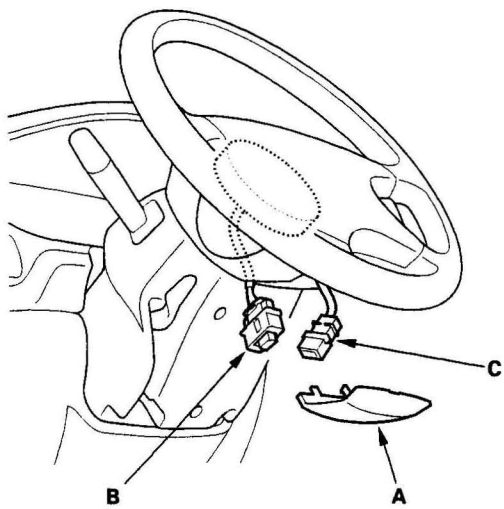
Deploying Airbags In the Vehicle

If an SRS equipped vehicle is to be entirely scrapped, its airbags should be deployed while still in the vehicle. The airbags should not be considered as salvageable parts and should never be installed in another vehicle.

1. Turn the ignition switch OFF, and disconnect the battery negative cable and wait at least 3 minutes.
2. Confirm that each airbag is securely mounted.
3. Confirm that the special tool is functioning properly by following the check procedure on the tool label.

Driver's Airbag:

4. Remove the access panel (A), then disconnect the 2P connector between the driver's airbag (B) and the cable reel (C).

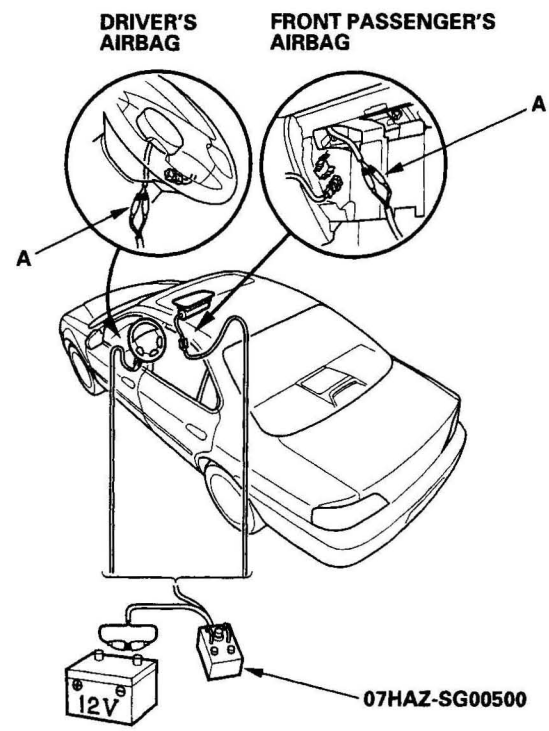


Front Passenger's Airbag:

5. Remove the glove box, then disconnect the 2P connector between the front passenger's airbag (A) and SRS main harness (B).



6. Cut off the airbag connector, strip the ends of the airbag wires, and connect the deployment tool alligator clips (A) to the airbag. Place the deployment tool at least 30 feet (10 meters) away from the airbag.



BACK

Protected by AR

7. Connect a 12 volt battery to the tool.

   - If the green light on the tool comes on, the airbag igniter circuit is defective and cannot deploy the airbag. Go to Disposal of Damaged Airbag.
   - If the red light on the tool comes on, the airbag is ready to be deployed.

8. Push the tool's deployment switch. The airbag should deploy (deployment is both highly audible and visible: a loud noise and rapid inflation of the bag, followed by slow deflation).

   - If the airbags deploy and the green light on the tool comes on, continue with this procedure.
   - If an airbag doesn't deploy, yet the green light comes ON, its igniter is defective. Go to Disposal of Damaged Airbag.
   - During deployment the airbag can become hot enough to burn you. Wait 30 minutes after deployment before touching the airbag.

9. Dispose of the complete airbag. No part of it can be reused. Place it in a sturdy plastic bag (A), and seal it securely.



Special Tool Required
Deployment tool 07HAZ-SG00500

'00-01 Models

Before scrapping any airbags or side airbags (including those in a whole vehicle to be scrapped), the airbags or side airbags must be deployed. If the vehicle is still within the warranty period, the Acura Parts and Service Manager must give approval and/or special instruction before deploying the airbags or side airbags. Only after the airbags or side airbags have been deployed (as the result of vehicle collision, for example), can they be scrapped.
If the airbags or side airbags appear intact (not deployed), treat them with extreme caution. Follow this procedure.

Deploying Airbags In the Vehicle

If an SRS equipped vehicle is to be entirely scrapped, its airbags or side airbags should be deployed while still in the vehicle. The airbags or side airbags should not be considered as salvageable parts and should never be installed in another vehicle.

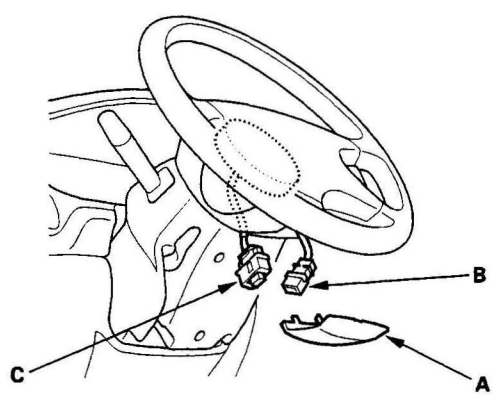
1. Turn the ignition switch OFF, and disconnect the battery negative cable and wait at least 3 minutes.

2. Confirm that each airbag or side airbag are securely mounted.

3. Confirm that the special tool is functioning properly by following the check procedure on the tool label.

Driver's Airbag:

4. Remove the access panel (A), then disconnect the 2P connector between the driver's airbag (B) and the cable reel (C).



(cont'd)

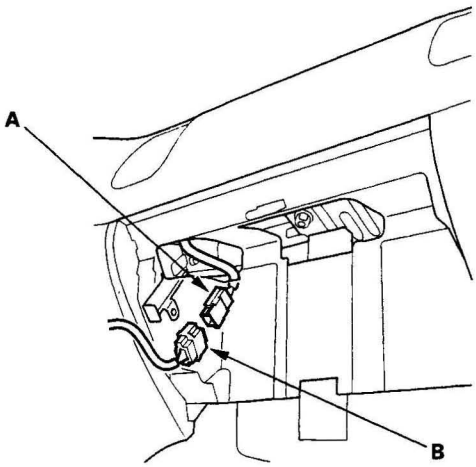
BACK

Protected by AR

Airbag Disposal (cont'd)

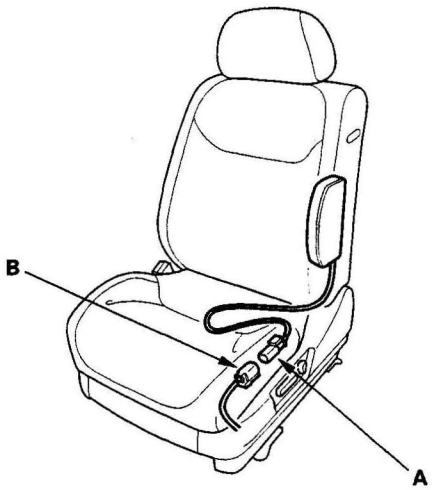
Front Passenger's Airbag:

5. Remove the glove box, then disconnect the 4P connector between the front passenger's airbag (A) and SRS main harness (B).



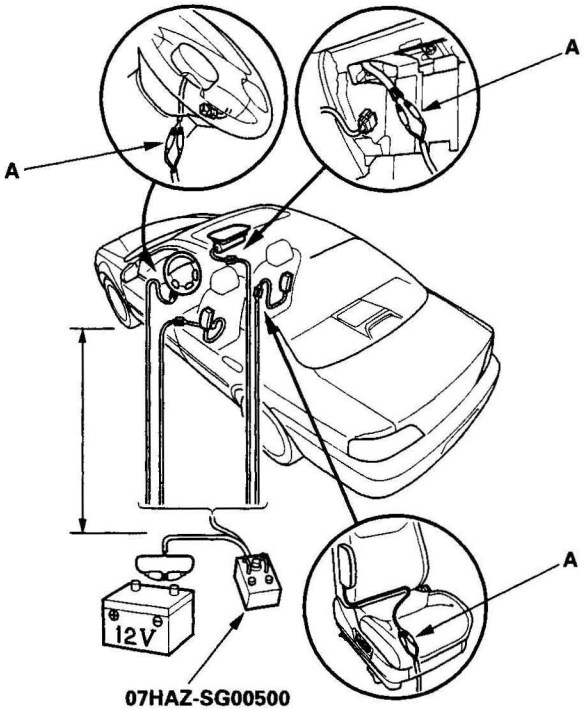
Side Airbag:

6. Disconnect the 2P connector between the side airbag (A) and the SRS floor harness (B) or side wire harness (B).



7. Cut off the airbag connector, strip the ends of the airbag wires, and connect the deployment tool alligator clips (A) to the airbag. Place the deployment tool at least 30 feet (10 meters) away from the airbag.

   NOTE: The front passenger's airbag has four wires, two yellow and two red. Twist each pair of unlike colored wires together, and connect an alligator clip to each pair.



BACK

Protected by AR

8. Connect a 12 volt battery to the tool.

   - If the green light on the tool comes on, the airbag igniter circuit is defective and cannot deploy the airbag. Go to Damaged Airbag Special Procedure.
   - If the red light on the tool comes on, the airbag is ready to be deployed.

9. Push the tool's deployment switch. The airbag should deploy (deployment is both highly audible and visible: a loud noise and rapid inflation of the bag, followed by slow deflation).

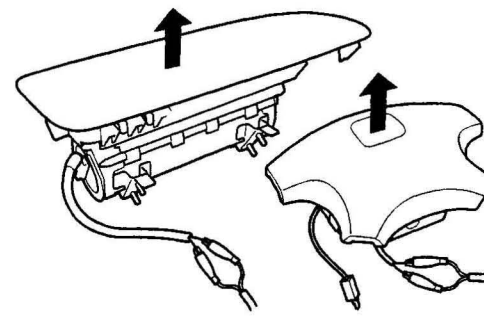
   - If the airbags deploy and the green light on the tool comes on, continue with this procedure.
   - If an airbag doesn't deploy, yet the green light comes ON, its igniter is defective. Go to Damaged Airbag Special Procedure.
   - During deployment the airbag can become hot enough to burn you. Wait 30 minutes after deployment before touching the airbag.

10. Dispose of the complete airbag. No part of it can be reused. Place it in a sturdy plastic bag (A), and seal it securely.



Deploying the Airbags Out of the Vehicle

If an intact airbag has been removed from a scrapped vehicle, or has been found defective or damaged during transit, storage or service, it should be deployed as follows:



1. Confirm that the special tool is functioning properly by following the check procedure on this page or on the tool label.

2. Position the airbag face up, outdoors on flat ground at least 30 feet (10 meters) from any obstacles or people.

3. Follow steps 6, 7, 8, and 9 or 7, 8, 9 and 10 of the in-vehicle deployment procedure.

Disposal of Damaged Airbag

1. If installed in a vehicle, follow the removal procedure for the driver's airbag (see page 23-219), front passenger's airbag (see page 23-221), and side airbag (see page 23-223).
2. In all cases, make a short circuit by twisting together the two airbag inflator wires.
3. Package the airbag in exactly the same packaging that the new replacement part come in.
4. Mark the outside of the box "DAMAGED AIRBAG NOT DEPLOYED" "DAMAGED SIDE AIRBAG NOT DEPLOYED" so it does not get confused with your parts stock.
5. Contact your Acura Parts and Service Manager for how and where to return it for disposal.

Deployment Tool Check

1. Connect the yellow clips to both switch protector handles on the tool; connect the tool to a battery.
2. Push the operation switch: green means the tool is OK; red means the tool is faulty.
3. Disconnect the battery and the yellow clips.

Protected by AR

Airbag Disposal (cont'd)

'02-03 Models
Special Tool Required
Deployment tool 07HAZ-SG00500

Before scrapping any airbags, side airbags, or seat belt tensioners (including those in a whole vehicle to be scrapped), the airbags, side airbags, or seat belt tensioners must be deployed. If the vehicle is still within the warranty period, the Acura Parts and Service Manager must give approval and/or special instruction before deploying the airbags, side airbags, or seat belt tensioners. Only after the airbags, side airbags, or seat belt tensioners have been deployed (as the result of vehicle collision, for example), can they be scrapped. If the airbags, side airbags, or seat belt tensioners appear intact (not deployed), treat them with extreme caution. Follow this procedure.

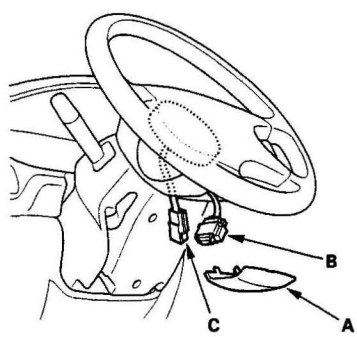
Deploying Airbags In the Vehicle

If an SRS equipped vehicle is to be entirely scrapped, its airbags, side airbags, or seat belt tensioners should be deployed while still in the vehicle. The airbags, side airbags, or seat belt tensioners should not be considered as salvageable parts and should never be installed in another vehicle.

1. Turn the ignition switch OFF, then disconnect the battery negative cable, and wait at least 3 minutes.
2. Confirm that each airbag, side airbag, or seat belt tensioner is securely mounted.
3. Confirm that the special tool is functioning properly by following the check procedure on the tool label.

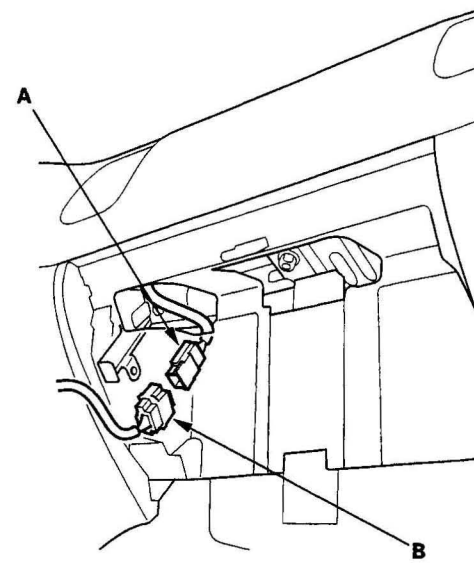
Driver's Airbag:

4. Remove the access panel (A), then disconnect the 4P connector between the driver's airbag (B) and the cable reel (C).



Front Passenger's Airbag:

5. Remove the glove box, then disconnect the 4P connector between the front passenger's airbag (A) and the SRS main harness (B).



Side Airbag:

6. Disconnect the 2P connector between the side airbag (A) and the SRS floor harness (B).

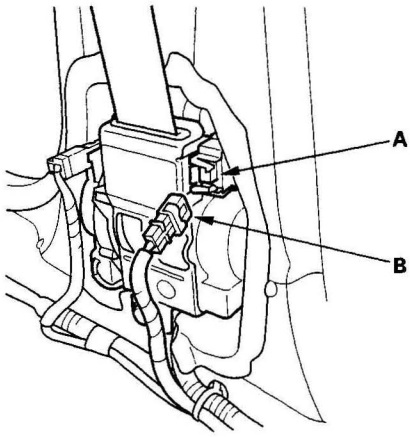


BACK

Protected by AR

Seat belt tensioner:

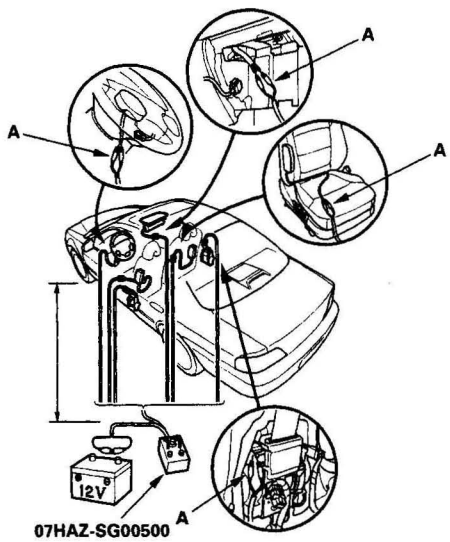
7. Disconnect the 2P connector between the seat belt tensioner (A) and side wire harness (B).



8. Pull the seat belt out all the way and cut it.

9. Cut off the airbag connector, strip the ends of the airbag wires, and connect the deployment tool alligator clips (A) to the airbag wires. Place the deployment tool at least 30 feet (10 meters) away from the airbag.

   NOTE: The driver's and front passenger's airbags have four wires each, two green and two white. Twist each pair of unlike color wires together and connect one alligator clip to each pair.



10. Connect a 12 volt battery to the tool.

    - If the green light on the tool comes on, the airbag igniter circuit is defective and cannot deploy the airbag. Go to Disposal of Damaged Airbag.
    - If the red light on the tool comes on, the airbag is ready to be deployed.

11. Push the tool's deployment switch. The airbag should deploy (deployment is both highly audible and visible: a loud noise and rapid inflation of the bag, followed by slow deflation).

    - If the airbag deploys and the green light on the tool comes on, continue with this procedure.
    - If an airbag doesn't deploy, yet the green light comes ON, its igniter is defective. Go to Disposal of Damaged Airbag.
    - During deployment, the airbag can become hot enough to burn you. Wait 30 minutes after deployment before touching the airbag.

12. Dispose of the complete airbag. No part of it can be reused. Place it in a sturdy plastic bag (A), and seal it securely.



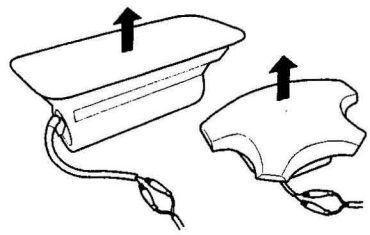
(cont'd)

Protected by AR

Airbag Disposal (cont'd)

Deploying the Airbags Out of the Vehicle

If an intact airbag has been removed from a scrapped vehicle, or has been found defective or damaged during transit, storage, or service, it should be deployed as follows:



1. Confirm that the special tool is functioning properly by following the check procedure on this page or on the tool label.
2. Position the airbag face up, outdoors, on flat ground, at least 30 feet (10 meters) from any obstacles or people.
3. Follow steps 9, 10, 11, and 12 of the in-vehicle deployment procedure.

Disposal of Damaged Airbag

1. If installed in a vehicle, follow the removal procedure for the driver's airbag, front passenger's airbag, side airbag, and seat belt tensioner (see page 23-4).
2. In all cases, make a short circuit by twisting together the two airbag inflator wires.
3. Package the airbag in exactly the same packaging that the new replacement part came in.
4. Mark the outside of the box "DAMAGED AIRBAG NOT DEPLOYED" "DAMAGED SIDE AIRBAG NOT DEPLOYED" "DAMAGED SEAT BELT TENSIONER NOT DEPLOYED" so it does not get confused with your parts stock.
5. Contact your Acura Parts and Service Manager for how and where to return it for disposal.

Deployment Tool Check

1. Connect the yellow clips to both switch protector handles on the tool; connect the tool to a battery.
2. Push the operation switch: green means the tool is OK; red means the tool is faulty.
3. Disconnect the battery and the yellow clips.

BACK

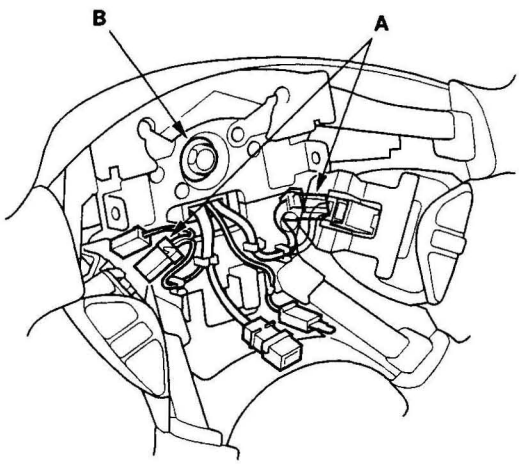
Protected by AR

Cable Reel Replacement

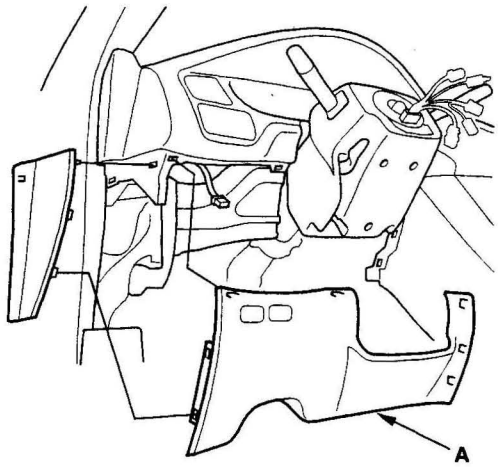
'99-01 Models

Removal

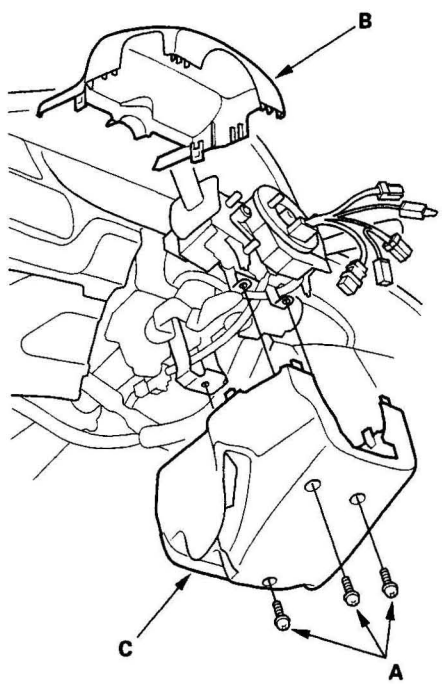
1. Make sure the wheels are aligned straight ahead.
2. Disconnect the battery negative cable and wait at least 3 minutes.
3. Remove the driver's airbag (see page 23-219).
4. Disconnect the connectors (A) from the radio remote switch, cruise control set/resume switch, then remove the steering wheel bolt (B).



5. Align the front wheels straight ahead, then remove the steering wheel (see page 17-24).
6. Remove the dashboard lower cover (A).



7. Remove the column cover screws (A), then remove the column covers (B, C).

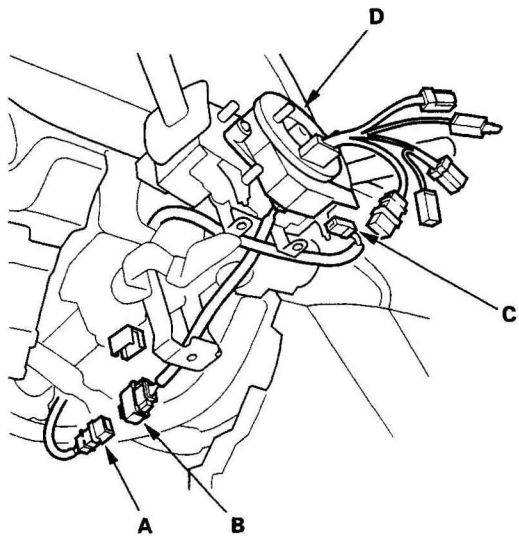


(cont'd)

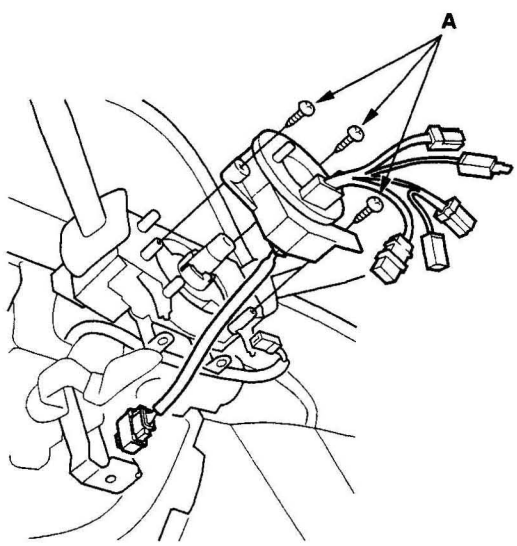
Protected by AR

Cable Reel Replacement (cont'd)

8. Disconnect the SRS main harness 2P connector (A) from the cable reel 2P connector (B), then disconnect the dashboard harness 4P connector (C) from the cable reel (D).

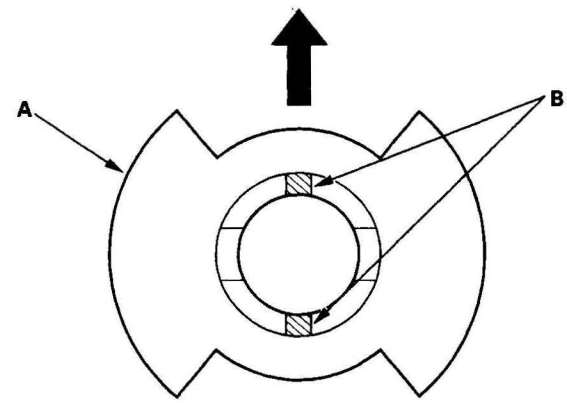


9. Remove the screws (A) from the cable reel, then remove the cable reel from the column.

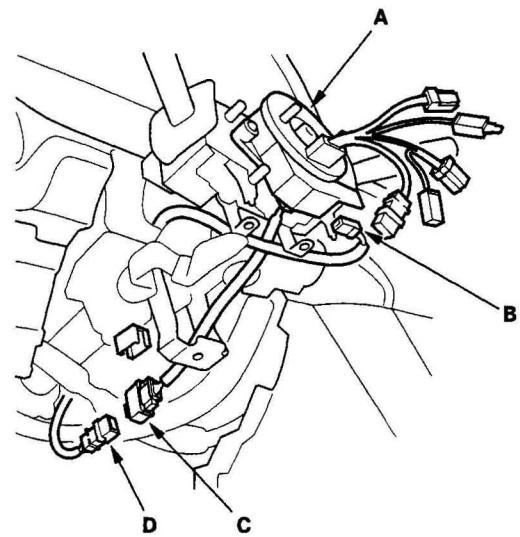


Installation

1. Align the front wheels straight ahead.
2. If not already done, disconnect the battery negative cable, and wait at least 3 minutes.
3. Set the cancel sleeve (A) so that the projections (B) are aligned vertically.



4. Carefully install the cable reel (A) on the steering column shaft. Then connect the 4P connector (B) to the cable reel, and connect the 2P connector (C) to the SRS main harness 2P connector (D).

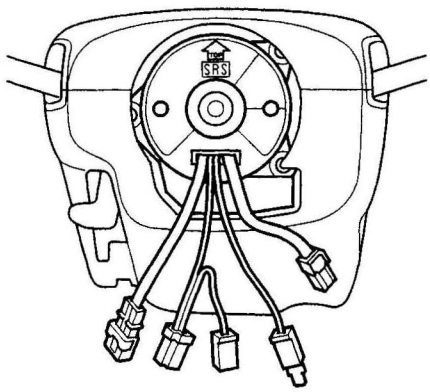


BACK

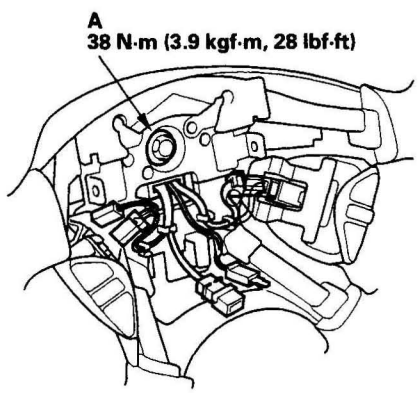
Protected by AR

5. Install the steering column covers.

6. If necessary, center the cable reel. (New replacement cable reels come centered.) Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise (about 2 1/2 turns) until the arrow mark on the cable reel label points straight up.



7. Align the projections on the cable reel with the holes on the steering wheel, and install the steering wheel with a new steering wheel bolt (A).



8. Install the driver's air bag (see page 23-220).

9. Reconnect the battery negative cable.

10. After installing the cable reel, confirm proper system operation:

    - Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.
    - After the SRS indicator has turned off, turn the steering wheel fully left and right to confirm the SRS indicator does not come on.
    - Make sure the horn button works.

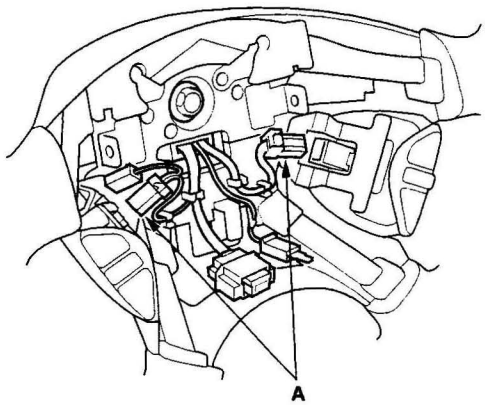
Protected by AR

Cable Reel Replacement (cont'd)

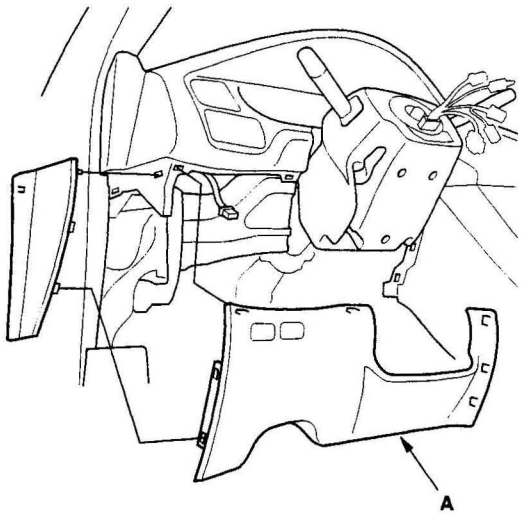
'02-03 Models

Removal

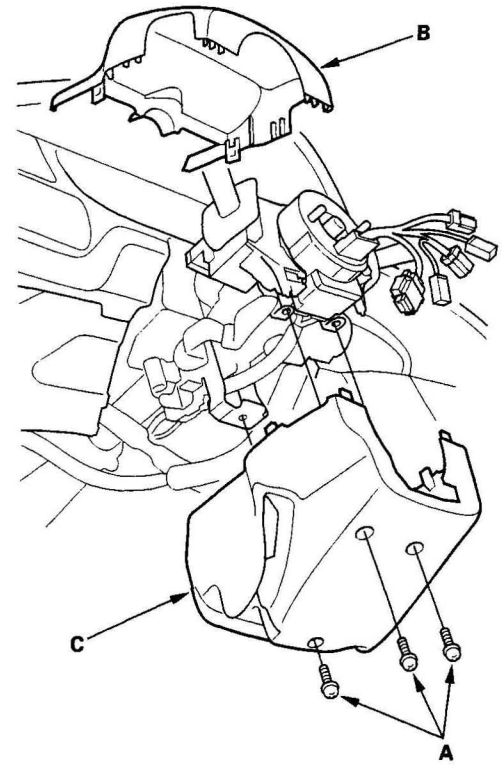
1. Make sure the wheels are aligned straight ahead.
2. Disconnect the battery negative cable, and wait at least 3 minutes.
3. Remove the driver's airbag.
4. Disconnect the connectors (A) from the cruise control set/resume switch and radio remote switch, then remove the steering wheel bolt (B).



5. Align the front wheels straight ahead, then remove the steering wheel (see page 17-24).
6. Remove the dashboard lower cover (A).



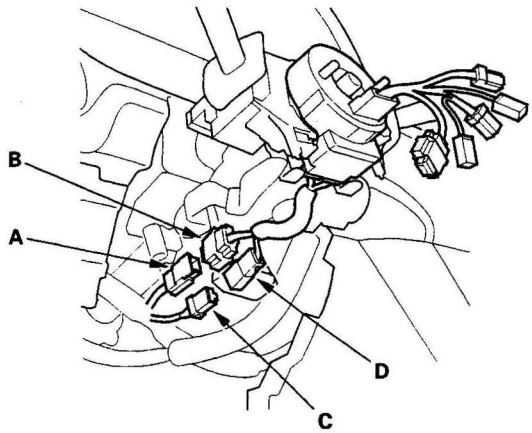
7. Remove the column cover screws (A), then remove the column covers (B, C).



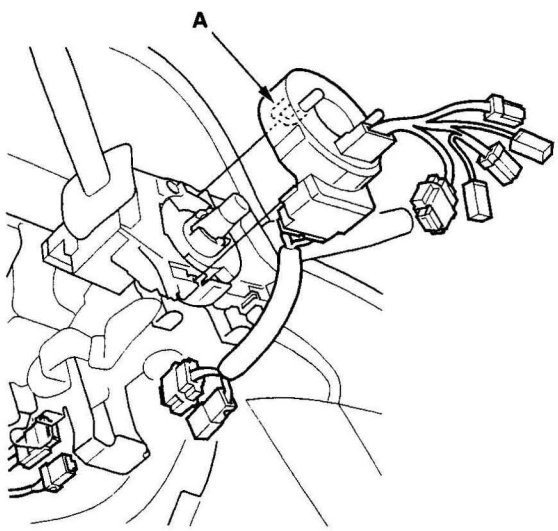
BACK

Protected by AR

8. Disconnect the SRS main harness 4P connector (A) from the cable reel 4P connector (B), and the dashboard wire harness B 4P connector (C) from the cable reel 4P connector (D).

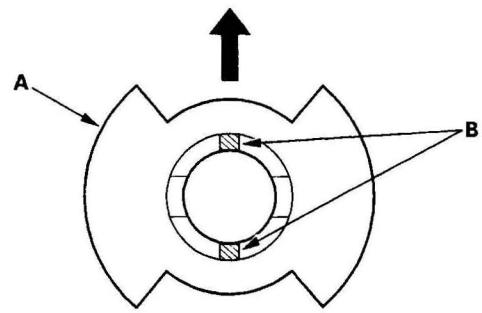


9. Remove the tab (A), then remove the cable reel from the column.

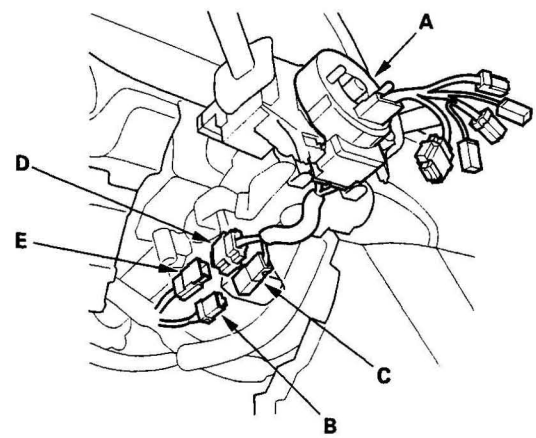


Installation

1. Align the front wheels straight ahead.
2. If not already done, disconnect the battery negative cable, and wait at least 3 minutes.
3. Set the cancel sleeve (A) so that the projections (B) are aligned vertically.



4. Carefully install the cable reel (A) on the steering column shaft. Then connect the dashboard wire harness B 4P connector (B) to the cable reel 4P connector (C), and connect the cable reel connector (D) to the SRS main harness 4P connector (E).



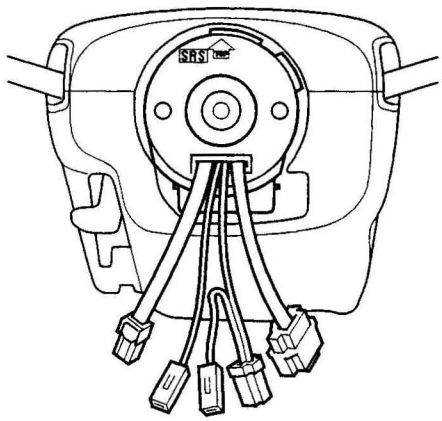
(cont'd)

Protected by AR

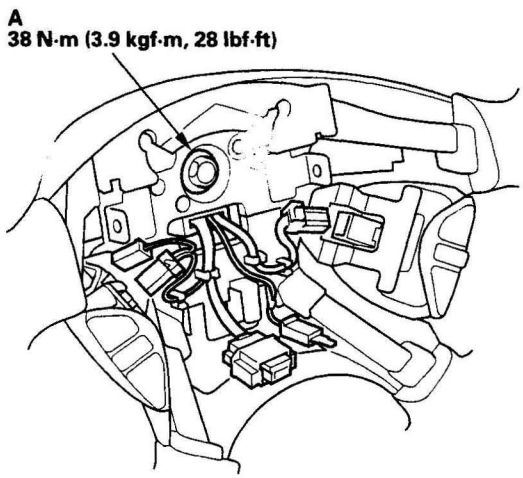
Cable Reel Replacement (cont'd)

5. Install the steering column covers.

6. If necessary, center the cable reel. (New replacement cable reels come centered.) Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise (approximately 2 1/2 turns) until the arrow mark on the cable reel label points straight up.



7. Align the projections on the cable reel with the holes on the steering wheel, and install the steering wheel with a new steering wheel bolt (A).



8. Install the driver's airbag.

9. Reconnect the battery negative cable.

10. After installing the cable reel, confirm proper system operation:

    - Turn the ignition switch ON (II); the SRS indicator light should come on for about 6 seconds and then go off.
    - After the SRS indicator has turned off, turn the steering wheel fully left and right to confirm the SRS indicator does not come on.
    - Make sure both horn buttons work.

BACK

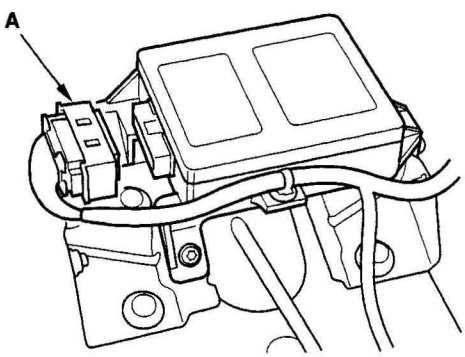
Protected by AR

SRS Unit Replacement

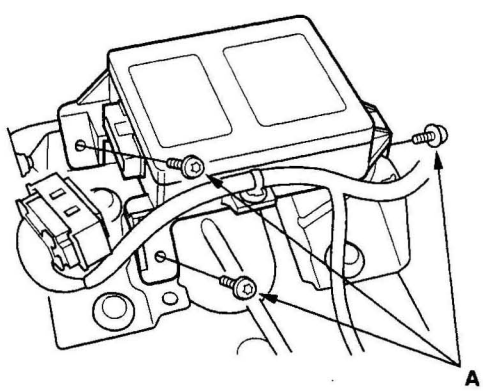
'99 Model

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the airbag connectors.
3. Remove the console panel (see page 20-63).
4. Disconnect the SRS main harness 18P connector (A) from the SRS unit.



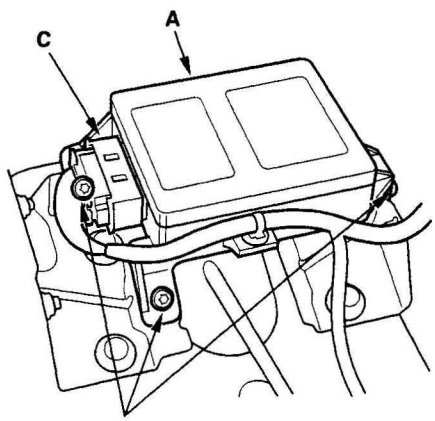
5. Remove the three Torx bolts (A) from the SRS unit, then pull out the SRS unit from the bracket.



Installation

1. Install the new SRS unit (A) with new Torx bolts (B), then connect the SRS main harness 18P connector (C) to the SRS unit, and push them into place until they click.

   NOTE:
   - When tightening the Torx bolts to the specified torque after replacement, be careful to turn them in so that their heads rest squarely on the brackets.
   - Secure the SRS unit with new Torx bolts. Torx bolts cannot be reused because they are treated with special parts.



2. Install the console panel.
3. Reconnect the airbag connectors.
4. Reconnect the battery negative cable.
5. After installing the SRS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

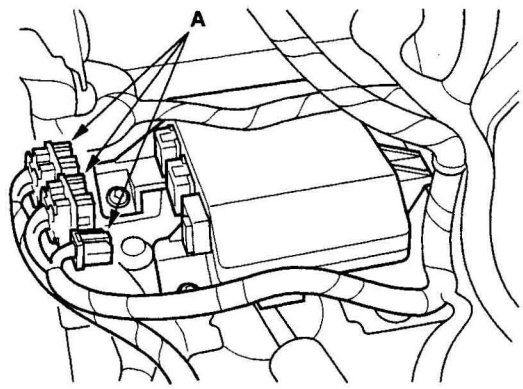
Protected by AR

SRS Unit Replacement (cont'd)

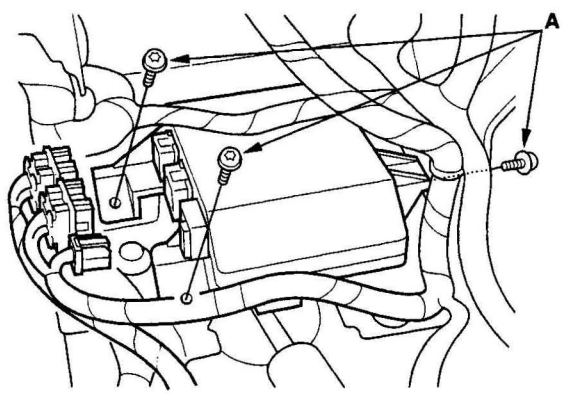
'00-03 Models

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work (see page 23-17).
2. Disconnect the airbag connectors (see page 23-25).
3. Disconnect the side airbag connectors (see page 23-25).
4. Remove the console panel (see page 20-63).
5. Disconnect the connectors (A) from the SRS unit.



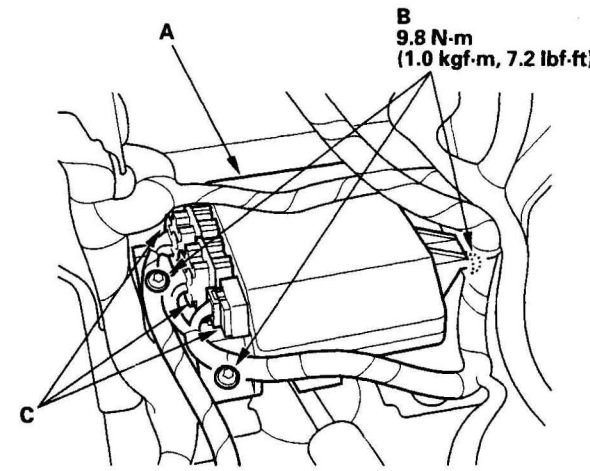
6. Remove the three Torx bolts (A) from the SRS unit, than pull out the SRS unit from the bracket.



Installation

1. Install the new SRS unit (A) with Torx bolts (B), then connect the connectors (C) to the SRS unit, and push them into place until they click.

   NOTE:
   - When tightening the Torx bolts to the specified torque after replacement, be careful to turn them in so that their heads rest squarely on the brackets.



2. Install the console panel (see page 20-63).
3. Reconnect the airbag connectors (see page 23-25).
4. Reconnect the side airbag connectors (see page 23-25).
5. Reconnect the battery negative cable.
6. Initialize the OPDS unit (see page 23-23).
   NOTE: Initialization is only needed if you installed a new SRS unint.
7. After installing the SRS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

BACK

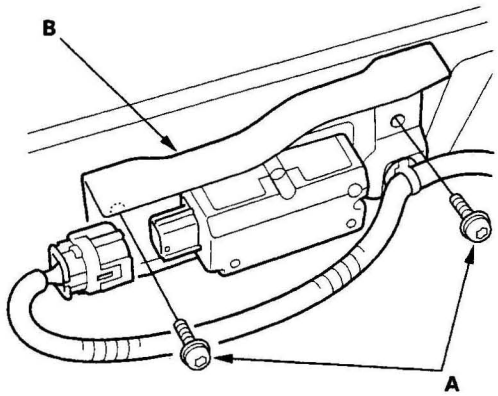
Protected by AR

Side Impact Sensor Replacement

Removal

NOTE:
- Removal of the side impact sensor must be performed according to the precautions/procedures described previously.
- Before disconnecting the side impact sensor 4P connector(s), disconnect the side airbag 2P connector(s).
- Do not turn the ignition switch ON (II) and do not connect the battery cable while replacing the side impact sensor.

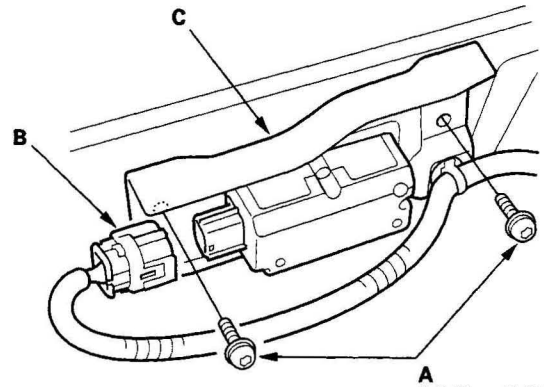
1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the seat assembly (see page 20-78).
3. Remove the front door sill trim (see page 20-55).
4. Remove the center pillar lower trim panel (see page 20-55).
5. Remove the lower anchor bolt (see page 23-4).
6. Turn up the carpet (A), then disconnect the SRS floor harness 4P connector from the side impact sensor.
7. Remove the two Torx bolts (A) using a Torx T30 bit, then remove the side impact sensor (B).



Installation

NOTE:
- Be sure to install the harness wires so they are not pinched or interfering with other parts.
- Do not turn the ignition switch ON (II) and do not connect the battery cable while replacing the side impact sensor.

1. Install the new side impact sensor with Torx bolts (A) then connect SRS floor harness 4P connector (B) to the side impact sensor (C).
2. Reinstall the plate.



3. Reconnect the battery negative cable.
4. After installing the side impact sensor, confirm proper system operation: Turn the ignition switch ON (II): the SRS indicator should come on for about 6 seconds and then go off.

Protected by AR

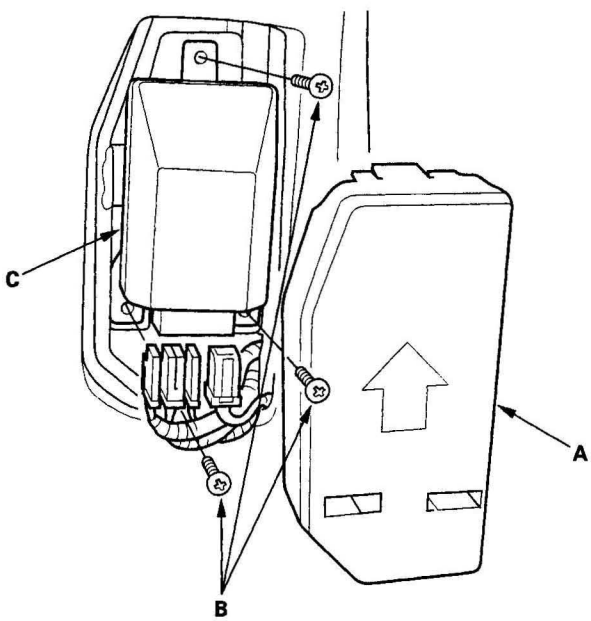
OPDS Unit Replacement

'00-03 Models

NOTE: Review the seats replacement procedure in the body section (see page 20-78) before doing repairs or service.

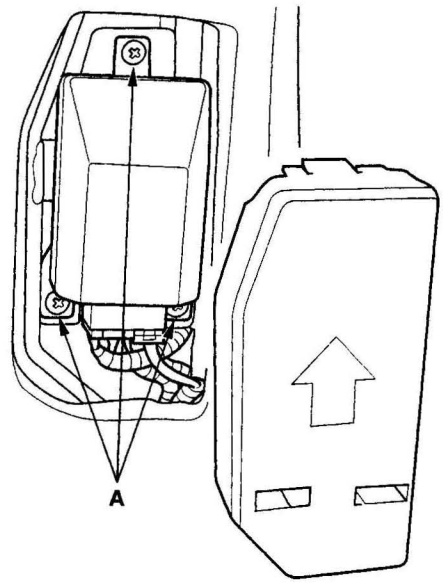
Removal

1. Disconnect the negative battery cable, and wait at least 3 minutes before beginning work.
2. Disconnect the side airbag harness 2P connector (see page 23-25).
3. Remove the seat assembly (see page 20-78) and seat-back cover (see page 20-78).
4. Remove the cover (A), then disconnect the OPDS unit harness 8P and sensor connectors from the OPDS unit.
5. Remove the three screws (B) and OPDS unit (C).



Installation

1. Place the new OPDS unit on the seat-back frame. Tighten the three screws (A), then connect the OPDS unit harness 8P and sensor connectors to the OPDS unit. Reinstall the cover.



2. Install the new seat-back cover (see page 20-90).
3. Install the seat assembly (see page 20-78), then connect the side airbag harness 2P connector.
4. Reconnect the battery negative cable.
5. Set the seat-back in the normal position, and make sure there is nothing sitting on the front passenger's seat.
6. Initialize the OPDS unit (see page 23-33).
7. After installing the OPDS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

BACK